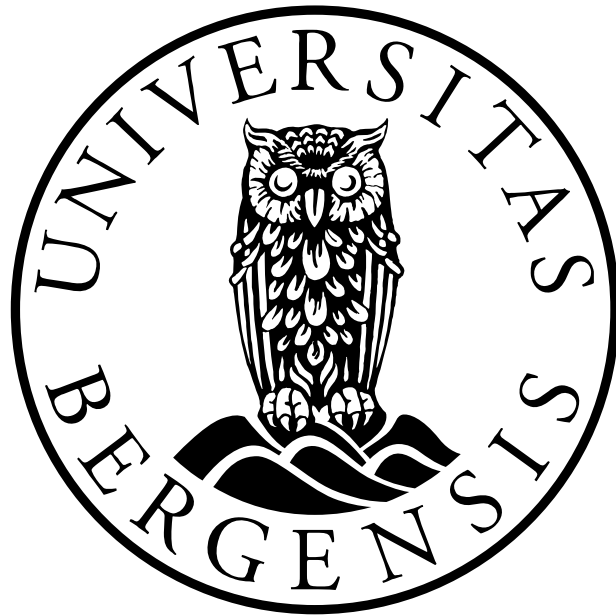


High School Physical Education: Satisfaction of the Basic Psychological Needs and the Experience of Flow.

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Abstract

Introduction The present study aimed at identifying factors promoting enjoyable and positive experiences in PE. The study explored associations between elements of Self-Determination Theory (SDT) and the experience of flow. Special attention was given to sex differences.

Methods The sample comprised 167 senior high school students (78 females and 89 males) who completed a questionnaire after having participated in a PE class.

Results The majority of students experienced levels of flow that can be characterised as high. More boys than girls reported high levels of flow. The basic psychological needs and autonomous motivation were positively and statistically significantly correlated with total flow for the entire sample. For the sample split by sex autonomy no longer correlated with total flow. The independent variables explained 25% and 15% of the variance in total flow for girls and boys respectively. Autonomous motivation had the largest contribution in the explained variance for girls, and self-perceived competence had the largest contribution for boys. Further analyses explored the sex differences through interaction effects, but no such effects were found.

Discussion PE is regarded as a popular subject, which can explain the high prevalence of flow reported in the present study. However, a smaller proportion of the student body did not report to experience flow, and more girls than boys belonged to this group of students. Much indicates that PE is more adjusted to boys, an example from this study being that also self-perceived competence varied between the sexes with more boys than girls reporting to feel competent.

Conclusion If PE was more individually tailored with more differentiated activities it would probably increase the likelihood that each student felt more competent at their own level. As a result, the experience of flow might happen more readily resulting in positive experiences in PE.

Keywords physical education, flow, basic psychological needs, autonomous motivation, high school

1.0 Introduction

1.1 Study Aims

This study examined senior high school students' experience of *flow* in physical education (PE). It utilised flow theory and self-determination theory (SDT) to investigate the association between satisfaction of the three basic psychological needs of competence, autonomy, and relatedness, autonomous motivation, and the experience of flow. Particular attention was given to the aforementioned variables relation to sex differences. The study had an explorative approach aiming at identifying the factors promoting enjoyable and positive experiences in PE. Knowledge regarding factors promoting enjoyable and positive experiences in PE is important in order to prevent students from dropping out of high school PE and to promote physical activity (PA) among youth.

1.2 Background

A physically active lifestyle has significant benefits for health and wellbeing. Although the mechanisms are not entirely understood, research shows that certain levels of PA can reduce the risk of cardiovascular diseases (Archera & Blair, 2011), diabetes (Lindström et al., 2013), and cancer (Kushi et al., 2011). Also, PA has a positive effect on mental health (Ahn & Fedewa, 2011), and life satisfaction (Valois, Zullig, Huebner, & Drane, 2004).

Despite the knowledge regarding the importance of living a physically active life, research shows that young people's PA levels decrease the older they get (Kjønniksen, Torsheim, & Wold, 2008; Kolle, Stokke, Hansen, & Anderssen, 2012; Samdal et al., 2009). WHO's global

recommendations on PA for health for 5 to 17-year-olds is at least 60 minutes of moderate to vigorous PA daily (WHO, 2010). A large national survey conducted in Norway in 2011 showed that among the 9-year olds 69.8% of the girls and 86.2% of the boys met the recommendations of 60 minutes of PA daily. The corresponding figure for 15-year old girls was 43.2% and 58.1% for the boys. For all age groups the boys were significantly more physically active than the girls (Kolle, et al., 2012). A similar study from 2009 including first-year high school students (16-year olds) showed the same tendencies. 29% of the high school boys and 20% of the high school girls reported doing sport or exercise 4-6 times per week. The figures for the 13-year-olds were 34% of the boys and 25% of the girls (Samdal, et al., 2009).

PE constitutes an important arena for PA among young people since PE in most countries is a compulsory subject (Green, 2012). The purpose of PE in the Norwegian school system is “to inspire the students to a physically active lifestyle and lifelong enjoyment for physical activity” (Utdanningsdirektoratet, 2012, p. 2, own translation).

Research from elementary school and junior high school indicates that the majority of students enjoy PE (Koch, 2004; Moser & Jacobsen, 2005; Öquist, 2004). However, the older the students get the more negative they become towards the subject (Kjønniksen, Fjørtoft, & Wold, 2009; Säfvenbom, Haugen, & Bulie, 2014). Lack of challenge and variety in the activities offered seem to cause negative attitudes to PE (Kjønniksen, et al., 2009; Rikard & Banville, 2006). A qualitative study from Norway suggests that for some the negative attitudes continue into and through high school (Andrews & Johansen, 2005).

Further, statistics from the Hordaland county administration in Norway reveal that almost 4% of seniors in high school do not graduate and receive a high school diploma within the standard time limit because they do not complete the PE requirements (Hordaland County, 2013). Hence,

there is a need for knowledge about what factors contribute to failing, and what factors promote positive experiences in PE. Knowledge regarding what factors constitute positive experiences in PE is important because it may help PE teachers choose activities that heighten students' motivation for PE and participation in class. The present study aims at contributing with knowledge of what factors promote enjoyable and positive experiences in high school PE.

1.3 Definitions

Flow. In the positive psychology literature, the concept of flow is described as “a psychological state in which the person feels simultaneously cognitively efficient, motivated, and happy” (Moneta & Csikszentmihalyi, 1996, p. 277). A state of flow can be reached through any task that a person is engaged in, from solving a math problem to engaging in a physically demanding task (M. Csikszentmihalyi & Csikszentmihalyi, 1992). The flow experience is seen to be so rewarding that people want to experience it again (M. Csikszentmihalyi, 1990). In this respect, experiencing flow in PE can be viewed as one dimension of students' positive experiences in PE.

Motivation. Motivation is what “gives behavior its energy and its direction” (Reeve, 2009, p. 8). The processes that energize and direct behaviour come from forces inside the individual and from the environment; therefore, different *types* of motivation exist (Reeve, 2009). A main distinction is between intrinsic and extrinsic motivation, with intrinsic motivation being when behaviour is driven by the joy of an activity itself, whereas extrinsic behaviour is driven by an external reward (Deci & Ryan, 2000a).

Autonomous motivation. According to Self-Determination Theory (SDT) autonomous motivation can be viewed as synonymous to self-determined motivation (Fortier & Kowal, 2007), and is when a behaviour is driven by choice and volition (Deci & Ryan, 2000).

Autonomous motivation comprises intrinsic motivation, integrated regulation and identified regulation (Deci & Ryan, 2008). Integrated regulation and identified regulation are extrinsically types of motivation both being relatively self-determined (Deci & Ryan, 2000). Identified regulation is when a behaviour is valued and identified as personally important, and integrated regulation is when a behaviour is fully integrated to the self and are in accordance with ones values and needs (Deci & Ryan, 2000).

Basic psychological needs. According to SDT the basis for human motivation is three innate psychological needs (Deci & Ryan, 2002b). These needs – the needs for *competence*, *autonomy*, and *relatedness* – are referred to within SDT as *basic psychological needs* (Deci & Ryan, 2002b). SDT suggests that contexts where the basic psychological needs are being supported are most likely to facilitate intrinsic motivation, whereas factors that diminish feelings of autonomy, competence and relatedness are theorised to undermine intrinsic motivation (Deci & Ryan, 2007).

High school physical education. High school is part of the basic education in Norway. All young people between 16 and 24 have a right to attend this school level. High school is divided into different tracks with a main distinction between vocational¹ studies and theoretical studies. In both tracks PE is a compulsory two hours weekly subject. PE is divided into four main areas; sport, outdoor activities, dance, and lifestyle activities (Utdanningsdirektoratet, 2012).

¹ Vocational studies are more practically oriented and include work experience.

1.4 Contributions and relevance to health promotion

Health promotion is the process of enabling people to increase control over, and to improve, their health (WHO, 1986). The values of health promotion are in many ways consistent with the purpose of PE which seeks to enable and inspire a group of individuals to improve their health through PA. Research on PA shows that positive experiences in PA during childhood and adolescence can be a significant contributor to lifelong participation in PA (Kjønniksen, et al., 2009; Kjønniksen, et al., 2008; Telama et al., 2005).

Given that positive experiences in PA during childhood and adolescence can increase the probability that young people will adopt an active lifestyle which they will continue into and through adulthood (Kjønniksen, et al., 2009), it is important to facilitate for positive PE experiences. Hence, from a health promoting perspective, facilitating for positive PE experiences for all children and adolescents can have significant health benefits for individuals and society.

2.0 Theoretical framework

2.1 Flow Theory

The concept of *flow* was developed from interviews with people investing a lot of time and energy on activities having no obvious external rewards (M. Csikszentmihalyi, 1975). Determining what makes an activity valuable and satisfying became the focus of Mihaly Csikszentmihalyi's work (Engeser & Schiepe-Tiska, 2012).

Flow denotes the wholistic sensation present when we act in total involvement. It is the kind of feeling after which one nostalgically says: "that was fun," or "that was enjoyable." It is the state in which action follows upon action according to an internal logic which seems to need no conscious intervention on our part. We experience it as a unified flowing from one moment to the next, in which we feel in control of our actions, and in which there is little distinction between self and environment; between stimulus and response; or between past, present, and future (M. Csikszentmihalyi, 1975, p. 43).

This is what Csikszentmihalyi means by *optimal experience*, which takes place when a person directs concentration towards a specific goal. As it appears from the quotation above, the flow state is characterised by the following components; an optimal balance between one's skills and the difficulty of the activity, the presence of clear goals, the presence of clear, unambiguous feedback, intense and focused concentration on what one is doing, loss of reflective self-consciousness, a sense that one can control one's actions, the time is transformed, and an experience of the activity being rewarding in and of itself (M. Csikszentmihalyi, 1975, 1990).

The balance between one's skills and the challenge level of the task is essential in experiencing flow (Figure 1) (Moneta & Csikszentmihalyi, 1996). Hence, if the challenge of the task exceeds the level of skills, the person experiences anxiety. If skills are perceived to be greater than the challenge of the task, the person experiences boredom. In situations where both skills and

challenge are perceived as high the flow experience will occur and the quality of the experience will be at the highest. However, if the perception of both skills and challenge is low, apathy tends to emerge (Moneta & Csikszentmihalyi, 1996).

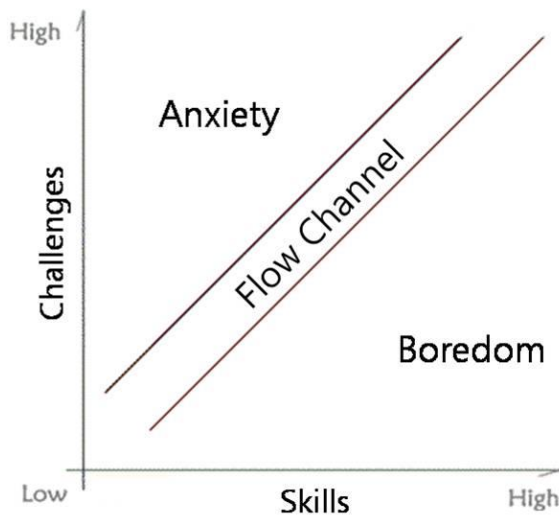


Figure 1. Model of the flow state. Adapted from Csikszentmihalyi (1990).

Another essential part of experiencing flow is that the experience only seems to happen when a person is actively involved in a physical, emotional, or intellectual interaction with the environment (M. Csikszentmihalyi, 1975). Therefore, Csikszentmihalyi talks of *flow activities*, which are activities designed so as to make flow experiences easier to achieve: “They have rules that require the learning of skills, they set up goals, they provide feedback, and they make control possible” (M. Csikszentmihalyi, 1990, p. 72). Sports, games, and dance are excellent examples of such activities. Further, Csikszentmihalyi (1990) states that even the simplest physical act can become enjoyable by transforming it so as to produce flow. This information could be critical in analysing activities undertaken in PE.

According to Csikszentmihalyi the experience of flow, and the psychological conditions that make it possible, seem to be the same worldwide (M. Csikszentmihalyi, 1990). Interviews and questionnaires from thousands of respondents with different age, sex, culture and social class showed that their descriptions of enjoyment were almost identical (M. Csikszentmihalyi, 1990).

As flow is an enjoyable psychological state seen to be so rewarding that people want to experience it again, the achievement of students' flow experiences in PE seems desirable in order to motivate students for future participation in PE.

2.2 Self-Determination Theory

SDT is a theory about human motivation, development, and wellbeing (Deci & Ryan, 2008). It is a social cognitive theory and a dialectical model, thus it is concerned with both the inner resources of the individual and the social context an individual unfolds in (Deci & Ryan, 2002b).

SDT evolved from studies comparing the intrinsic and extrinsic motives for human behaviour. Edward L. Deci and Richard M. Ryan expanded this work and intrinsic and extrinsic motivations are some of the key concepts of SDT, together with the basic psychological needs. The needs for competence, autonomy, and relatedness, which are said to be universal, appear to be essential for facilitating optimal functioning for growth, social development and personal wellbeing (Deci & Ryan, 2000). Social-contextual conditions will influence these needs and thereby facilitate or undermine the natural processes of intrinsic motivation, self-regulation, and wellbeing (Deci & Ryan, 2000).

Competence is the need to succeed in optimally challenging tasks, achieve a desired outcome, and achieve a feeling of success. The need for competence leads people to seek challenges that are optimal for their capacities (Deci & Ryan, 2002b).

Autonomy is the need to make own choices and to initiate own actions. Autonomy is about acting from interest and integrated values (Deci & Ryan, 2002b).

Relatedness is the need to establish mutual respect and trust with other people and to feel connected to others (Deci & Ryan, 2002b). Yet, many intrinsically motivated behaviours are happily being performed in solitude indicating that relatedness is not necessary for intrinsic motivation (Deci & Ryan, 2000).

Deci and Ryan (1985) reason that the relative impact of each need can vary depending on the situation. Further, they say, the needs are related and overlap, hence it is difficult to isolate one need. Also, past work has shown the three needs to predict self-determined motivation, both independently and combined (Edmunds, Ntoumanis, & Duda, 2007).

Hence, it can be theorised that PE, which for some is extrinsically motivating, can be made more intrinsically motivating by making the fulfilment of the basic psychological needs possible. “For example people can be given choices about when and how they engage in the activity; exercise goals can be made optimally challenging; an atmosphere of relatedness can be created; and so on” (Deci & Ryan, 2007, p. 5).

Many contemporary theories of motivation treat motivation as a unitary concept, where the focus is on the overall amount of motivation a person has for a certain activity. SDT, on the other hand, divides motivation into different types of motivation, as shown in Figure 2 (Deci & Ryan, 2002b).

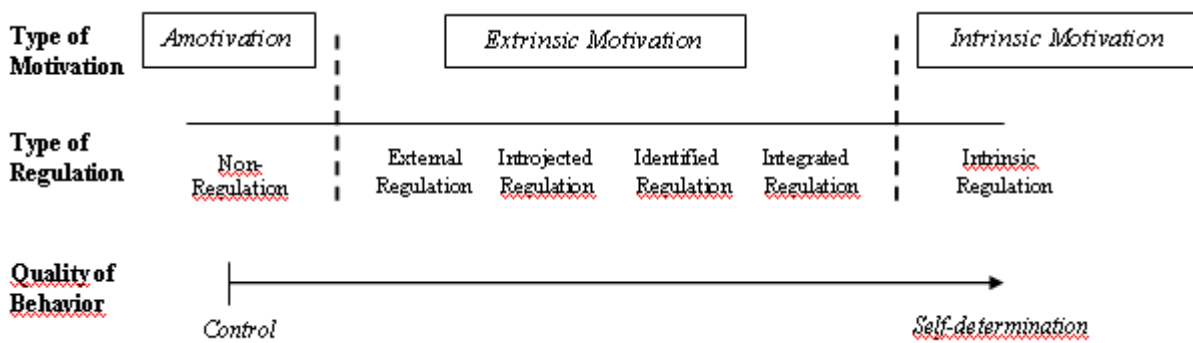


Figure 2. *The self-determination continuum, showing the motivational, and self-regulatory types of behaviours that vary in the degree to which they are self-determined (Deci & Ryan, 2002b).*

A lot of research confirms that the type of motivation is more important than the amount of motivation in predicting outcomes such as psychological health and wellbeing (Deci & Ryan, 2008). Deci and Ryan order the different types of motivated behaviour along a self-determination continuum (Figure 2), with amotivation or unwillingness in the one end and intrinsic motivation in the other end. In between is extrinsic motivation, which according to SDT, can vary greatly in its relative autonomy (Ntoumanis, 2001). Relative autonomy means how much the extrinsic motives emanate from or reflect one's self and range from those motives that are externally controlled to those that are personally valued and therefore are autonomous (Edmunds, et al., 2007).

The types of extrinsic motivation are external regulation (e.g. I participate in PE because I'll get into trouble if I don't), introjected regulation (e.g. I participate in PE because I want the teacher to think I am a good student), identified regulation (e.g. I participate in PE because I want to learn and understand the subject), and integrated regulation (e.g. I participate in PE because it is important for me to have a healthy lifestyle), in order from the controlled motives to the autonomous motives (Edmunds, et al., 2007). The most autonomous types of extrinsic motivation are said to be barely distinguishable from intrinsic motivation (Deci & Ryan, 2000), and will also lead to positive functioning, and enhanced psychological health and wellbeing (Deci & Ryan,

2007). However, these are still extrinsically motivated behaviours because they are performed to achieve personal goals (Ntoumanis, 2001).

SDT has a high applicability to domains such as sport and education, and it is one of the most used theoretical frameworks for the study of PE (Ntoumanis & Standage, 2009; Standage, Gillison, & Treasure, 2007).

2.3 Self-Determination Theory and Flow Theory

SDT and flow theory share many similarities. The theory of flow is partially developed on the basis of work on intrinsic motivation, and conceptually the flow experience is seen to be similar to intrinsic motivation (M. Csikszentmihalyi, 1975, 2002; Fortier & Kowal, 2007). Within SDT experiencing flow is understood as “representing the heightened awareness and feelings of well-being associated with intrinsic motivation” (Frederick-Recascino, 2002, p. 279). Therefore, as Seifert and Hedderson (2010) highlight, there is an intuitive relationship between intrinsic motivation and flow.

Deci and Ryan (1985) state that theoretically an individual who is intrinsically motivated is more likely to experience flow because he or she is more interested in the activity. Further, Fortier and Kowal (2007) conceptualize flow as a motivational outcome, a conceptualization that Seifert and Hedderson (2010) support. They argue that flow should be considered a direct consequence of intrinsic motivation, and not equivalent to intrinsic motivation. The theories share closely-related characteristics, and previous research has found positive relationships between the basic psychological needs and the experience of flow (Kowal & Fortier, 1999).

As flow is seen to be so rewarding that people wants to experience it again, experiencing flow in PE can be significant for future participation in PE. SDT has high applicability to PE, and numerous studies have tested SDT in PE. By including SDT in the present study a greater understanding of the experience of flow can be gained.

3.0 Empirical literature review

3.1 Flow in PE

Within the framework of flow theory, Shernoff and colleagues (2003) studied high school students' engagement in classes in general. For the most part the students reported higher engagement in non-academic subjects such as computer science, art, and vocational education, compared to in academic subjects such as Maths, English, and Science. Although, Shernoff did not analyse PE, González-Cutre and colleagues (2009) argued that, given the similar characteristics of PE to those of “non-academic” subjects, students may also achieve flow quite readily in PE.

Regarding the experience of flow in a PE setting little research has been published. Most of the published work has focused on how the motivational climate affects the experience of flow (Bakirtzoglou & Ioannou, 2011; Cervelló, Moreno, Villodre, & Iglesias, 2006; González-Cutre, et al., 2009). A growing body of PE research makes a distinction between task-oriented and ego-oriented motivational climates. A task-oriented motivational climate is associated with the equivalent of ability and effort, while an ego-oriented motivational climate is associated with a focus on superiority and competition (Bakirtzoglou & Ioannou, 2011). González-Cutre and colleagues (2009) studied 779 students (12-16 years old), and found that a task-involving climate positively predicted social goals in terms of relationship and responsibility, and perceived competence; which in turn positively predicted the experience of flow in PE.

Although little research exists on the experience of flow in PE, one of the major areas of research on flow is from sports (Engeser & Schiepe-Tiska, 2012). This body of research has focused both on competitive and non-competitive sport climates showing that the flow experience is possible in both climates (Elbe, Strahler, Krstrup, Wikman, & Stelter, 2010; Jackson, Thomas,

Marsh, & Smethurst, 2001; Kowal & Fortier, 1999; Stein, Kimiecik, Daniels, & Jackson, 1995). Most of the flow research has focused on individual sports. Nevertheless, Elbe and colleagues (2010) found in their exercise intervention study that participants in four different exercise groups (continuous running, soccer, interval running and strength training) experienced flow regardless of whether the intervention was a team or individual sport. These findings suggest that it may be possible to experience flow in a PE setting, since this supposedly is a non-competitive setting involving both individual sports and team sports.

3.2 Satisfaction of the basic psychological needs in PE

Research shows that teachers' behaviours perceived as autonomy-supportive are positively associated with students' self-determined motivation in PE (Bagøien, Halvari, & Nesheim, 2010; Hastie, Rudisill, & Wadsworth, 2012; Ntoumanis & Standage, 2009; Standage, Duda, & Ntoumanis, 2005; R. Vallerand & Losier, 1999). Koka and Hagger's study (2010) of democratic versus autocratic teaching behaviours in PE, and verbal versus nonverbal feedback from PE teachers, support this finding. The results of this study indicated that satisfying the psychological needs for competence and relatedness, but not autonomy, were related to students' self-determined motivation. The more students perceived that their teacher provided positive feedback the more they felt their needs to be competent, autonomous, and related to their classmates were satisfied; in turn, their reasons to participate in PE were more self-determined (Koka & Hagger, 2010).

Further, Ntoumanis (2001) found in his study of 424 British students aged 14-16 years that perceived competence had the largest effect on the different motivational types, indicating that in PE the role of competence is central. Therefore, Ntoumanis (2001) concluded that students with

prior PA experience who feel physically competent are more likely to find PE interesting and fun, and are more self-determined motivated, whereas the students with low self-perceived competence will find PE boring and meaningless.

3.3 Autonomous motivation in PE

Research shows that students who are intrinsically motivated are more curious, show more initiative, are more desired for challenges, and learn more effectively compared to extrinsically motivated students (Deci & Ryan, 2000; Reeve, 2002).

A large body of research has tested SDT in PE (Hastie, et al., 2012; Liukkonen, Barkoukis, Watt, & Jaakkola, 2010; Lonsdale, Sabiston, Raedeke, Ha, & Sum, 2009; Ntoumanis, 2001; Ntoumanis & Standage, 2009). Ntoumanis and Standage (2009) presented a brief overview of studies employing SDT in school PE. Together, the results suggested that satisfaction of the basic psychological needs in PE had direct, positive relations to autonomous motivation and well-internalized extrinsic motivation (Ntoumanis & Standage, 2009).

In addition, Standage and colleagues (2005) found in their study of 950 junior high school students, that intrinsic motivation positively predicted concentration, preference to attempt challenging tasks, and positive affect. Moreover, intrinsic motivation negatively predicted feelings of unhappiness.

3.4 Flow and SDT

A consistent finding in the leisure time research is the positive association between intrinsic motivation and flow (Fortier & Kowal, 2007). Kowal and Fortier (1999) examined flow in 203 master's-level swimmers. They found that swimmers who were autonomously motivated reported the highest instances of flow, while swimmers who were motivated in a non-self-determined way reported the lowest levels of flow. Also, they found that perceptions of autonomy, competence, and relatedness were positively related to the experience of flow (Kowal & Fortier, 1999).

In addition, Mills and Fullagar (2008) aimed to understand student flow experiences in a sample of 327 architecture students. More specifically they examined the relation between flow and the different types of motivation in academic activities. They found a significant positive relation between intrinsic motivation and the experience of flow. Whereas, Kowal and Fortier (1999) only did correlational analyses, Mills and Fullagar adopted a hierarchical approach and found that the correlations between each form of extrinsic motivation and flow became non-significant when controlling for intrinsic motivation (Mills & Fullagar, 2008). The overall findings of Mills and Fullagar's research support Csikszentmihalyi's contention that flow is an intrinsically motivating experience (Mills & Fullagar, 2008). Kowal and Fortier, on the other hand, conceptualize flow as a motivational outcome.

Further, Seifert and Hedderson (2010) studied intrinsic motivation and flow in skateboarding trying to make a clear delineation of the psychological mechanisms linking intrinsic motivation to flow. They wanted to study whether central constructs of SDT (specifically autonomy and competence) played a role in understanding flow. They found that autonomy allowed the skateboarders to set challenges. By overcoming the challenges through effort and concentration, the

skateboarders experienced pleasure, satisfaction, and flow. This led to new challenges, new efforts and more flow experiences (Seifert & Hedderson, 2010).

When it comes to PE, it has not been possible to find published research combining SDT and flow theory. This underlines the need for research on these specific mechanisms in the PE context, and the relevance of the present study.

3.5 Sex differences

The role of sex differences in athletes experiencing flow has not been widely researched (Elbe, et al., 2010). Studies that did investigate sex differences in the experience of flow in PA or sports found no significant differences between males and females (Bakirtzoglou & Ioannou, 2011; González-Cutre, et al., 2009). However, Elbe and colleagues (2010) found sex differences in their intervention study with female runners experiencing the highest levels of flow and male football players experiencing the lowest levels of flow. A significant difference was found between the female intervention groups, with female runners experiencing more flow than female football players (Elbe, et al., 2010). However, given the small sample size in the aforementioned study (N = 77, divided into six intervention groups), statistical analysis needs to be interpreted with caution. Moreover, the intervention groups were segregated by sex. As flow happens in an interaction between the environment and the individual, it is difficult to determine whether the sex differences between the groups occurred because of differences between the sexes or because of environmental differences. From a sex difference perspective, it would have been more informative to study mixed sex intervention groups and to look at the differences inwardly in the groups.

The psychological constructs of SDT are said to be universal: “SDT asserts (...) that all humans, regardless of culture or gender, need to feel both related and autonomous in order to be healthy (...)” (Deci & Ryan, 2002a, p. 435). However, the literatures show inconsistent findings with respect to sex differences. Therefore, Guérin and colleagues did a meta-analysis to examine differences between men and women on SDT’s motivational regulations for exercise (Guérin, Bales, Sweet, & Fortier, 2012). They looked into a total of 27 studies and found that scores for men and women were not significantly different for any of the motivational regulations (Guérin, et al., 2012).

Moreover, Ntoumanis (2001) tested a pattern of motivational sequences, where he looked into sex differences in PE. The results indicated the motivational processes to be largely invariant across male and female students. Standage and colleagues (2005) tested a similar model, which also was largely invariant across the sexes. Nevertheless, some of the paths in the model were found to differ between the male and female students. The path between need satisfaction and introjected regulation (e.g. I participate in PE because I want the teacher to think I am a good student) was significant for the female students, but non-significant for the male students.

However, many of the studies employing SDT in PE did not take sex differences into account (Hastie, et al., 2012; Liukkonen, et al., 2010; Lonsdale, et al., 2009; Ntoumanis & Standage, 2009). This signifies a major gap in the existing literature as the PE setting might be different from other sports or activity settings in terms of producing differences in the experiences depending on sex.

4.0 Research questions

Based on the theoretical framework and the literature reviewed above, this study seeks to contribute to the scarce, but increasing knowledge of what factors promote enjoyable and positive experiences in PE among students. The research questions are presented below:

1. To what extent do high school students experience flow in PE?

Is there a difference between the sexes?

2. What are the associations between satisfaction of the basic psychological needs, autonomous motivation, and the experience of flow in PE?

Is there a difference between the sexes?

3. To what extent does satisfaction of the basic psychological needs and autonomous motivation predict the experience of flow in PE?

Is there a difference between the sexes?

4. Does sex moderate the relationships between the satisfaction of the basic psychological needs, autonomous motivation and the experience of flow in PE?

5.0 Methods

For the present study, survey was the preferred type of data collection procedure due to its broad reach of participants. A survey makes it possible to look at different variables and the relationships among these. It can yield descriptive data on the variables, which is useful if the intention is to examine people's attitudes, behaviours and experiences in a natural setting (Cozby, 2009; Howitt & Cramer, 2003).

Both within flow theory and SDT standardised scales have been developed and validated. Hence, there exist good instruments for this type of study.

5.1 Preparation of the questionnaire

The questionnaire was developed by researchers at the University of Bergen, and it was based on a combination of Norwegian translations of standardised scales and questions formulated specifically for this study. The design of the questionnaire was influenced by flow theory and SDT.

The first questions in the questionnaire addressed background information such as sex, which high school track the students attend, and which type of activities the students just had participated in. These factual questions can be seen as openers to the rest of the questionnaire, as they are recognizable and refer to something everyone can answer, and this captures the attention of the participants (Cozby, 2009).

The factual questions were followed by a mix of standardised scales, questions about physical activity level in leisure-time, and participation in PE. These questions can be viewed as being more interesting and thereby motivate the participants to complete the questionnaire (Cozby, 2009).

5.2 Participants

The participants were 167 third-year high school students aged 17-19 years all attending theoretical high school tracks. Third-year students were asked to participate because participation in PE is compulsory in order for the students to achieve a high school diploma. Hence, passing in PE is necessary for their admission into college and university.

The participants were recruited from nine classes from four schools in the city of Bergen in Norway. The schools were selected because of their role as collaborating partners with the University of Bergen. The sample comprised 78 girls and 89 boys.

5.3 Procedures

The study was approved by the Norwegian Social Science Data Services. Permission was obtained by the school leaders and the PE teachers to undertake the survey during school hours. Information letters were given to potential participants. The information letter briefly outlined the nature of the study, and informed the participants that the data would be kept confidential. The letter also made clear that the students could refuse participation at any point, refuse to answer any questions, or withdraw from the study with no penalty or potential effect on their future

participation in PE or their assessment in PE. The students participated in the study voluntarily, once they had completed an informed written consent.

The questionnaires and instructions were sent to the schools during the spring 2013 where the teachers administered them. The questionnaires were completed after a PE class to ensure high participation rate. The students were instructed to think about their experiences in PE in general when answering the survey, the exception being the questions measuring flow where they were explicitly asked to think about the recent PE class they just participated in. All the students agreed to participate, but due to some incomplete questionnaires the response rate was 92.8%.

5.4 Measures

5.4.1 Dependent variable

Total Flow. A Norwegian version of the 10-items Flow Short Scale (FKS) originally developed by Rheinberg and colleagues (2003) was applied. The scale was originally derived from the Experience Sampling Method (ESM), which is a more comprehensive method to measure flow, with the goal of capturing the different aspects of flow in daily life. The FKS captures all the components of the flow experience and is applicable for various activities (Rheinberg, et al., 2003). The FKS has been validated and successfully used in several studies (Elbe, et al., 2010; Engeser & Rheinberg, 2008; Rheinberg, et al., 2003). According to Rheinberg (2004) the total flow score has good internal consistency, with a Cronbach's alpha coefficient reported of .90. In the current study the Cronbach's alpha coefficient was .76 (See Table 1).

The scale assesses the total flow score (10 items) on a seven-point Likert scale from *not true* to *true*. It includes questions like: “I feel just the right amount of challenge”, “I don’t notice time passing” and “I have no difficulty concentrating” (For full version of the questionnaire, see Appendix). Values closer to 6 indicate very high flow rates; whereas values closer to 0 indicate low flow rates. For convenience of interpretation all scales originally coded 1-7 were recoded to 0-6. High flow values are described as being higher than 4 (Elbe, et al., 2010).

5.4.2 Independent variables

Self-rated autonomous motivation. The Norwegian version of the Self-Regulation Questionnaire (SRQ) developed by Ryan and Connell (1989) was applied. The participants were asked why they *participate* and why they *make an effort* in PE. To these questions the participants were provided with various statements, to which they rated their answer on a 4-point Likert scale from *agree a lot* to *disagree a lot*.

The various statements identified the different motivational types with four statements making up a scale for each motivational type. Intrinsic motivation was identified with statements like: “I participate in PE because it is fun”. Identified motivation was identified with statements like: “I participate because I want to learn and understand PE“. For the present study the sum of intrinsic and identified motivation was comprised to one score; autonomous motivation.

The reliability and validity of SRQ among Norwegian students have been shown to be satisfactory (Cock & Halvari, 1999). The Cronbach’s alpha for intrinsic and identified motivation was .90 (See Table 1). The scale was negatively skewed (-1,18), and therefore, turned into a

dichotomous categorical variable; low versus high autonomous motivation, with the cases evenly distributed in the two categories.

Basic psychological need satisfaction. The Norwegian version of the Basic Psychological Need Satisfaction in Exercise Scale was applied (BPNES; Vlachopoulos & Michailidou, 2006). The BPNES was developed for Greek-speaking exercise participants, and has been translated to English (Vlachopoulos, Ntoumanis, & Smith, 2010). For this study the scale was adapted to a PE context.

Four items measured the degree to which the participants' need for autonomy was satisfied in PE with questions like: "I feel PE is in agreement with my choices and interests". To which the participants could answer on a 7-point Likert scale from *agree a lot* to *disagree a lot*. The Cronbach's alpha for autonomy for the present study was .83 (See Table 1).

Four items measured the degree to which the participants' need for competence was satisfied in PE with questions like: "I feel PE is something I manage well". To which the participants could answer on a 7-point Likert scale from *agree a lot* to *disagree a lot*. The Cronbach's alpha for competence was .82 (See Table 1).

Four items measured the degree to which the participants' need for relatedness was satisfied in PE with questions like: "I feel well together with the other students". To which the participants could answer on a 7-point Likert scale from *agree a lot* to *disagree a lot*. The Cronbach's alpha for relatedness was .88 (See Table 1).

The Cronbach's alpha for the three subscales were above the suggested limit of .70 (Cronbach, 1951), and are consistent with other studies (Vlachopoulos & Michailidou, 2006).

Relatedness was negatively skewed (-1,47), and therefore turned into a dichotomous categorical variable; low and high self-perceived relatedness. For analysis and comparison purposes, self-perceived autonomy and self-perceived competence were also turned into dichotomous categorical variables.

5.5 Data analysis

For the data analysis the Statistical Package for the Social Sciences (SPSS version 19.0) was used. Cases were excluded pairwise, and the analyses were performed in the following steps:

1. All variables were checked for errors and missing values.
2. All variables were recoded to increasing values with minimum value 0. This was done for further analyses.
3. Descriptive statistics were obtained for all the variables to check for outliers, normal distribution, means, and standard deviation.
4. The reliability of the scales was tested using Cronbach's alpha coefficient.
5. Skewed variables were turned into categorical variables.
6. Frequency analyses were obtained for all the categorical variables.
7. Sex differences were assessed by Chi-square test for independence and independent-samples t-test.
8. Statistical significance was determined at $p \leq 0.05$.
9. Correlation analyses were performed to identify any significant associations between the independent variables and the outcome variable.

10. Preliminary analysis of regression analyses were conducted, including the inter-correlation between the independent variables to check for multicollinearity.
11. Hierarchical multiple regression analysis was performed to assess the impact of the basic psychological needs and autonomous motivation on total flow.
12. Hierarchical multiple regression analysis was done split by sex.
13. Two-way between-groups analyses of variance (ANOVA) were used to explore the possibility of an interaction effect between the psychological needs and sex, and autonomous motivation and sex on flow.

5.6 Ethical considerations

In research, individuals have the rights to privacy, confidentiality and self-determination (APA, 2010). The informed written consent contained all the information the participants needed to get a reasonable understanding of the research in question, of the consequences of participating in the research, and of the purpose of the research (NESH, 2006). The anonymity of the identity of the source of the data has been ensured with no personally identifiable data.

The study does not involve any intervention besides answering the questionnaire. The study instruments used in the questionnaire have been extensively tested in previous studies, and therefore, it is assumed that this work does not burden the participants in any way.

5.7 Weaknesses of the study design

The reliability, validity and generalizability of the results are influenced by the study design. In the following the weaknesses of the study design will be deliberated.

The questions asked in the present study were closed-ended, which is a more structured approach than open-ended questions. They are easier to code and the response alternatives are the same for everyone (Cozby, 2009). However, the closed-ended questions gave the participants limited alternatives and no room to express them freely (Cozby, 2009). Consequently, qualitative information was left out, which could have contributed with a greater understanding of the flow experience in high school PE. Also, there were some incomplete questionnaires which might be due to the closed-ended questions. If the students felt their response was not represented by the alternatives they might have refused to answer. On the other hand, open-ended questions take more time to answer which some students might have resisted if they had been included in the survey (Mitchell & Jolley, 1992).

The sample of the present study was based on convenience rather than randomness. Therefore, the sample can be regarded as biased because it only included students from the same geographical area that has certain social and economic characteristics. However, the study focused on the relationship between the variables, and therefore the biased sample is not of great concern (Cozby, 2009). Also, even though the data cannot be strictly generalized beyond the study population, the findings provide important information.

Furthermore, one of the weaknesses of the study was the cross-sectional study design, which made it difficult to make inferences about causality (Field, 2009). In addition, it might be that the relationship between the study variables was influenced by confounding variables. Therefore, it

cannot be determined which of the variables were responsible for the experience of flow in PE, and the order in which the variables affected each other. However, it can be argued that the search for causal relationships is irrelevant, since the variables mutually influence each other and the assumption of causality can go both ways. Autonomous motivation might lead to the experience of flow, and simultaneously, the experience of flow might lead to autonomous motivation, which again leads to the experience of flow.

Finally, the independent variables were turned into dichotomous categorical variables because the variables as continuous were too skewed looking at the histogram (Field, 2009). Also, the Kolmogorov-Smirnov statistic suggested violation of the assumption of normality with Sig. values of .000 for both *autonomous motivation* and *relatedness*. Turning the continuous variables into dichotomous categorical variables possibly resulted in a loss of information (Hagle, 2004). However, the more advanced analyses like regression and ANOVA assume that the scores on each of the variables are normally distributed (Field, 2009). If the assumption of normality is violated it will affect the validity of the results. The continuous variables turned into categorical variables have been evenly distributed with approximately the same number of cases in the two categories. Therefore, autonomy and competence are fairly distributed into *low* and *high*. However, because of the skewness in autonomous motivation and relatedness the distribution into low and high categories are somehow misleading. A distribution into *highly* and *less highly* would be more accurate. This must be taken into account when interpreting the results.

6.0 Results

6.1 Descriptive analyses

Preliminary analyses were performed to check for violation of the assumptions of normality, linearity and homoscedasticity. Descriptive statistics showed violation of normality for autonomous motivation and relatedness (Table 1).

Descriptive statistics for the continuous variables are shown in Table 1. Total flow is relatively normally distributed with a mean score of 4.35. A frequency analysis revealed that 65.8% of the students ($N = 155$) had high flow values, that being the values described as greater than 4. More boys (76.8%) than girls (53.4%) reported high flow values. An independent samples t-test showed that mean difference in flow experience between boys and girls was statistically significant ($p \leq .001$) (Table 1) with an eta squared value of 0.073, indicating a moderate effect (Cohen, 1988).

Further, autonomy and competence were also relatively normally distributed with mean scores of 3.48 and 4.23 respectively. A frequency analysis revealed a wide spread in responses for autonomy with some students reporting high autonomy, and others reporting low. For competence the responses were mainly centred in the middle or above indicating that the students felt relatively competent.

An independent samples t-test showed that mean differences in competence between boys and girls was statistically significant ($p \leq .001$) with an eta squared value of 0.067, indicating a moderate effect (Cohen, 1988). A t-test showed no sex differences in autonomous motivation, autonomy, and relatedness.

Table 1. Descriptive statistics for continuous variables. Skewness, kurtosis, Cronbach's alpha coefficients (α) and t-test (sex) for the instruments of the study.

Variable	Range	M	SD	Skewness	Kurtosis	α	t
Total Flow	0-6	4.35	0.82	-.33	-.35	.76	3.48***
Autonomous mot.	0-3	2.26	0.66	-1.18	1.14	.90	1.10
Autonomy	0-6	3.48	1.09	.06	.22	.83	-.53
Competence	0-6	4.23	1.06	-.59	.14	.82	3.39***
Relatedness	0-6	4.92	1.23	-1.47	3.13	.88	1.57

SD = Standard deviation, M = Means

p<.001***

p<.01**

p<.05*

Autonomous motivation and relatedness were negatively skewed, indicating highly autonomously motivated students, who feel related to one another. For further analyses the variables were turned into dichotomous categorical variables. For comparison of the basic psychological needs competence and autonomy were also turned into categorical variables. The continuous variables turned into categorical variables were as far as possible evenly distributed into two categories (See Appendix, Table 1).

Further, the relationships between the categorical variables and sex were tested using a Chi-square test for independence (with Yates Continuity Correction). A significant association between sex and self-perceived competence, $\chi^2(1, N = 161) = 5.98, p = .014, \phi = -.21$, was found (See Appendix, Table 1).

6.2 Correlation analyses

The bivariate relationships between the variables of interest were investigated using Pearson product-moment correlation coefficient (Table 2). This technique is usually used between continuous variables, but it can be used when one of the variables is categorical with only two

categories (Field, 2009). Total flow is a continuous variable and is treated as the outcome variable. The relationships of interest were between the dichotomous categorical variables and the outcome variable.

The size of the value of the correlation coefficient can range from -1.00 to 1.00. The value indicates the strength of the relationship. According to Cohen (1988) values of $\pm .1$ indicate a small effect, values of $\pm .3$ a moderate effect, and $\pm .5$ indicate a large effect.

The relationship between total flow and the independent variables were all positively and statistically significantly correlated, with autonomous motivation ($r = .38, n = 144, p \leq .001$), and competence ($r = .40, n = 150, p \leq .001$) being the strongest predictors, followed by relatedness ($r = .24, n = 151, p \leq .01$) and autonomy ($r = .17, n = 154, p \leq .05$). (Table 2).

Table 2. Pearson Product-moment Correlations among study variables.

Variable	1	2	3	4	5
1. Total Flow	-				
2. Autonomous mot.	.38***	-			
3. Competence	.40***	.45***	-		
4. Autonomy	.17*	.37***	.32***	-	
5. Relatedness	.24**	.19*	.23**	.16*	-

Two-tailed
 $p < .001$ ***
 $p < .01$ **
 $p < .05$ *

Based on the sex differences observed in t-test and chi-square the correlation analysis was also done split by sex (Table 3). For the sample split by sex the results showed that total flow and autonomous motivation were statistically significantly correlated for girls ($r = .48, n = 67, p \leq .001$) but not for boys. Self-perceived competence was statistically significantly correlated with total flow for both girls ($r = .32, n = 70, p \leq .01$.) and boys ($r = .43, n = 80, p \leq .001$). Relatedness was statistically significantly correlated with total flow for girls ($r = .31, n = 71, p \leq .01$), but not for boys. Autonomy was not statistically significantly correlated with total flow for either boys or girls.

Table 3. Pearson Product-moment Correlations among study variables. Girls below and boys above the main diagonal.

Variable	1	2	3	4	5
1. Total Flow	-	.23*	.43***	.21	.08
2. Autonomous mot.	.48***	-	.37**	.30**	.17
3. Competence	.32**	.51***	-	.29**	.26*
4. Autonomy	.19	.47***	.39***	-	.19
5. Relatedness	.31**	.19	.15	.21	-

Two-tailed
 p<.001***
 p<.01**
 p<.05*

6.3 Hierarchical multiple regression analysis

Hierarchical multiple regression was used to assess the ability of the basic psychological needs and autonomous motivation to predict the experience of flow in PE (Table 4). Sex was entered in Block 1 as control variable. The basic psychological needs were entered together in Block 2 since the needs theoretically are said not to be hierarchically different (Deci & Ryan, 2002b). Autonomous motivation was entered last since theory and previous research have showed strong relationship between autonomous motivation and flow (M. Csikszentmihalyi, 1975; Deci & Ryan, 1985; Fortier & Kowal, 2007).

Sex was entered in Block 1 (Table 4, Block 1) and statistically significantly predicted experiencing flow ($p \leq .001$) with a beta coefficient of $-.27$. In Block 2 total flow was regressed on sex and the basic psychological needs. Sex statistically significantly predicted experiencing flow ($p \leq .05$) with a beta coefficient of $-.17$. Of the basic psychological needs only the need for competence statistically significantly predicted experiencing flow ($p \leq .001$) with a beta coefficient of $.31$.

In the last block autonomous motivation was entered. When controlling for all the other variables autonomous motivation statistically significantly predicted experiencing flow ($p \leq .01$) with a beta coefficient of .23. Sex ($p \leq .05$) and competence ($p \leq .01$) remained statistically significant predictors with beta coefficients of -.17 and .24 respectively.

The basic psychological needs entered in Block 2 explained 20% of the variance in total flow measured by the adjusted R^2 (Table 4, block 2). After entry of autonomous motivation in Block 3 the model as a whole explained 23% of the variance in total flow.

The R^2 change for the basic psychological needs were 15% (F Change (3, 139) = 8.58, $p \leq .001$). For autonomous motivation the R^2 change was 4% (F Change (1, 138) = 7.14, $p \leq .01$), meaning that autonomous motivation explained an additional 4% of the variance in total flow when the effects of sex and the basic psychological needs were statistically controlled for.

Table 4. Hierarchical multiple regression analysis. The dependent variable is total flow.

	B	SE B	β	R^2	ΔR^2
Block 1:				.07	.07***
(Constant)	45.52	.90			
Sex	-4.42	1.32	-.27***		
Block 2:				.20	.15***
(Constant)	40.50	1.38			
Sex	-3.07	1.27	-.19*		
Relatedness	2.18	1.31	.13		
Autonomy	.92	1.31	.06		
Competence	5.12	1.34	.31***		
Block 3:				.23	.04**
(Constant)	39.71	1.38			
Sex	-2.82	1.25	-.17*		
Relatedness	1.95	1.28	.12		
Autonomy	-.02	1.33	-.00		
Competence	3.84	1.40	.24**		
Autonomous Mot.	3.73	1.40	.23**		

Adjusted R Square has been applied

$p < .001$ ***

$p < .01$ **

$p < .05$ *

6.4 Hierarchical multiple regression analysis split by sex

Hierarchical multiple regression was also done split by sex to assess whether there were sex differences in the association between the basic psychological needs, autonomous motivation, and total flow.

In the first block (Table 5, Block 1), total flow was regressed on the basic psychological needs. For girls relatedness ($p \leq .05$) and competence ($p \leq .05$) statistically significantly predicted experiencing flow with beta coefficients of .27 for both. For boys only competence statistically significantly predicted experiencing flow ($p \leq .001$) with a beta coefficient of .41.

In the last block autonomous motivation was entered in the model. For girls, autonomous motivation statistically significantly predicted experiencing flow ($p \leq .01$) with a beta coefficient of .44. Of the basic psychological needs only relatedness still statistically significantly predicted experiencing flow ($p \leq .01$) with a beta coefficient of .23. For boys, autonomous motivation did not statistically significantly predict experiencing flow. Further, the coefficient of competence was practically unchanged from Block 3 to Block 4 (-.03), indicating that despite the effect of autonomous motivation, the relationship between perceived competence and total flow was robust.

For girls Block 1 explained 13% of the total variance in total flow measured by the adjusted R^2 . For boys Block 1 explained 16% of the total variance in total flow.

After entry of autonomous motivation in Block 2 the model as a whole explained 25% of the variance in total flow for girls measured by the adjusted R^2 . For boys, Block 2 explained 15% of the variance in total flow, which is a small decline from Block 1. Since autonomous motivation did not contribute significantly to the experience of flow for boys, the R^2 in Block 2 is not relevant.

For girls, the R^2 change for the basic psychological needs was 17% (F Change (3, 63) = 4.39, $p \leq .01$). For autonomous motivation the R^2 change was 12% (F Change (1, 62) = 10.91, $p \leq .01$), which means that autonomous motivation was able to explain an additional 12% of the variance in total flow for girls when the effects of relatedness, autonomy and competence were statistically controlled for.

For boys, the R^2 change for the basic psychological needs was 19% (F Change (3, 73) = 5.77, $p \leq .001$). Autonomous motivation was not able to explain any of the variance in total flow for boys.

Table 5. Sex specific hierarchical multiple regression analysis. The dependent variable is total flow.

	Girls					Boys				
	B	SE B	B	R^2	ΔR^2	B	SE B	β	R^2	ΔR^2
Block 1:				.13	.17**				.16	.19***
(Constant)	36.55	1.80				41.72	1.53			
Relatedness	4.58	2.03	.27*			-.50	1.65	-.03		
Autonomy	.54	2.10	.02			1.29	1.54	.09		
Competence	4.76	2.17	.27*			5.85	1.61	.41***		
Block 2:				.25	.12**				.15	.00
(Constant)	35.91	1.64				41.48	1.60			
Relatedness	4.04	1.91	.23*			-.56	1.66	-.04		
Autonomy	-1.87	2.17	-.11			1.10	1.59	.08		
Competence	1.81	2.25	.10			5.	1.69	.39**		
Autonomous Mot.	7.64	2.31	.44**			.94	1.66	.07		

Adjusted R Square has been applied

$p \leq .001$ ***

$p \leq .01$ **

$p \leq .05$ *

6.5 Two-way between-groups analyses of variance

To test the sex differences further a two-way between-groups analyses of variance was applied. ANOVA makes it possible to look at the individual and joint effect of two independent variables on one dependent variable. In this case the dependent variable was total flow and the independent variables were sex, the basic psychological needs, and autonomous motivation.

The analyses explored the impact of sex and competence, sex and autonomy, sex and relatedness, and sex and autonomous motivation on levels on total flow.

The interaction effect between sex and competence was not statistically significant ($F(1, 146) = .03, p = .86$), meaning there was no significant difference in the effect of competence level on flow experience for boys and girls. The main effects for both sex ($F(1, 146) = 8.34, p \leq .01$) and competence ($F(1, 146) = 22.81, p \leq .001$) were statistically significant. According to Cohen (1988) the effect size for sex was medium (partial eta squared = .05) and large for competence (partial eta squared = .14),

The interaction effect between sex and autonomy was not statistically significant ($F(1, 150) = .03, p = .86$). There were statistically significant main effects for both sex ($F(1, 150) = 13.94, p \leq .001$) and autonomy ($F(1, 145) = 5.96, p \leq .05$). The effect sizes were .09 and .04 respectively indicating that there is a difference in sex in terms of experiencing flow, and a difference between low and high autonomy in experiencing flow.

Also, for sex and relatedness the interaction effect was not statistically significant ($F(1, 147) = 2.42, p = .12$). There were statistically significant main effects for both sex ($F(1, 147) = 11.86, p \leq .001$) and relatedness ($F(1, 147) = 6.47, p \leq .05$). The effect sizes were .08 and .04 respectively, indicating that there is a difference in sex in terms of experiencing flow, and a difference between low and high relatedness in experiencing flow.

The interaction effect between sex and autonomous motivation was statistically significant ($F(1, 140) = 4.13, p \leq .05$), meaning there was a significant difference in the effect of autonomous motivation level on flow experience for boys and girls. The difference in means for low and high autonomous motivation for boys was small whereas the difference in means for low and high autonomous motivation for girls was big indicating that low autonomous motivation for girls seems to matter more for the level of flow they report compared to what low autonomous motivation means for boys. However, according to Cohen (1988) the Partial Eta Squared had a small effect (.03) indicating that the interaction effect might have little practical relevance. The main effects were not interpreted due to the significant interaction effect.

7.0 Discussion

7.1 Summary of the main results

This study examined to what extent senior high school students reported flow experiences in PE. Further, the study investigated the association between satisfaction of the basic psychological needs, autonomous motivation and the experience of flow in PE.

The results showed that 65.8% of the students experienced flow in PE with more boys than girls reporting to experience flow. Moreover, the basic psychological needs and autonomous motivation were positively and statistically significantly correlated with total flow for the entire sample. For the sample split by sex, autonomy no longer correlated with total flow. The strongest correlations were found between autonomous motivation and flow for girls, and between self-perceived competence and flow for boys. The independent variables in the final model explained 25% and 15% of the variance in total flow for girls and boys respectively. Autonomous motivation had the largest contribution in the explained variance for girls, and self-perceived competence had the largest contribution for boys. Further analyses explored the possible moderating effects of sex on the relationships between the basic psychological needs, autonomous motivation and the experience of flow. No such effects were found between the basic psychological needs and sex. Only a small interaction effect between autonomous motivation and sex was found, but the effect was very small indicating it might have little practical implication. Hence, the results from the interaction effect analyses will not be discussed further.

The present study contributes to a growing body of research on the relationship between satisfaction of basic psychological needs and the experience of flow in PA. This is in itself important in light of gaining a better understanding of what facilitates positive experiences in PA.

Moreover, the present study's focus on the PE setting is of special importance, as this setting for PA is understudied in terms of the relationship between basic psychological needs and flow. It is evident from the main findings of the study that PE is a context in which it is possible to have positive experiences of PA, and that the satisfaction of at least some of the basic psychological needs, as well as being intrinsically motivated is important for these positive experiences. In continuation, various aspects of the results will be discussed

7.2 Flow in PE

The amount of flow reported among the Norwegian high schoolers in this study can, according to previous studies on flow, be characterized as high (Reinhardt, Lau, Hottenrott, & Stoll, 2006; Reinhardt et al., 2008). PE is regarded as one of the more popular subjects in the Norwegian school system, and this may partly explain the high prevalence of flow reported. This is in line with Säfvenbom and colleagues' (2014) recent study on students' attitudes towards PE, which showed that most students reported high levels of enjoyment in PE. This finding is positive showing that there is potential in PE for the experience of flow.

Further, the results of the present study are consistent with other studies using the same flow measurement, with regards to the participants' reports of the experience of flow (Elbe, et al., 2010). The participants in Elbe and colleagues (2010) intervention study engaged in team and individual sports similar to those carried out in PE lessons. However, the results of the intervention study are still somewhat difficult to compare to the results of the current study due to noteworthy differences. Given that the flow experience occurs through a balance between a person's skills and the challenge at hand, it seems likely that flow would occur more easily in Elbe and colleagues' (2010)

intervention groups than in the PE sample since the participants in the intervention study were more or less on the same strength and fitness levels when starting the exercise intervention. The PE students in the present study, however, represented a less homogenous group. Most likely the students engaged in different activities at different levels in their leisure time affecting their perception of the level of difficulty of the activities in PE very differently (Green, 2012; Ntoumanis, 2001; Säfvenbom, et al., 2014). Hence, theoretically it would make it hard for all the students to feel optimally challenged when they engage in the same activity in PE.

Although a high proportion of the students reported experiencing flow, it is also important to emphasise that a relatively large proportion of the student body (34.2%) in the present study did not report to experience flow. More girls than boys belonged to this group of students. Also, Säfvenbom and colleagues (2014) found sex differences in their study on high school PE, with more than 50% of the females reporting that they disliked PE or felt that the subject should be provided differently. The explanation to the findings of sex differences in reported flow in PE can be found in PE's historical development from single sex PE to mixed sex PE. Flintoff and Scraton (2005) stated that even if mixed sex PE was introduced to limit gender inequalities, this did not happen. The activities offered in mixed sex PE are often traditional "boys" activities in which girls have less experience and skills. (Flintoff & Scraton, 2005). Also, With-Nielsen and Pfister (2011) emphasised that "PE, with its focus on games and performances, meets the requirements and expectations of many boys but contributes to the decrease in sporting interests and activities among numerous girls" (With-Nielsen & Pfister, 2011, p. 645). If girls feel less skilled when participating in PE together with boys who are generally stronger and faster than them, mixed sex PE will most likely affect girls' possibility of experiencing flow, and also their experience of PE in general.

Since the purpose of PE is to inspire students for lifelong participation and enjoyment of PA, and since PA level seems to decline at a greater rate for girls during the teenage years than for boys (Kjønniksen, et al., 2008; Kollé, et al., 2012; Pilgaard, 2008, 2009; Samdal, et al., 2009), the findings of the present study could be an indication that PE should be organised differently in order to facilitate for positive experiences for girls as well as for boys.

7.3 Satisfaction of the basic psychological needs in PE

The students in the present study reported to feel highly related to one another, whereas the students' responses for the satisfaction of the need for autonomy and competence varied more. All the basic needs were statistically significantly related to the experience of flow for the sample overall.

The results of the present study are to some extent in accordance with the findings of Kowal and Fortier's (1999) study of master's-level swimmers. Kowal and Fortier (1999) found that perceptions of autonomy, competence, and relatedness were positively related to the experience of flow with competence and relatedness having the strongest correlations with flow as in the present study. The basic psychological needs are the determinants of intrinsic motivation, but the findings of the present study, as well as the study of Kowal and Fortier (1999), suggest that the basic psychological needs can act as antecedents of flow as well. Hence, the results of the two studies seem to indicate the shared similarities between intrinsic motivation and flow.

However, Kowal and Fortier (1999) did not include analyses focusing on sex differences. The present study revealed different relationships between the basic psychological needs and flow for the correlation analysis split by sex. Further, the regression analysis split by sex in the present study

showed that relatedness and competence significantly predicted experiencing flow for girls, whereas only competence predicted the experience of flow for boys. When autonomous motivation was included in the model competence no longer predicted flow for girls, while autonomous motivation did not affect the model for boys. These sex differences will be discussed in the following sections.

7.3.1 The importance of competence for the experience of flow and sex differences

The results of the present study showed a positive relationship between perceived competence and the experience of flow. This relationship seems plausible since flow is thought to occur when there is a clear balance between challenge and skills (Moneta & Csikszentmihalyi, 1996), and since the need for competence leads people to seek challenges that are optimal for their capacities (Deci & Ryan, 2002b).

The results of the present study revealed significant sex differences in the need for competence, with more boys having higher perceptions of their competence than girls, which is in accordance with previous research in both PE specifically (Sollerhed, Apitzsch, Råstam, & Ejlertsson, 2008) and PA in general (Bagøien, et al., 2010; Frederick-Recascino, 2002; Klomsten, Marsh, & Skaalvik, 2005). Further, self-perceived competence had the largest contribution in the explained variance in flow for boys.

As the sex differences in the experience of flow was explained by previous research referring to how PE both with regards to its content and its organisation make a better fit with boys than girls' preferences (Sollerhed, et al., 2008), this may also partly explain the sex differences concerning competence. However, since research shows that sex differences in self-perceived competence exist in both PE and PA in general, it seems as if it is not only the content and

organisation of PE as subject that affect boys' and girls' perceptions of competence. Historically, sport, and competitive sport in particular, are considered to be a male activity (Larsson, 2014), and research shows that gender stereotyping within the sport domain still exists (Klomsten, et al., 2005). The results of a study of 357 high school students revealed that boys and girls differed in their perceptions of masculine and feminine values in sport and PE (Klomsten, et al., 2005). Boys valued endurance, strength, and masculinity as important values more than girls did. Whereas, girls valued a slender appearance, and femininity significantly more than boys did. Further, girls and boys were involved in gendered sports at different rates, and more girls than boys seemed to hold stereotyped opinions about appropriate sports for boys and girls (Klomsten, et al., 2005). Säfvenbom and colleagues (2014) emphasised that PE in Norway is very much influenced by organised youth sports and is dominated by a sports discourse. Therefore, the gendered stereotypes that exist in sport seem to be present in PE as well, and it is likely that this also affects girls' and boys' experiences in PE differently.

However, when analysing sex differences it is important to consider that there are differences also among males and among females, since they are not homogeneous groups. Some girls are involved in competitive sport in their leisure-time, and research shows that these girls reported higher enjoyment in PE than girls who were not involved in competitive sports (Säfvenbom, et al., 2014). On the contrary, "boys who do not "fit" the ideal of athletic, sporting masculinity also face negotiations and resistances in their experiences of PE." (Scraton, 2013, p. 205). The sex differences discovered in the present study should be considered in relation to the possibility that PE has a sports discourse, and that both girls and boys might differ in their prior experience in PA, which affect their experience of PE.

7.3.2 The need for relatedness and its effect on girls' experiences of flow

Loss of reflective self-consciousness is one of the characteristics of the flow experience (M. Csikszentmihalyi, 1975). When you feel related to the people around you it might be easier to let go and lose your reflective self-consciousness, and thereby achieve flow more readily. Whereas Kowal and Fortier (1999) found that swimmers who felt most connected with teammates reported the highest levels of flow, the present study revealed that relatedness only affected the experience of flow for girls in PE. The girls also felt less competent, and it is therefore possible that they were more vulnerable to embarrassment and discomfort in PE. This could explain why girls are more in need of peer acceptance and relatedness for flow to occur than boys. In this case, the influence of the needs for competence and relatedness on the flow experience seems intertwined.

7.3.3 The need for autonomy might depend on expectations

In the present study, the need for autonomy was not significantly correlated to the experience of flow for neither girls nor boys. Seifert and Hedderson (2010) made some interesting reflections about the need for autonomy and flow in their study of skateboarders. They were interested in exploring whether central constructs of SDT, specifically autonomy and competence, played a role in understanding flow. Seifert and Hedderson (2010) found that freedom and autonomy were one of the reasons for the skateboarders to engage in the activity for many hours daily. Autonomy allowed the skateboarders to make their own choices and set challenges appropriate for their skill level. Although, the qualitative methodology used in Seifert and Hedderson's study (2010) makes it impossible statistically to say anything about the relationship between autonomy and flow, the results are interesting in relation to the present study. Csikszentmihalyi states that flow is generally reported when a person is actively involved in his or her favourite activity (M. Csikszentmihalyi,

1975). This often entails that the activity is self-initiated through an autonomous decision made by the individual. It is therefore interesting that in the present study, such a high proportion of the student body experienced high levels of flow, even though the need for autonomy was not a statistically significant predictor of flow. Compared to Seifert and Hedderson's study (2010) the explanation to the different findings might have to do with expectations. The skateboarders were chosen as a group to study because there is no externally regulating structure of the activity. The skateboarders seem to engage inherently intrinsically, and the activity seems to be the skateboarders' favourite activity (Seifert & Hedderson, 2010). Contrary, students in PE classes participate mandatorily, and they might not have expectations to make own choices and initiate own actions in PE. However, the present study shows that flow can still be experienced in a setting with less room for autonomy, indicating that context is important, and that expectations of whether individuals will have autonomy or not, may play a role in the experience of flow. Further, as Seifert and Hedderson (2010) highlight, even if certain elements of SDT is present in Csikzentmihalyi's definition of flow, the elements of SDT are not necessary conditions for flow to occur as the findings of the present study also suggest.

7.4 Autonomous motivation and flow in PE

Most of the students in the present study reported feeling highly autonomously motivated for PE. They reported to participate and make an effort in PE because PE was fun, and because they wanted to learn and understand PE. Moreover, autonomous motivation was statistically significantly correlated with flow. This positive and significant relationship was expected due to the theoretical reasoning with flow being a motivational outcome (Fortier & Kowal, 2007; Seifert & Hedderson, 2010). Further, Deci and Ryan (1985) state that theoretically an individual who is

intrinsically motivated is more likely to experience flow because he or she is more interested in the activity.

For the entire sample, the basic psychological needs explained 20% of the variance in flow. After entry of autonomous motivation the model as a whole explained 23% of the variance in flow. However, only self-perceived competence of the basic psychological needs remained statistically significant after entry of autonomous motivation. The regression analysis split by sex showed that the associations between the different constructs of SDT and the experience of flow is a lot more complex than first assumed, and sex segregated analyses are therefore important in order to understand the mechanisms better.

For the boys, self-perceived competence had the largest contribution in the explained variance of flow. Self-perceived competence predicted the experience of flow for girls in the first model of the regression analysis, but this relationship became non-significant when autonomous motivation was entered into the model. For the model overall autonomous motivation had the largest and only statistically significant contribution in the explained variance of flow for girls. As SDT and flow theory propose a causal pattern between satisfaction of basic psychological needs, autonomous motivation and flow, it is theoretically sound to view autonomous motivation as a mediating factor between basic psychological needs and flow. In light of the results of the present study, it could be that intrinsic motivation mediates the relationship between self-perceived competence and the experience of flow for girls, whereas for boys there is a direct effect of self-perceived competence on the experience of flow. To get a truer picture of the motivational processes and the possible mediating role of autonomous motivation more advanced analyses are needed. This was however beyond the scope of this study.

Previous research has investigated these motivational mechanisms empirically. Although not directly related to the PE context with flow as the main outcome, previous studies have tested a motivational process proposed by Vallerand (1997): “social factors → psychological mediators → types of motivation → consequences” (Standage, et al., 2005, p. 72), which empirically has been supported (Ntoumanis, 2001; Standage, et al., 2005). Need satisfaction has been found to be a mediator between need-supporting environment and the autonomous types of motivational regulations resulting in positive outcomes. Also, a direct link between the basic psychological needs and the positive outcomes have been found (Ntoumanis, 2001; Standage, et al., 2005). It is conceivable that this motivational process also would apply to the present study with the experience of flow as a positive consequence. However, both Ntoumanis (2001) and Standage (2005) found the models to be largely invariant across gender which is in accordance with both flow theory and SDT as the theories are said to be universal. Yet, SDT stresses as well, that the basic needs “may be expressed and satisfied in different ways within different cultural contexts or by people at different ages or of different genders” (Deci & Ryan, 2002c, p. 435). It could be that in a PE context, girls and boys differ in how social factors (e.g. autonomy support) affect the satisfaction of the basic psychological needs which in turn influence degree of autonomous motivation and levels of flow. This was, however, not tested in the present study.

7.5 Limitations and suggestions for future research

The concept of flow is theoretically clearly defined, but the operationalization of the concept challenges research in the field, and there is therefore, a certain level of disagreement among researchers as to how flow should be measured (Moneta, 2012). As Rheinberg et al. (2003) emphasise, the flow experience happens when people are so dedicated to what they are doing that

they are totally absorbed in the activity. Ideally, flow should be measured in this very moment. However, it is not possible to reflect on one's behaviour while being in the flow state. Thus, when the experience is over, it can be hard to describe the experience in retrospect. The measurement challenge related to flow research was also of concern in this study. Further, flow was only measured once, although, multiple measurements of the same individual could have given a truer picture of the students' average level of flow in PE. Considering the circumstances and resources at hand, the best available and validated method of measuring flow was used.

In addition, the experience of flow is a subjective feeling composed of the aforementioned components, which all have to be present in order for flow to occur. In the measure of flow, these components have to be included for flow to be validly captured, and the FKS covers all the components (Engeser, 2012). However, the respondents may report a high score on some components and medium or low on other components. Still, their total flow score will be high. In the present study the means for items 3 (I don't notice time passing, $M = 3.9$) and 10 (I'm completely lost in thoughts, $M = 2.85$) were low compared to the other items. In addition, Rheinberg (2004) stresses that even if the components are present it is hard to say whether the flow state is present or not. He reasons that the ESM mostly measures "positive experiences" and not specifically flow (Rheinberg, 2004). Since the FKS is derived from the ESM it seems likely that the aforementioned reasoning also applies for this scale. In line with Rheinberg's (2004) reasoning, the results from this study could be regarded as positive experiences more than actual flow experiences. Future research should also include qualitative research methods to uncover the underlying constructs of the flow experience in PE.

Another issue to consider is the fact that, besides internal factors, experiencing flow also depends on external factors (M. Csikszentmihalyi, 1990), and since the teacher and the contextual environment affect the students attending the same class their responses cannot be assumed to be

totally independent of each other. Given also that the motivational climate created by the PE teacher probably affects students' experience of flow, recruiting students from a larger group of PE teachers and controlling for clustering on the teacher level would give a truer picture of the factors predicting flow experience.

Finally, as described in the Methods chapter, the independent variables of relatedness and autonomous motivation were highly skewed, resulting in difficulty meeting the criteria of normal distribution. To overcome this problem, categorisation was applied. However, this does not entirely solve the problem of little variation in the distribution of scores. Hence, it is likely that the limitations with these measures could have affected the validity and reliability of the results. A study using a larger and more representative sample would be beneficial in this respect.

Despite these limitations the results of the present study have provided insight into the experience of flow in a PE setting. By utilising both flow theory and SDT the study has contributed to a field within SDT, flow theory, and PE, which is little explored. Further, the results of the present study confirm the relationship between the different constructs of SDT and the experience of flow found in previous research, and show that these also apply for a PE setting.

8.0 Practical implications

For flow to happen the balance between one's skills and the challenge level of the task is important. In combination with the results of the present study, it therefore seems reasonable to suggest that PE would benefit from being more individually tailored to each student's needs. This would allow each student the opportunity to set his or her own goals for the activities offered and the subject overall. This is vital because as suggested by Csikszentmihalyi (1990) even the simplest physical act can be enjoyable if it offers the right balance between challenge and mastery. Even though students are supposed to participate in the same activity in PE, e.g. soccer, it is possible for students to engage in the same activity with different goals. For one student the goal could be to be supportive of other students, while for another student, the goal could be to exert maximum effort and perform to the best of one's ability. Furthermore, each student must develop the skills needed in order to reach the goal, and also challenge oneself by raising the stakes if the activity becomes boring (M. Csikszentmihalyi, 1990). Csikszentmihalyi (1990) emphasize that the level of challenge and skills cannot be assessed objectively, instead it is about how the individual assesses the activity. This puts certain demands on the teacher to place more responsibility on the students to set individual goals and to reflect on the goals continuously. At the same time, the teacher must organize the activities in such a way that all students with different goals can participate.

In the present study the basic psychological needs were positively correlated with the experience of flow. The need for competence stood out by having the strongest correlation with the experience of flow for the sample overall, which theoretically is justifiable, as feeling of competence impact emotion and wellbeing making people seek out challenges optimal for their capacities (Deci & Ryan, 2002b). However, a variety of factors can affect whether or not an individual feel competent in a given situation. Compared to other subjects, such as Math and Language, students in PE are to a greater degree exposing their performance and skills to their

peers. In PE it is evident who masters the subject and who does not, and this may result in avoidance among students who do not feel very confident in their own PE abilities.

9.0 Conclusion

The association between SDT and flow theory in a PE setting is complex as the results of the present study show. However, this study has contributed to a field within SDT, flow theory, and PE, that is little explored. PE is an important subject that should give all children and adolescents the opportunity to explore and master the movements of the body. PE is to be connected with enjoyment, but for many students the subject is associated with negative experiences.

The results of the present study revealed that the majority of students experienced flow in PE. This finding is very positive showing that there is potential in PE for the experience of flow. As self-perceived competence was found to be the strongest predictor of the experience of flow for boys, and autonomous motivation was the strongest predictor of the experience of flow for girls it is appropriate to organise the subject in relation to these findings. However, a smaller proportion of the student body did not report to experience flow, and more girls than boys belonged to this group of students. Much indicates that PE is more adjusted to boys, an example from this study being that also self-perceived competence varied between the sexes with more boys reporting to feel competent.

Based on the results of the present study it seems reasonable to suggest that PE would benefit from being more individually tailored. If the subject was made more individually tailored with differentiated activities it would probably increase the likelihood that each student felt more competent at their own level. As a result, the experience of flow might happen more readily resulting in positive experiences in PE, which can have significant health benefits for the individuals and society.

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Appendix

Table 1. Descriptive statistics for categorical variables. Frequency and prevalence (%). Chi-square between sex and the categorical variables.

Variable	Frequency	Prevalence (%)	χ^2 ^a
Sex			
Males	89	53,3	
Females	78	46,7	
Autonomous motivation			
High	80	47,9	2.22
Low	73	43,7	
Competence			
High	81	48,5	5.98*
Low	80	47,9	
Autonomy			
High	89	53,3	.28
Low	77	46,1	
Relatedness			
High	99	59,3	3.69
Low	63	37,7	

a Yates' Correction of Continuity

The questionnaire:

Instruksjoner

Vennligst svar på alle spørsmålene så ærlig og nøye som mulig.

Husk at verken læreren din eller noen andre elever får se skjemaet etter at det er fylt ut. Det er heller ingen riktige eller gale svar, så svar slik du virkelig føler.

Mange av spørsmålene handler om dine erfaringer knyttet til kroppsøvingsfaget på skolen. Noen av spørsmålene kan virke veldig like. Det skal de også være.

På forhånd takk for hjelpen!

Helga Bjørnøy Urke

Phd-kandidat

Hemil-senteret, UiB

UiB

Hege E. Tjomsland

1. amanuensis

Institutt for pedagogikk,

1. Er du gutt eller jente?

Gutt

Jente

2. Hvilket programfag går du på?

Helse- og oppvekstfag

Medier og kommunikasjon

Naturbruk

Restaurant- og matfag

Service og samferdsel

Teknikk og industriell produksjon

Idrettsfag

Musikk, dans og drama

Studiespesialisering

Bygg- og anleggsteknikk

Design og håndverk

Elektrofag

3. Hvilken type aktivitet har du vært med på i denne kroppsøvingstimen:

Innebandy

Terrengløping

Sirkeltrening med musikk

Ballspill

Alternativ trening

Når du svarer på påstandene nedenfor skal du tenke på hvordan du følte deg i kroppøvingstimen du nettopp deltok i. Sett ring rundt det tallet som passer best for din opplevelse når du deltok i aktiviteten i timen.

Spørsmål		Stemmer ikke			-	Stemmer		
1	Jeg føler meg optimalt utfordret	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	Jeg kan tenke og bevege meg uten problemer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	Jeg legger slett ikke merke til at tiden går	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	Jeg har ingen problemer med å konsentrere meg	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	Jeg er helt klar i hodet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	Jeg er veldig oppslukt i det jeg gjør akkurat nå	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	De riktige tankene/bevegelsene kommer helt av seg selv	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	For hvert skritt vet jeg hva jeg skal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	Jeg føler at jeg mestrer bevegelsene	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	Jeg er helt i mine egne tanker	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11	Dette er viktig for meg	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12	Jeg kan ikke gjøre noen feil nå	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13	Jeg er redd for å mislykkes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Hvilken karakter fikk du i kroppsøving i første termin dette skoleåret?

- Ikke vurdert
- 1
- 2
- 3
- 4
- 5
- 6

5. Hvilken karakter fikk du i snitt første termin dette skoleåret?

- Ikke vurdert
- 1
- 2
- 3
- 4
- 5
- 6

Aktiviteter på fritiden

6. Utenom skoletid: Hvor mange GANGER i uka driver du idrett, eller mosjonerer du så mye at du blir andpusten og/eller svett?

- hver dag
- 4-6 ganger i uka
- 2-3 ganger i uka
- en gang i uka
- en gang i måneden
- mindre enn en gang i måneden
- aldri

7. Utenom skoletid: Hvor mange TIMER i uka driver du idrett, eller mosjonerer du så mye at du blir andpusten og/eller svett?

- Ingen
- 1/2 time
- 1 time
- 2-3 timer
- 4-6 timer
- 7 timer eller mer

8. **Utenom skoletid:** Hvor ofte er du fysisk aktiv eller trener sammen med en eller begge av foreldrene dine?

- 2-3 ganger i uken
- en gang i uken
- en gang i måneden
- mindre enn en gang i måneden
- aldri

9. Er du medlem i et idrettslag? Ja Nei

10. Hvis du ikke er medlem i et idrettslag, hva er grunnen til dette? Sett ett eller flere kryss i de boksene som passer for deg.

- det er for dyrt
- idrettsanlegget / klubben ligger for langt vekk hjemmefra
- aktivitetstilbudet passer ikke for meg
- jeg ikke har tid til å trene i en klubb / idrettslag
- ingen av vennene mine trener på i en klubb / idrettslag
- jeg liker ikke trenerne i klubben
- andre grunner

11. Er du medlem på et treningssenter? Ja Nei

12. Dersom du ikke er medlem på et treningssenter, hva er grunnen til dette? Sett ett eller flere kryss i de boksene som passer for deg.

- det er for dyrt
- treningssenteret ligger for langt vekk hjemmefra
- aktivitetstilbudet passer ikke for meg
- jeg ikke har tid til å trene på et treningssenter
- ingen av vennene mine trener på et treningssenter
- jeg liker ikke instruktørene på treningssenteret
- andre grunner

Deltakelse i kroppsøvingsfaget

13. Hvor ofte deltar du i kroppsøvingstimene?

- Hver gang
- Annenhver gang
- En gang i måneden
- En gang i halvåret
- Sjeldnere
- Aldri

14. Hvor ofte er du til stede i kroppsøvingstimene uten å delta?

- Hver gang
- Annenhver gang
- En gang i måneden
- En gang i halvåret
- Sjeldnere
- Aldri

15. Hvor ofte skulker du kroppsøvingstimene?

- Hver gang
- Annenhver gang
- En gang i måneden
- En gang i halvåret
- Sjeldnere
- Aldri

16. Hvis du ikke deltar i timen eller skulker, hva er årsaken til dette? Sett gjerne flere kryss dersom flere svaralternativ passer for deg.

- Jeg liker ikke aktiviteten vi skal jobbe med i timen
- Jeg har glemt gymtøyet
- Jeg liker ikke å dusje etter gymmen
- Jeg er ikke helt frisk
- Jeg er for trøtt til å delta
- Jeg må gjøre lekser eller lese til en prøve
- Andre grunner

Se nøye på hver av påstandene, og tenk på hvordan dette passer for deg i kroppsøvingstimene. Indiker på skalaen hvor enig eller uenig du er i påstandene. Når du svarer på disse spørsmålene, skal du tenke på slik du vanligvis har det i kroppsøvingstimene.

17. Jeg føler at læreren gir meg muligheter og valg

1. Sterkt uenig
- 2.
- 3.
- 4.
- 5.
- 6.
7. Sterkt enig

18. Jeg føler at læreren forstår meg

1. Sterkt uenig
- 2.
- 3.
- 4.
- 5.
- 6.
7. Sterkt enig

19. Læreren gjør meg trygg på at jeg klarer å gjøre det bra i timene

1. Sterkt uenig
- 2.
- 3.
- 4.
- 5.
- 6.
7. Sterkt enig

20. Læreren oppmuntrer meg til å stille spørsmål

1. Sterkt uenig
- 2.
- 3.
- 4.
- 5.
- 6.
7. sterkt enig

21. Læreren hører på hvordan jeg vil gjøre ting

1. Sterkt uenig
- 2.
- 3.
- 4.
- 5.
- 6.
7. Sterkt enig

22. Læreren prøver å forstå hvordan jeg ser ting, før han eller hun foreslår en ny måte

1. Sterkt uenig
- 2.
- 3.
- 4.
- 5.
- 6.
7. Sterkt enig

23. Kroppsøvingstimene passer i stor grad sammen med mine valg og interesser.

1. Ikke sant i det hele tatt
- 2.
- 3.
4. Noe sant
- 5.
- 6.
7. Veldig sant

24. Jeg føler sterkt at kroppsøvingstimene passer mitt ønske om fysisk aktivitet

1. Ikke sant i det hele tatt
- 2.
- 3.
4. Noe sant
- 5.
- 6.
7. Veldig sant

25. Måten kroppsøvingstimene er lagt opp på er helt klart et uttrykk for hvordan jeg ønsker timene skal være.

1. Ikke sant i det hele tatt
- 2.
- 3.
4. Noe sant
- 5.
- 6.
7. Veldig sant

26. Jeg føler sterkt at jeg har mulighet til å gjøre valg i forhold til hva jeg vil gjøre i kroppsøving

1. Ikke sant i det hele tatt
- 2.
- 3.
4. Noe sant
- 5.
- 6.
7. Veldig sant

27. Jeg føler jeg har stor fremgang i forhold til målet mitt med kroppsøvingstimene

1. Ikke sant i det hele tatt
- 2.
- 3.
4. Noe sant
- 5.
- 6.
7. Veldig sant

28. Jeg føler jeg utfører øvelsene i timene veldig effektivt

- 1 Ikke sant i det hele tatt
- 2
- 3
- 4 Noe sant
- 5
- 6
- 7 Veldig sant

29. Jeg føler at kroppsøving er noe jeg får godt til

1. Ikke sant i det hele tatt
- 2.
- 3.
4. Noe sant
- 5.
- 6.
7. Veldig sant

30. Jeg føler jeg klarer de oppgavene lærer legger opp til i kroppsøvingstimene

- 1 Ikke sant i det hele tatt
- 2
- 3
- 4 Noe sant
- 5
- 6
- 7 Veldig sant

31. Jeg føler meg vel sammen med de andre elevene

- 1 Ikke sant i det hele tatt
- 2
- 3
- 4 Noe sant
- 5
- 6
- 7 Veldig sant

32. Jeg føler jeg kan omgås de andre elevene på en vennlig måte

- 1 Ikke sant i det hele tatt
- 2
- 3
- 4 Noe sant
- 5
- 6
- 7 Veldig sant

33. Jeg føler jeg har god og åpen kommunikasjon med de andre elevene

- 1 Ikke sant i det hele tatt
- 2
- 3
- 4 Noe sant
- 5
- 6
- 7 Veldig sant

34. Jeg føler meg veldig fortrolig med de andre elevene

- 1 Ikke sant i det hele tatt
- 2
- 3
- 4 Noe sant
- 5
- 6
- 7 Veldig sant

35. Jeg føler meg utfordret i kroppsøvingstimen.

- 1 Ikke sant i det hele tatt
- 2
- 3
- 4 Noe sant
- 5
- 6
- 7 Veldig sant

Hvor sanne eller usanne er følgende påstander for deg?

36. Jeg føler meg trygg på mine ferdigheter til å utøve fysisk aktivitet i fritiden

1	2	3	4	5	6	7
Ikke sant i det hele tatt			Noe sant			Veldig sant

37. Jeg klarer å mestre mine fysiske aktiviteter i fritiden

1	2	3	4	5	6	7
Ikke sant i det hele tatt			Noe sant			Veldig sant

38. Jeg klarer å nå målene jeg setter meg for fysisk aktivitet i fritiden

1	2	3	4	5	6	7
Ikke sant i det hele tatt			Noe sant			Veldig sant

39. Jeg føler meg i stand til å kunne møte utfordringene fysisk aktivitet gir meg i fritiden

1	2	3	4	5	6	7
Ikke sant i det hele tatt			Noe sant			Veldig sant

40. I løpet av den siste måneden....

- følte jeg meg opplagt meget enig litt enig litt uenig helt uenig
- var jeg i godt humør meget enig litt enig litt uenig helt uenig
- gledet jeg meg til hver dag meget enig litt enig litt uenig helt uenig
- følte jeg meg kvikk og våken meget enig litt enig litt uenig helt uenig
- hadde jeg masse energi meget enig litt enig litt uenig helt uenig

Hvorfor deltar du i aktiviteten i kroppsøvingstimene?

41. Jeg deltar i aktiviteten fordi læreren skal tro jeg er flink elev.

meget enig litt enig litt uenig helt uenig

42. Jeg deltar i aktiviteten, men jeg lurar på hvorfor jeg fortsetter å delta

meget enig litt enig litt uenig helt uenig

43. Jeg deltar fordi jeg får bråk om jeg lar være.

meget enig litt enig litt uenig helt uenig

44. Jeg deltar fordi det er gøy.

meget enig litt enig litt uenig helt uenig

45. Jeg deltar fordi jeg vil få dårlig samvittighet om jeg lar være.

meget enig litt enig litt uenig helt uenig

46. Jeg deltar selv om jeg egentlig ikke vet hvorfor jeg gjør det

meget enig litt enig litt uenig helt uenig

47. Jeg deltar fordi jeg vil lære og forstå kroppsøving.

meget enig litt enig litt uenig helt uenig

48. Jeg deltar fordi det forventes av meg.

meget enig litt enig litt uenig helt uenig

49. Jeg deltar men jeg lurar på hva poenget med det er

meget enig litt enig litt uenig helt uenig

50. Jeg deltar fordi jeg liker kroppsøving.

meget enig litt enig litt uenig helt uenig

51. Jeg deltar fordi kroppsøving er viktig for meg.

meget enig litt enig litt uenig helt uenig

52. Jeg deltar selv om jeg ikke aner hvorfor lenger

meget enig litt enig litt uenig helt uenig

B. Hvorfor står du på i kroppsøvingstimene?

54. Jeg står på fordi læreren ikke skal skjenne på meg.

meget enig litt enig litt uenig helt uenig

55. Jeg står på fordi læreren skal tro jeg er en flink elev.

meget enig litt enig litt uenig helt uenig

56. Jeg står på fordi jeg ønsker å lære nye ting.

meget enig litt enig litt uenig helt uenig

57. Jeg står på fordi jeg ville skamme meg om jeg ikke gjorde det.

meget enig litt enig litt uenig helt uenig

58. Jeg står på fordi det er gøy.

meget enig litt enig litt uenig helt uenig

59. Jeg står på fordi det er en regel som sier jeg må gjøre det.

meget enig litt enig litt uenig helt uenig

60. Jeg står på fordi jeg liker aktivitetene.

meget enig litt enig litt uenig helt uenig

61. Jeg står på fordi det er viktig for meg.

meget enig litt enig litt uenig helt uenig

Spørsmål om din familiebakgrunn

62. Hvilket land kommer din mor fra?

Norge	<input type="checkbox"/>	Asia	<input type="checkbox"/>
Sverige	<input type="checkbox"/>	USA	<input type="checkbox"/>
Andre Europeiske land	<input type="checkbox"/>	Sør Amerika	<input type="checkbox"/>
Afrika	<input type="checkbox"/>	Vet ikke	<input type="checkbox"/>

63. Hvilket land kommer din far fra?

Norge	<input type="checkbox"/>	Asia	<input type="checkbox"/>
Sverige	<input type="checkbox"/>	USA	<input type="checkbox"/>
Andre Europeiske land	<input type="checkbox"/>	Sør Amerika	<input type="checkbox"/>
Afrika	<input type="checkbox"/>	Vet ikke	<input type="checkbox"/>

64. Hvor god økonomi har din familie?

svært god	<input type="checkbox"/>
god	<input type="checkbox"/>
middels god	<input type="checkbox"/>
ikke særlig god	<input type="checkbox"/>
dårlig	<input type="checkbox"/>

Tusen takk for hjelpen!