Factors influencing the effectiveness of a Cooperative Planning approach in the school setting

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Abstract

The purpose of the Health.edu project was to develop, implement and evaluate effective and feasible measures addressing students' health-related knowledge and understanding (HKU) in physical education (PE) with a specific focus on a co-creation approach (Cooperative Planning). The general procedure was identical in the four intervention schools involved; however, effectiveness (i.e. an increase in HKU) differed. Therefore, the present study investigated how different contextual factors supported or hindered the Cooperative Planning approach (evaluation of program implementation). To consider different perspectives in the analysis, we used data triangulation. On the one hand, written protocols (N=19) document relevant statements and decisions in each planning group meeting (scientific perspective). On the other hand, we captured the participating PE teachers' (N=8) individual attitudes after the Cooperative Planning process through semi-structured interviews (teachers' perspective). Data were analysed via qualitative content analysis. We identified three relevant factors with influence on the Cooperative Planning approach. First, the Cooperative Planning intervention worked if teachers saw a benefit in providing evidence-based knowledge, reflected their teaching practices and made an effort to implement new teaching strategies. Second, it was beneficial to have students represented as partners in the decision-making process. Third, support from the principal appeared to be helpful but not mandatory for implementing progressive pedagogical concepts. Continuous monitoring and reflection on those factors by the leading project team might help facilitate subsequent interventions using Cooperative Planning.

Key words: health promotion, physical literacy, health-related knowledge and understanding, participatory research, implementation science, qualitative analysis

INTRODUCTION AND THEORETICAL BACKGROUND

Schools are regarded as ideal settings for promoting children's health as they represent a crucial component of children's living environment (Lewallen et al., 2015). As an 'on-going setting, where health is created' (St Leger, 2004), they offer favourable resources and opportunities to implement health promotion programs. However, to be successful, health promotion at school must be linked directly to the school's educational goals (Turunen et al., 2017). Thus, considering physical education (PE), a focus on health outcomes through fitness training alone is insufficient to achieve the wide range of possible educational effects of PE for school-age children. Instead, many
Effectiveness of a Cooperative Planning approach in the school setting

Authors emphasize the importance of providing young people with the knowledge, skills and understanding necessary to perform various physical activities healthily and maintain healthy lifestyles (Gard and Wright, 2001; Bailey et al., 2009; Kirk, 2013; McCuaig et al., 2013; Brandl-Bredenbeck and Sygusch, 2017; Ptack and Tittelbach, 2018). In that sense, students should acquire profound knowledge and understanding of not only the principles of movement and performance but also of the requirements, antecedents and value of participating in a physically active lifestyle (Whitehead, 2013; Edwards et al., 2017). On the one hand, students should know about and be able to apply basic training principles such as specificity (linking training to personal goals) and progressive overload (a gradual increase of training intensity). On the other hand, they should know about and be able to modify personal antecedents of physical activity such as strengthening motivation via establishing personal, relevant goals and finding personal, joyful activities. The correspondent development of knowledge and understanding in relation to health (also referred to as health-related knowledge and understanding; Strobl et al., 2020) is an essential requirement to facilitate students making healthy choices for physical activity with its accompanying positive health benefits (Ennis, 2015; Lundvall, 2015; Cale and Harris, 2018; Töpfer, 2019). To effectively target health-related knowledge and understanding (HKU) in PE, student-centred teaching/learning processes are recommended (Kirk, 2013; Hodges and Hodges Kulinna, 2014; Lundvall, 2015). Those processes focus on higher-order thinking and learner participation, combining the delivery of health-related knowledge with experiences through physical activity. That means teachers arrange problem-based learning situations in the field of physical activity that have to be solved by their students (e.g. based on previously provided knowledge, students have to organize and supervise a training circuit for the training of specific muscle groups). In this manner, student-centred teaching strategies represent a prerequisite to strengthening students’ HKU (Pommier et al., 2010).

As the quality of teaching that students receive is understood to play a significant role in student learning, teachers should be empowered to help students learn the subject matter (Toh et al., 2007; Kim et al., 2018). However, training teachers in applying student-centred teaching strategies, implementation studies in the school setting have often shown little acceptance of traditional top-down approaches (Bartelink et al., 2018). Instead, there is evidence that co-creation (Leask et al., 2019), that is, co-production of desired outcomes taking the setting into account (Rütt en et al., 2019), is a more effective solution to strengthen the implementation process and thus school-based health promotion. Co-creation can be described as an intensive collaboration of relevant members of a setting (e.g. teachers, principal and students in the school setting) on an equal footing with a scientific research team (Leask et al., 2019). Such a partnership can enhance knowledge and competencies concerning evidence-based and feasible health-promoting measures among all involved stakeholders (Hawe, 2000). Furthermore, participation of all stakeholders in discussions and decision-making may enhance the identification of all participants with the actions taken and increase the chances of sustainable implementation within that setting (Brownson et al., 2009). To realize co-creation in health promotion interventions, Cooperative Planning has been shown a useful approach (Rütten and Gelius, 2013; Frahsa et al., 2014; Rütten et al., 2019). Cooperative Planning integrates all relevant stakeholders of a setting (concerning the current study of the school setting) and fosters shared and equal decision-making in a systematic process. Researchers usually are responsible for facilitating, structuring and moderating the Cooperative Planning meetings, following a standardized interaction scheme. They are further in charge of providing the scientific evidence concerning the contents discussed. Based on the scientific evidence, all planning group members share decision-making about goal-setting, implementation procedures, selection of research methods and use of findings (Frahsa et al., 2014).

To summarize, a co-creation approach in the school setting seems promising to develop and implement effective and feasible student-centred teaching strategies to enhance HKU in PE. This was the aim of the Health.edu project (Sygusch et al., 2021), as part of the research consortium Capital4Health (Rütten et al., 2019). Capital4Health targets to improve capabilities for an active lifestyle of different population groups (e.g. infants, students, trainees and older adults) via a co-creation strategy, using the Cooperative Planning approach. Health.edu specifically focused on secondary schools. For evaluation of program effectiveness (for details, see Strobl et al., 2020), the development of students’ HKU in the intervention schools was compared with four control schools, which carried out their regular PE lessons. Results showed an overall significant effect of the Health.edu program on students’ HKU with a medium effect size (Strobl et al., 2020). However, despite experiencing an identical procedure within the Cooperative Planning group meetings, there were considerable differences between the involved intervention schools. Some schools showed substantial increases in students’ HKU with large effect sizes (Cohen’s d), while others did not. Because of these differences, we were challenged to investigate the reasons for that. Which processes were at play...
during the program’s implementation that helped to understand the differences in the effectiveness of the intervention between schools (Pommier et al., 2010; Darlington et al., 2018)? This question is particularly relevant in an intervention using a co-creation approach, where the implementation of specific measures depends on the stakeholders involved and cannot be set beforehand. Accordingly, this paper’s study objective is to investigate the Cooperative Planning process thoroughly: (i) Did implementation of the Cooperative Planning process occur as planned by the scientific project team? (ii) How did participate PE teachers perceive the Cooperative Planning process? (iii) Considering those two perspectives, is it possible to identify a set of relevant overarching factors, which apparently influenced the Cooperative Planning process and, subsequently, the effectiveness of the intervention?

METHODS
Study design
The current study is a sub-study of the overarching Health.edu project (Sygusch et al., 2021). Health.edu focused on secondary schools and followed a quasi-experimental pre-/post-test design with four intervention and four control schools. The intervention consisted of a 1-year Cooperative Planning process in the intervention schools in the school year 2015/2016, intending to enable students to make healthy choices regarding physical activity by strengthening their HKU. Study evaluation comprised evaluation of program effectiveness and evaluation of program implementation with measurements at the beginning (pre-Cooperative Planning process) and the end (post-Cooperative Planning process) of the school year, using a mixed-methods approach (see Figure 1). The current sub-study presents results from the evaluation of program implementation, using qualitative data from the four intervention schools (protocols of the Cooperative Planning groups and information from the stimulated recall interviews after the Cooperative Planning process).

Participants
Recruitment of four intervention schools occurred by contacting several school principals via email, phone or in-person. To account for similar socio-economic characteristics, we recruited schools in the same administrative district in Bavaria, Germany. Schools were selected if principals voluntarily declared their readiness for participation. Having found four intervention schools, we stopped the recruitment process. In each of the four intervention schools (A, B, C and D), two PE teachers (one female and one male respectively; in total \( n = 8 \)) participated with one of their PE classes voluntarily in the study (see Table 1). Every PE teacher further identified two or three students to participate voluntarily in the Cooperative Planning process. Ethical approval was obtained from the data security official of the University of Erlangen-Nuremberg and the Bavarian State Ministry for Education and Cultural Affairs (reference number X.7-BO4106/459/8). Parents and teachers provided written informed consent; all students provided written informed consent to participate in the study.

Intervention
The central component of the intervention was the Cooperative Planning process. The procedure for the single planning group meetings was identical in each intervention school involved (see Table 2). We carried out five meetings over one academic year in each school A, B and C. In school D, we aggregated the meetings four and five because of scheduling problems (i.e. in total, we hold four meetings in school D).

Within the planning group meetings, relevant stakeholders (PE teachers, students, principals and scientists) collaboratively developed student-centred teaching strategies to enhance HKU in PE. The named student-centred teaching strategies involved ‘cognitive activation’ (e.g. asking students for known warm-up exercises and discussing their relevance to the following sports activities); ‘reflection’ (e.g. reflecting on the effects of High-Intensity-Training on heart rate and subjective exhaustion); ‘relevance of everyday life’ (such as fitness training for a forthcoming ski course); and ‘collaborative learning’ (e.g. providing information on a muscle-building training circuit and instructing the students to organize single circuit stations). While scientists brought in evidence-based knowledge about student-centred teaching strategies and took leadership in prioritizing topics, PE teachers adapted the student-centred teaching strategies to their own PE lessons and discussed feasibility. Students also discussed the feasibility and made remarks concerning the usefulness and attractiveness of the chosen contents. Principals discussed feasibility, school prerequisites and facilitation factors and provided internal and external support. The PE teachers further implemented the developed teaching strategies in their PE lessons. They reflected on their experiences afterward with their students and the other stakeholders in the Cooperative Planning meetings.

Measurement instruments
To analyse the implementation of the Cooperative Planning process, we needed to get a comparative
Therefore, we used the Cooperative Planning process protocols: a trained student assistant (not directly involved in the research project) documented relevant statements and decisions in each planning group meeting via written documentary technique. These protocols \((n=19)\) document the goals of the meetings, discussion processes and results and tasks for the next meeting. They further assess the active involvement of the different stakeholders within the Cooperative Planning process and their relationship with each other.

Additionally, we needed to understand the not directly visible perspectives of the participating PE teachers on the Cooperative Planning process. They were the persons in charge of implementing the planned PE lessons and could report their experiences with the whole process. Therefore, we captured the participating PE teachers’ \((n=8);\) see Table 1 \) individual perspectives after the Cooperative Planning (post-Cooperative Planning process) through semi-structured interviews. For example, we asked the teachers about their experiences with the developed and implemented student-centred teaching strategies and what they recognized as supportive, respectively hindering during the Cooperative Planning process.

### Data analysis
To consider results from protocols as well as interviews in the analysis, we used data triangulation. After the verbatim transcription of the interviews, both protocols and interviews were analysed based on thematic qualitative content analysis (Pope et al., 2000; Mayring, 2015) using MAXQDA 12 software. To provide rigor and quality of the analysis, we documented the process in detail, especially attaching importance to inter-subjective comprehensibility (Tuckett, 2005). In a first step, we inductively defined categories by condensing relevant text passages of the material. The corresponding coding guide further emerged by several ‘rework’ loops and revisions with regard to definitions, anchor examples and coding rules. After creating the coding guide, selected research members of the Health.edu project discussed and revised the coding guide based on the emerging categories, the context of the intervention and the methodological approach (Tuckett, 2005). In the following, two researchers independently encoded

### Table 1: Overview of intervention schools and involved PE teachers and classes

| School | PE teachers* | Students** |
|--------|--------------|------------|
| A      | Haylie, female, 37 Grade 10, female, \(n=22\) |   |
|        | Luke, male, 29 Grade 7, male, \(n=15\) |   |
| B      | Isabel, female, 28 Grade 9, female, \(n=15\) |   |
|        | Milo, male, 38 Grade 10, male, \(n=18\) |   |
| C      | Jill, female, 59 Grade 10, female, \(n=22\) |   |
|        | Noah, male, 58 Grade 10, male, \(n=24\) |   |
| D      | Kimberly, female, 36 Grade 8, female, \(n=11\) |   |
|        | Oliver, male, 53 Grade 8, male, \(n=14\) |   |

*Names represent pseudonyms.

**In Germany (especially in Bavaria, the region where the study took place), it is common that in grades 7–10, female teachers only teach female students and male teachers only teach male students.
approximately 25% of randomly selected contributions to the material (intercoder-reliability of 93%) employing the new coding guide.

RESULTS

The final coding guide for the evaluation of program implementation consists of three essential factors influencing the Cooperative Planning process:

• **Shared beliefs**: The extent to which PE teachers and scientists share a holistic and salutogenic understanding of health and put effort into implementing student-centred teaching strategies for improving students’ health-related knowledge and understanding (HKU).

• **Participation of relevant stakeholders**: The extent to which relevant stakeholders (PE teachers, students, principals and scientists) participate in discussions and decision-making about what teaching strategies will be implemented and how.

• **Principal’s support and appreciation**: The extent to which principals actively support and appreciate the engagement of the involved PE teachers.

The qualitative content analysis showed some substantial differences regarding those factors among the intervention schools involved. Therefore, in the following, results are presented separately for each school. Pseudonyms have been used for participating PE teachers to ensure the given data’s anonymity (see Table 1).

**Intervention school A**

PE teachers shared the holistic and salutogenic views on health with the scientists and put a lot of effort into implementing student-centred teaching strategies.

‘I want to teach students tools so that they have the competence to keep their bodies healthy themselves’ (Haylie).

‘The students should understand their actions and not only feel the effects on the body but should also be able to explain and know how to make their body healthy again’ (Luke).

All relevant stakeholders (PE teachers, students, principal and scientists) in this school A attended the meetings regularly and reflected PE teachers’ ideas for what teaching strategies would be implemented and how.

‘The principal doesn’t have much time, but she always made it to the meetings. But I imagine there are a lot of schools where the principals walk by and leave early’ (Haylie).

Furthermore, the principal supported the Cooperative Planning process by regularly contributing her vision of progressive classes. She also repeatedly encouraged PE teachers and involved students in sharing their thoughts. Moreover, she reduced the extraordinary professional duties of the PE teachers (e.g. relieving them from standing in for colleagues on sick leave).

‘Above all, the principal was at the meetings, listened to discussions and wanted to actively promote the fact that something is being developed here’ (Haylie).
Intervention school B

Comparable to school A, PE teachers at school B shared the holistic and salutogenic views on health with the scientists and put a lot of effort into implementing student-centred teaching strategies.

‘For me, being health-related competent means that a student knows what he can do to keep himself healthy’ (Milo).

’It is essential to pick up the thread. I came in with a question. The girls should reflect why it is so important for them and why it is essential for their muscles’ (Isabel).

Like at school A, PE teachers, students and scientists regularly attended the meetings and reflected PE teachers’ ideas for what teaching strategies would be implemented and how. Only the school’s principal missed the meetings twice.

‘I believe that the students really liked the implemented lessons. The girls were involved in the planning process and had a say in what I teach, so it certainly has a high level of acceptance among the girls’ (Isabel).

Nevertheless, school B’s principal supported the Cooperative Planning process by regularly praising the PE teachers’ work in general school meetings among the other teaching staff.

‘We have great support from the principal because he knows the importance of the project and is happy to support the activities and help us there. That is really an important thing’ (Isabel).

Intervention school C

In school C, the two PE teachers had a pathogenic (i.e. disease-oriented) view about (students’) health with a focus on risk factors and therefore concentrated their lessons on health outcomes like endurance and strength. Consequently, they saw no benefit in implementing student-centred teaching strategies.

‘Well, there are some students who hang for a minute on the bar, and others fall off after three seconds. If you do not perform any push-ups for years and do not let them do them, you will notice what is missing. This is a logical conclusion: The students can only be as good as you make them fit’ (Jill).

The school’s principal missed the meetings once. The students only attended three out of five meetings and were not considered equal partners in the decision-making process.

‘I do not think that the students enriched the discussions with their comments’ (Noah).

Despite regularly attending the Cooperative Planning meetings, the principal of school C acted reserved and valued other school projects more.

“Well, we have the impression that it was really quite different from the project on the topic of nanotechnology. It was all much more important; everyone knew about it. The parents knew everything, were informed. The fact that there is now also something going on in PE, that’s all been lost’ (Noah).

Intervention school D

PE teachers in school D recognized the relevance of student-centred teaching strategies for improving HKU. However, they mainly concentrated on the cognitive activation of their students by providing workbooks and additional homework. Still, they struggled with implementing strategies aimed at more significant involvement of the students during PE lessons.

‘Well, I thought if I still have time, then I could talk to the students about it, but that was not the case. The more time you give the students independently, the more time you actually lack to get through your things’ (Kimberly).

The students and the principal only attended half of the meetings, and the students, in particular, were not considered equal partners in the decision-making process.

‘So, I think for the students, it was certainly sometimes a bit abstract; they didn’t understand much of the terminology and didn’t even know what we were talking about’ (Oliver).

School D’s principal did not support the process actively.

‘We do not have the feeling that the principal appreciated our efforts’ (Kimberly).

Summarizing the results, the following Table 3 shows a qualitative rating of the extent to which the identified factors were present in the single intervention schools.

DISCUSSION

The evaluation of the program effectiveness of the Health.edu project (Strobl et al., 2020) showed that despite experiencing an identical procedure involving Cooperative Planning group meetings, there were considerable differences in effects between the four intervention schools involved. Therefore, the current study aimed to identify relevant factors during the implementation process, which help explain the diverse development of
students’ HKU among the participating intervention schools. The focus of the analysis was on the Cooperative Planning process as a core component of the intervention. Cooperative Planning is a suitable measure for enabling PE teachers to implement evidence-based student-centred teaching strategies in their PE lessons. This approach is successful due to a co-creation approach (Leask et al., 2019; Rütt en et al., 2019) between relevant stakeholders in the school setting. Based on the inductive qualitative analysis of the planning group meetings’ protocols and the semi-structured interviews with the PE teachers, we gained relevant insights regarding our study objectives articulated in the introduction. First, implementation of the Cooperative Planning process did not occur as planned in all schools. In school C, for example, PE teachers did not share a common understanding of the relevant principles to improve students’ HKU. Accordingly, they did not put a strong effort into the implementation of student-centred teaching strategies. Furthermore, in schools C and D, the principals and selected students only irregularly participated in the meetings and had little influence on decision-making. Second, the perception of the participating PE teachers differed between schools. Especially teachers of school D struggled with implementing student-centred teaching strategies, thus perceiving the Cooperative Planning process as only limited helpful. Moreover, only schools A and B, PE teachers perceived the principals as actively supporting and encouraging the planning process. These principals had a strong interest in progressive teaching, appreciated the PE teachers’ engagement and made the project public within the teaching staff by talking positively about it in general meetings. Third, based on the results presented above, we were able to identify a set of three relevant factors, which influenced the Cooperative Planning process and, subsequently, the effectiveness of the intervention: (i) the extent to which PE teachers and scientists shared a common understanding of the relevant principles to improve students’ HKU; (ii) the extent to which relevant stakeholder of the school setting participated in discussions and decision-making in the Cooperative Planning meetings and (iii) the extent of the principal’s support and appreciation. Students’ HKU increased significantly with large effect size and the most significant absolute values in those schools (A and B; Strobl et al., 2020) with a (very) positive rating in all identified relevant categories. In contrast, the increase of students’ HKU was lowest (nonsignificant, small effect size) in school C (Strobl et al., 2020), where only participation of relevant stakeholders was rated neutral, whereas the other two categories were rated very negatively. Finally, students’ HKU increased significantly with a large effect size in school D (but with a lower absolute increase than in schools A and B; Strobl et al., 2020). This school attained a positive rating concerning shared beliefs, a neutral rating concerning the participation of relevant stakeholders, and a negative rating concerning principals’ support and appreciation (see Table 3).

Evaluation of program effectiveness (Strobl et al., 2020) and program implementation of the Health.edu project clarifies that provision of evidence-based knowledge for the design of effective teaching/learning processes for PE teachers is only one step for improving students’ HKU. A successful co-creation approach within diverse school settings and thus facilitating sustainable changes in the quality of teaching further depend on different contextual factors of relevance to those settings. Accordingly, the current study is in line with findings of implementation research that emphasize the

### Table 3: Rating of factors influencing the effectiveness of the Cooperative Planning process in the four intervention schools

| Factor                            | School A | School B | School C | School D |
|-----------------------------------|----------|----------|----------|----------|
| **Shared beliefs**                | ++       | ++       | − −       | +        |
| The extent to which PE teachers and scientists share a holistic and salutogenic understanding of health and put effort into implementing student-centred teaching strategies for improving students’ health-related knowledge and understanding (HKU). |
| **Participation of relevant stakeholders** | ++       | +        | −        | 0        |
| The extent to which relevant stakeholders (PE teachers, students, principals and scientists) participate in discussions and decision-making about what teaching strategies will be implemented and how. |
| **Principals’ support and appreciation** | ++       | +        | − −       | −        |
| The extent to which principals actively support and encourage the engagement of the involved PE teachers. |

Note: ++ = very positive rating, + = positive rating, 0 = neutral rating, − = negative rating, − − = very negative rating.
influence of numerous contextual factors on the implementation process (Durlak and DuPre, 2008; Fixsen, 2014; Bartelink et al., 2018; Darlington et al., 2018). Considering those factors may enhance the chances for effective implementation, that is, a process for conducting an evidence-based intervention resulting in improved outcomes relevant for health. Some of the relevant contextual factors in the review of Durlak and DuPre (2008) were considered implicitly in the Health.edu project. For example, using the Cooperative Planning approach warranted ‘adaptability’ of the intervention, that is, the extent to which the proposed intervention content is adjustable to fit the preferences and needs of the respective school. Furthermore, the scientific project team supported the schools by managing the overall implementation process through, for instance, setting priorities and establishing consensus in the meetings (leadership).

The three categories identified in the qualitative analysis of the present study further refer to contextual factors relevant to the prevention delivery system (Durlak and DuPre, 2008), that is, the intervention schools involved. As one factor, Durlak and DuPre (Durlak and DuPre, 2008) name the extent to which organizational members are united regarding the value and purpose of the intervention (shared vision)—which is comparable to the category ‘shared beliefs’ in the current study. Students’ HKU increased most in schools where PE teachers saw a benefit of the intervention and were consequently willing to consider student-centred teaching/learning processes in their PE lessons. Accordingly, they were open to reflecting on their current teaching strategies against the provided evidence-based knowledge. This readiness to question own existing practices is regarded as an essential factor influencing the contribution of staff to health education at schools (Jourdan et al., 2010). In contrast, PE teachers of school C took part in the planning group meetings but did not change their teaching practice. Although these two PE teachers collaborated voluntarily and were interested in the intervention content, the Cooperative Planning process did not successfully affect their professional beliefs, which—consciously or unconsciously—play a decisive role in selecting and teaching the subject matter in class (Skott, 2013). One reason could be that these two teachers of school C were older than the other teachers involved were. Therefore, according to their own academic education (Altman, 1983), they directed their PE lessons for most of their professional lives on health outcomes to reduce risk factors (pathogenic view about health), without applying a student-centred approach. They were not willing or able to change their professional beliefs within only one year of Cooperative Planning. Consequently, they did not support the implementation of student-centred teaching strategies in their respective PE classes. Instead, they transferred responsibility to interested students of their classes without taking care of the further implementation process.

The extent to which relevant stakeholders collaborate in determining what will be implemented and how (shared decision-making) represents, according to Durlak and DuPre (2008) as well as Moore et al. (2015), another essential contextual factor influencing intervention implementation. The same issue arose in the current study. The participation of relevant stakeholders in discussions and decision-making differed between schools and was highest in schools with the most significant increases in students’ HKU (schools A and B). Those schools successfully integrated the students into the Cooperative Planning process, increasing students’ satisfaction with the process and their motivation to learn (Griebler et al., 2017).

Finally, the current study revealed school-specific differences concerning the principal’s support and appreciation, a category referring to the factor ‘managerial/supervisory/administrative support’ (i.e. the extent to which executives support and encourage providers during implementation) (Durlak and DuPre, 2008). Research suggests the decisive role of school principals in implementing health promotion activities in the school setting (Roberts et al., 2016) because of their strong influence on teachers, students, parents and organizational conditions. Accordingly, a proactive and supportive principal would be a key consideration for any school-level change. Also, in the Health.edu project, the implementation of the Cooperative Planning groups would not have been possible without the principals’ support. However, the present study adds to these findings in illustrating a minor role of the principal in implementing progressive pedagogical teaching concepts in single PE classes. Despite a lack of the principal’s support in Cooperative Planning groups in school D, students’ HKU in participating classes in school D increased significantly, with a large effect size. Therefore, implementing student-centred teaching strategies to increase students’ HKU seems to depend more on individual teacher’s characteristics than the principal’s support.

**Strengths and limitations**

The current study provides detailed insights into factors influencing the Cooperative Planning process in the school setting. Based on rigorous qualitative analysis of scientists’ and teachers’ perspectives via data triangulation, an explanation of the quantitative measured results of the Health.edu project (Strobl et al., 2020) is possible. However, due to a focus on the Cooperative Planning...
process and the inductive procedure in analysing the data, other factors influencing the implementation process (see Durlak and DuPre, 2008) were not considered systematically in collecting the data. Therefore, we may have missed other critical factors influencing the Cooperative Planning process. Furthermore, the sample consists of only four intervention schools selected based on their willingness and are not representative of the investigated administrative district. Accordingly, the generalizability of the results for other schools is not possible. Nevertheless, randomization criteria may be difficult to achieve within the school setting (Demetriou and Höner, 2012).

CONCLUSION

In summary, the current study contributes to existing implementation research in health promotion in the school setting, with a specific focus on a co-creation approach (Cooperative Planning). The general procedure of the Cooperative Planning group meetings was identical in each school involved; however, effectiveness (i.e. an increase in students’ HKU) differed. Therefore, we investigated the Cooperative Planning process in detail. Based on the qualitative analysis of the protocols of the Cooperative Planning meetings and semi-structured interviews with PE teachers, it was possible to identify three relevant factors influencing the effectiveness of the intervention. First, and most importantly, the Cooperative Planning intervention worked if teachers saw a benefit in the provided evidence-based knowledge, reflected their existing teaching practices and made an effort in implementing new teaching strategies in their lessons. Second, it was beneficial to have students represented as partners in the decision-making process. Third, support from the principal appeared to be helpful but not mandatory for implementing the developed progressive pedagogical concepts. However, if support was existent, work was easier for the teachers involved and therefore triggered long-term efforts by the teachers and, in response, enhanced the sustainability of the intervention. Continuous monitoring and reflection on those factors by the leading project team might help facilitate subsequent interventions using Cooperative Planning in the school setting.

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CONFLICT OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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