

Don't stress out! The stress lab: A learning tool for prospective physical education teachers in the context of studying at university

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Abstract

Physical education teachers face high demands while teaching (e.g., loud noise, inadequate facilities, low status of physical education teachers in the teacher's body). These demands result in stressful teaching situations and subsequent psychological and physiological stress responses. As a consequence, prospective teachers need to start dealing with stressful teaching situations early in their studies and the stress lab gives prospective teachers this opportunity. In the stress lab, interactive videos of stressful physical education teaching situations serve as stressors and prospective teachers are instructed to generate and apply different coping options. They prepare themselves for acting appropriately in upcoming stressful teaching situations. The theory-based and practise-oriented approach of the stress lab is characterized by physiological and psychological measuring methods (e.g., heart rate monitoring, questionnaires) in order to sensitize prospective teachers for symptoms of stress. Future studies are planned to evaluate the effectiveness of the stress lab.

Zusammenfassung

Sportlehrkräfte sind während ihrem Unterricht hohen Anforderungen ausgesetzt (z. B. Lärm, unzureichende Ausstattung, geringer Status der Sportlehrkräfte im Kollegium), die zu stressreichen Unterrichtssituationen und anschließenden psychischen und physiologischen Stressreaktionen führen. Infolgedessen müssen sich angehende Lehrkräfte bereits früh im Studium mit stressreichen Unterrichtssituationen auseinandersetzen. Das Stresslabor bietet angehenden Lehrkräften genau diese Möglichkeit. Im Stresslabor dienen interaktive Videos von stressigen Situationen im Sportunterricht als Stressoren, und angehende Lehrer*innen werden angewiesen, verschiedene Bewältigungsmöglichkeiten zu beschreiben und anzuwenden. Sie bereiten sich darauf vor, in zukünftigen, stressigen Unterrichtssituationen angemessen zu handeln. Der theoriebasierte und praxisorientierte Ansatz des Stresslabors ist durch physiologische und psychologische Messmethoden (z. B. Messen der Herzfrequenz, Fragebögen) gekennzeichnet, um angehende Lehrkräfte für Stresssymptome zu sensibilisieren. Zukünftige Studien sind geplant, um die Wirksamkeit des Stresslabors zu evaluieren.

1 Introduction

Comparisons between occupations show that the teaching profession in general is one of the most stressful occupations (Johnson, 2005; Kyriacou, 2011). Physical education (PE) teachers face particularly high demands given the nature of their subject such as disciplinary problems of the student body and the low status of their profession (Miethling 2007, Miethling & Brand, 2004, Sáenz-López, Almagro, & Ibáñez, 2011). As a consequence, PE teachers often experience high levels of stress (Kastrup, Dornseifer & Kleindienst-Cachay, 2008). Pre-service PE teachers¹ in particular show increased perceived stress compared to PE teachers and PE students (Schäfer, Pels, von Haaren-Mack, & Kleinert, 2019). Therefore, it is very important to prepare prospective PE teachers to deal with stressful situations. The purpose of this manuscript is to describe the stress lab as an interactive learning tool for preparing prospective PE teachers for stressful teaching situations.

Stress occurs through appraisals in the transaction between a person and the environment (Lazarus & Folkman, 1984). In the primary appraisal, the person evaluates a situation as positive, irrelevant or stressful. Stressful appraisals come along with thoughts of harm/loss, threat or challenge. In the secondary appraisal, the person

¹ In Germany, the system of becoming a teacher consists of three parts. First, students enroll in university classes to become a teacher (here: PE students). After successfully completing their degree, they have to complete a 'Referendariat' (here: PE pre-service teachers). 'Referendariat' means two years teaching at schools while being monitored by a skilled teacher. After theoretical and practical exams during the 'Referendariat', they are fully trained teachers (here: PE teachers).

Action phases (Nitsch, 2004)		Anticipation phase	Realisation phase			Interpretation phase
STRESS LAB	Sections	(1) Preparation	(2a) Symptom recognition	(2b) Psychological symptom control	(2c) Psychological symptom control	(3) Reflection
	Educational objectives	How to prepare for upcoming challenging situations in the teaching context.	How to experience, reconstruct and understand the spectrum of stress symptoms during challenging	How to reflect, experience and apply exemplary strategies of psychological symptom control during challenging situations.	How to reflect, experience and apply exemplary strategies of physiological symptom control during challenging situations.	How to reflect on the previous phases (i.e. on the preparation for stress potentials (preparation) and on the dealing with challenging situation (symptom recognition, physiological symptom control)).
	Exemplary task	Each group of five participants should discuss how one can prepare for challenging situations in the teaching context.	One participant of each group should reflect on which symptoms of the physical reaction he/she/ they perceived during the videos.	One participant of each group should apply the strategy focus on the positive during the videos and reflect afterwards how he/she/ they dealt with occurring symptoms.	One participant of each group should apply the strategy	All participants reflect collectively on the physiological reaction (e.g. the Heart rate).

Figure 1: Flow chart of the stress lab. Displayed are the action phases (Nitsch, 2004) and sections of the stress lab with concurring educational objectives and exemplary tasks.

evaluates their available coping options. If their coping options in a stressful situation are low, the person experiences stress. For example, a teacher feels overwhelmed by the loud noise of children during a PE class (primary appraisal) and does not know how to handle the enduring noise (secondary appraisal).

In PE teaching, stressful situations often occur due to a unique set of stressors specific to their job. According to a recent systematic review (von Haaren-Mack, Schäfer, Pels & Kleinert, in press), the three most important sources of stress in PE teachers are (1) the facilities and equipment, (2) the curriculum (i.e., the content of teaching during a school year) and (3) the low status of both PE as a subject and of PE teachers. For younger teachers, being a PE teacher already entails stress potential (Miethling & Brand, 2004).

If a situation is experienced as stressful, coping mechanisms will take place (Lazarus & Folkman, 1984). Coping is described as a "cognitive and behavioural effort to manage external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984, p.141). These efforts can be conceptualized in different ways. For example, when a PE teacher plans the class with the use of the whole gymnasium but can only use half of it during the class. Distinctions in coping can be made between strategies such as focus on positives (e.g., positive reframing: the PE teacher tries to see the situation from a positive point of view such as "Less space means more time for group work fostering social skills."), support coping (e.g., seeking for instrumental support: the PE teachers asks a fellow PE teacher how to deal with these situations), active coping (e.g., planning active steps: the PE teacher edits his plan and plans more students at one working station with additional tasks while waiting for their turn), and evasive coping (e.g., denial: the PE teacher makes no adaptations to the planed class; Knoll, Rieckmann, & Schwarzer, 2005). Research shows that the use of coping strategies is more frequent in PE pre-service teachers compared to PE teachers and to PE students (Schäfer, Pels, von Haaren-Mack, & Kleinert, 2019). In PE pre-service teachers, but also in PE teachers, evasive coping strategies are associated with higher stress, while active coping strategies are associated with less stress and seem to be more beneficial to reduce stress (Schäfer, Pels, von Haaren-Mack, & Kleinert, 2019). Furthermore, it has been shown that knowledge about coping strategies whilst studying to become a PE teacher plays a positive role on health-related risk patterns in pre-service teachers (Weigelt, Lex, Wunsch, Kämpfle & Klingsieck, 2016).

To date, the approach to stress management for teachers is characterized by impar-

ting information about stress without the use of digital material like 'real-life' videos. For example, the program AGIL is a stress prevention program and is generally aimed at coping with stress and promoting health in teachers (Lehr, Koch, & Hillert, 2013). In four basic modules and seven optional add-on modules, participants learn key topics of the program, such as thinkability and recovery (basic modules), as well as mindfulness and social support (additional modules; Lehr, Koch, & Hillert, 2013). This and other conventional programs would benefit from the inclusion of 'real-life' video material and immediate reflection on this material, as we propose here in the stress lab.

Overall, the preparation of prospective PE teachers for stressful teaching situations is of utmost importance. More specifically, prospective PE teachers should learn (1) how to prepare for stressful situations during teaching, (2) how to deal with a stressful situation during teaching once it has occurred, and (3) how to reflect on past stressful teaching situations in order to prepare for future situations. The PE teacher study program represents an adequate opportunity to inform students about the potential sources of stress in schools and give them a glimpse into their work at schools beforehand. In the context of becoming a PE teacher, the use of realistic situations can be an adequate means to do so (König, 2004), for example, with the use of 'real-life' video material of teachers during classes. Drawing on these objectives, we have developed a tool named stress lab.

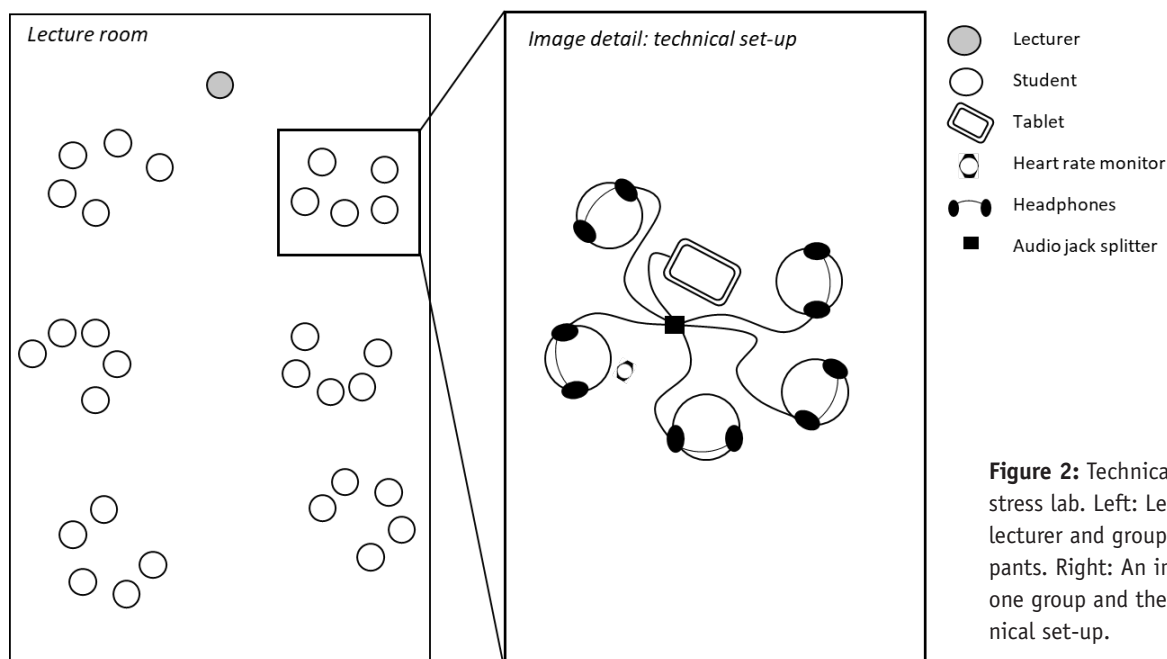


Figure 2: Technical set-up of the stress lab. Left: Lecture room with lecturer and groups of 5 participants. Right: An image detail of one group and the detailed technical set-up.

2 Concept

Structure and educational objectives

The stress lab is a tool for training prospective PE teachers for stressful teaching situations. The core of the stress lab is the immediate confrontation of participants (i.e., the prospective PE teachers) with 'real-life' video material that shows challenging teaching situations (e.g., dealing with loud noise, demonstrating a difficult technique) to which they have to react. The aim of the stress lab is to help participants learn how to manage these and similar future situations.

According to Nitsch's (2004) action theory, any action consists of three phases: (1) anticipation, (2) realisation and (3) interpretation. In line with this theoretical approach, stress-management for stressful situations can also be regarded as triadic. As a consequence, the stress lab is divided into different sections that concur with the triadic action structure (see figure 1). For each section, there are educational objectives that build upon each other. Regarding the 'anticipation phase', the participants learn (1) how to prepare for upcoming challenging situations in the teaching context. Following this, with regard to the 'realisation phase', the participants learn to manage stress during actually challenging situations; in more detail, this comprises to learn (2a) how to experience, reconstruct and understand the spectrum of stress symptoms during challenging situations, (2b) how to reflect, experience and apply exemplary strategies of psychological symptom control during challenging situations and (2c) how to reflect, experience and apply exemplary strategies of physiological symptom control during challenging situations. Finally, in terms of the 'interpretation phase', the par-

ticipants learn (3) how to reflect on the previous phases (i.e., on the preparation for potential stressful situations (preparation) and on the dealing with challenging situations (symptom recognition, psychological and physiological symptom control).

Technical set-up

Participants are divided into groups of five. Each group receives a hardware-set (see figure 2) comprising one tablet, one heart rate monitor, five headphones and one audio jack splitter. The tablet (Samsung® Tab A6) is used to display the video segments of 'real-life' teaching situations to all participants and the participants can hear the audio feature via headphones (Sennheiser® HD 65 TV on-ear headphones). All headphones are connected to an audio jack splitter (SpeaKa® Professional) which is connected to the tablet. In addition, one group member receives a heart rate monitor (Polar® M200 with Polar® H10).

Course of action

Introduction. After a welcome address and a brief introduction to the stress lab by the lecturer, each participant receives a script (i.e., guidelines in which all instructions are written down chronologically) for the stress lab. Subsequently, the groups receive vignettes describing potentially stressful teaching situations (e.g., handling technical issues under time pressure) and representing the content of the subsequent 'real-life' video material. The groups are asked to rate the situations with regard to difficulty, deciding on an order ranging from easy to manage to difficult to manage. The groups will start the 'real-life' video segments in their decided order, starting with the situation they deemed easiest to manage.

Action phases

In line with Nitsch's (2004) action theory and the three action phases, we describe five educational objectives of the stress lab:

(1) Anticipation phase. In order to prepare for teaching situations, the groups deal briefly with the general question of how one can prepare for upcoming challenging situations in the teaching context. Each group discusses their ideas separately and writes down their consensus. The consensus should always be considered when dealing with the tasks in the 'real-life' video segments.

(2) Realisation phase. Within each group, there is one participant who takes on the role of the teacher and four other participants who will be observing and evaluating the performing person. The performing participant alternates between section (2a), (2b) and (2c). In all sections, the observing participants are instructed to focus on the performing participants' body language, facial expression and heart rate.

In each section (2a), (2b) and (2c), two 'real-life' video segments (approx. 2 minutes long) will be presented. The segments include interactive tasks directly related to the 'real-life' material, such as tasks that focus on attention (e.g., "What happened in the background?") or situations that threaten self-worth (e.g., "How do you cope with not being skilled enough to show this technique?") in the teaching context. The headphones ensure a sensory stimulation that enables the participants to get into the teacher's role. To sensitize prospective teachers to the crucial signs of physiological stress and psychological stress, a heart rate monitor (Polar® M200) will be given to the performing participant. In addition, psychological parameters (e.g., affective dimension of arousal via self-assessment manikin (small figures with different emotional expressions, Bradley & Lang, 1994) are completed by the observers.

(2a) Symptom recognition. The participants start the first 'real-life' video segment in their roles of teacher and observer with the focus on symptoms of stress. The observing participants are instructed to answer questions on which they reflect on the performing participant after the video segment in order to focus on the video segment. For example, the observers focus on occurring symptoms of stress in the performing participant. After the video, the performing participant and the observers reflect on the performing participants' behaviour and their thoughts on the spectrum of stress symptoms.

(2b) & (2c) Symptom control. After learning about symptom recognition, the participants will get to focus on symptom control by applying exemplary strategies of (2b) psychological symptom control and (2c) physiological symptom control. When watching the two 'real-life' video segments in section (2b), the performing participant is instructed to apply the strategy of focusing on the positive (e.g., using a small facility for group work in order to foster social skills). In section (2c), the performing participant is instructed to take two deep breaths in the case of feeling stressed while watching the two 'real-life' video segments. After each video segment, the group reflects on the applied symptom control strategy and discusses further strategies.

(3) Interpretation phase. In order to reflect on potential stressful situations (preparation section) and to know how to deal with challenging situations (symptom recognition, psychological and physiological symptom control), all groups collectively reflect on the video segments' content and the exhibited behaviour, experiences and thoughts, as well as changes in heart rate.

Transfer and feedback

After the group discussion, the lecturer moderates a discussion focusing on the transfer of the newly gained experiences and strategies, introduced by the stress lab, into the 'real-life' teaching setting and everyday life. For example, the lecturer may ask participants about the relevance of these situations for their mandatory placement at schools and what competences they learned in the stress lab before instructing them to write an individual take-home-message.

3 Future implications

The aim of the stress lab is to support prospective PE teachers by addressing stressful teaching situations and help prospective PE teachers how to manage these and similar situations. The unique theory-based and practice-oriented approach of the stress lab is characterized by the inclusion of 'real-life' video material and immediate reflection on this material.

First evaluations of the stress lab showed great result. The first step in testing the stress lab was to test its feasibility and acceptance with one small group of voluntary PE students. Both the lecturer and prospective PE teachers perceived the seminar unit as feasible and rich in content. The evaluation of the use of interactive videos and the technical realization was very well perceived. A revised concept with minor adjustments, such as shorter 'real-life' video segments to allow more time for reflections, will be implemented prior to further evaluations: (1) the evaluation in a laboratory setting and (2) the evaluation in a regular university seminar with 30 participants. (1) The stress lab will be evaluated in the laboratory under consistent conditions via cortisol levels, heart rate variability and perceived stress in participants. Information on the subjective perception of and objective stress levels during the challenging situations will be obtained. This information will be implemented in the stress lab before it will be tested with 30 participants of a regular university seminar. (2)

There, the lecturer and the prospective teachers fill out a feedback questionnaire after the 90 minutes session in order to evaluate the entirety of the concept. In the long run, the stress lab is intended to be implemented in the curriculum of the study program of prospective PE teachers at university. It is planned to be part of a seminar that directly prepares participants for their mandatory placement at schools.

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