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PhD Dissertation

TEACHERS' AND COACHES' MOTIVATION TO PARTICIPATE IN TRAINING AND THE IMPLEMENTATION OF EDUCATIONAL INNOVATIONS

by

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Dedication

To the memory of my father; to my mother, and to my brightest stars and most significant persons in my life: my beloved life partner, ***Ioanna Kefallinou-Tzinieri****, and my two precious treasures,* ***Natalia*** *and* ***newborn babygirl Gorozidou****. I feel blessed and grateful for having you in my life, through your encouragement, patience and love, I am able to succeed in life.*

Contents

PhD's publications list[1]

Pub. No.	Year	Reference	Type of publication
1.	**2011**	Gorozidis, G., & Papaioannou, A. G. (2011). The significance of teachers' self-determination for their in-service training. The case of Physical Education teachers. *Review of Educational Issues, 17*, 273-298, Pedagogical Institute, Athens (In Greek). Γοροζίδης, Γ., & Παπαϊωάννου, Α. (2011). Η σημασία του αυτό-καθορισμού των εκπαιδευτικών στα προγράμματα επιμόρφωσής τους: Η περίπτωση των εκπαιδευτικών φυσικής αγωγής. *Επιθεώρηση Εκπαιδευτικών Θεμάτων, 17*, 273-298. Παιδαγωγικό Ινστιτούτο, Αθήνα.	Paper *Literature Review*
2.	**2014**	Gorozidis G, Tzioumakis Y., Papaioannou A., Krommydas C. (2014). *Youth football coaches' self-determination to participate in professional training promoting innovative/empowering coaching*. Proceedings of the 13th Conference of Sport Psychology, "Psychology in Sports and Education" (pp. 118-124), Trikala, Greece.	Short Paper *Study 1*
3.	**2012**	Gorozidis, G., & Papaioannou, A. (2012). *Initial validation of the "Work Tasks Motivation Scale for Teachers" - Greek version (WTMST-GR)*. Proceedings of the 20th International Conference of Physical Education and Sports, Democritus University of Thrace-D.P.E.S.S. (Short papers, Section: Sports Psychology, pp. 3-7), Komotini, Greece.	Short paper *Study 2 Pilot 1*
4.	**2014**	Gorozidis, G., & Papaioannou, A. (2014). Teachers' motivation to participate in training and to implement innovations. *Teaching & Teacher Education, 39, 1-11.*	Paper *Study 3*
5.	**2015**	Gorozidis, G., & Papaioannou, A. (2015, submitted). Teachers' achievement goals and self-determination to engage in work tasks promoting educational innovations.	Submitted Paper *Study 4*
6.	**2012**	Gorozidis, G., Papaioannou, A. G., & Diggelidis, N. (2012). Physical educators' self-efficacy in the implementation of the new curriculum for the "New school- the school of the 21st century". *Inquiries in Sport &Physical Education, 10*(2), 91-101 (In Greek). Γοροζίδης, Γ., Παπαϊωάννου, Α. & Διγγελίδης, Ν. (2012). Αυτό-αποτελεσματικότητα εκπαιδευτικών φυσικής αγωγής στην εφαρμογή του νέου προγράμματος σπουδών για το «Νέο Σχολείο - Σχολείο 21ου αιώνα». *Αναζητήσεις στη Φυσική Αγωγή & τον Αθλητισμό, 10*(2), 91-101.	Paper *Study 5*
7.	**2014**	Gorozidis, G., Papaioannou, A. G., & Diggelidis, N., Syrbas I (2014). *Validation evidence of the scale "self-efficacy in teaching physical education curriculum standards"*. Proceedings of the 13th Conference of Sport Psychology, "Psychology in Sports and Education" (pp. 147-151), Trikala, Greece.	Short Paper *Study 5 Pilot 2*

[1] For sample pages of each publication see Appendix III

Author's previous studies on teachers' motivation - Publication list

Pub. No.	Year	Reference
1.	**2011**	Gorozidis, G., & Papaioannou, A. (2011). Teachers' self-efficacy, achievement goals, attitudes and intentions to implement the new Greek physical education curriculum. *European Physical Education Review, 17*(2), 231-253.
2.	**2011**	Gorozidis, G., Tzioumakis, Y., & Papaioannou, A. (2011). *Utilizing the theories of planned behavior and self-efficacy, to explain physical education teachers' behaviors and their intentions to implement a new curriculum*. Proceedings of the 13th European Congress of Sport Psychology "Human Performance, Well being and Health", (pp. 279-280). Madeira, Portugal.
3.	**2010**	Gorozidis, G., & Papaioannou, A. (2010). *Physical educators' achievement goals and self-efficacy in the implementation of the new greek national curriculum*. Proceedings of the 11th International Conference of Sport Psychology "Promoting physical activity and psychological well being" & 6th ENYSSP Workshop 2010 (pp. 33-34). Trikala, Greece.
4.	**2012**	Gorozidis, G., & Gratsonidis, A. (2012). Investigation of Physical Education teachers' in-service training needs. Intentions and attitudes toward to training. *Kinesiology, Dedicated Issue*, 17-18. (In Greek) Γοροζίδης, Γ., & Γρατσωνίδης, Α. (2012). Διερεύνηση επιμορφωτικών αναγκών Εκπαιδευτικων Φυσικής Αγωγής. Προθέσεις και Στάσεις απέναντι στην επιμόρφωση. *Κινησιολογία*, *Αφιερωματικό Τέυχος*, 17-18.

List of Abbreviations

AGT	**Achievement Goals Theory**
CFA	**Confirmatory Factor Analysis**
MANOVA	**Multivariate Analysis Of Variance**
PAPA	**Promoting Adolescents Physical Activity**
PE	**Physical Education**
RM-ANOVA	**Repeated Measures-Analysis Of Variance**
SDT	**Self-Determination Theory**
SEM	**Structural Equation Modeling**
SET	**Self-Efficacy Theory**
TAGWQ	**Teachers Achievement Goals in Work Questionnaire**
TPB	**Theory Of Planned Behavior**
WTMST	**Work Tasks Motivation Scale**

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ABSTRACT

The purpose of the present PhD research was the in-depth examination of Greek teachers' and youth football coaches' work specific motivation regarding two work tasks promoting educational innovations; (a) participation in training and (b) implementing innovative practices. Drawing from social-cognitive psychology, two prominent theoretical frameworks of human motivation namely Self-Determination Theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2002) and Achievement Goals Theory (AGT; Ames, 1990; Dweck, 1986; Nicholls, 1984), guided this investigation in order to better explain and understand various aspects of participants' intentions, behaviors, beliefs and thoughts in real life situations. In order to examine theoretical hypotheses in diverse contexts and populations, four different purposefully selected samples of educators-instructors were invited to participate in the research. Specifically, participants were youth football coaches (n=15), pre-service physical education teachers (n=52), in-service secondary school teachers (n=287) and physical educators (n=92)[2] who were taking part in independent programs aiming at promoting instructional innovations.

To triangulate and to complement findings, multiple sources of data were utilized, such as face-to-face interviews, questionnaires, on-line surveys, open-ended questions, and email interviews. Thus, for the purposes of the present research a multiphase mixed methods design (Creswell & Plano Clark, 2011) was adopted (see Table 2, p. 56) in terms of data gathering and analyses, where multiple studies were conducted sequentially and concurrently, to inform one another and to answer three overarching research questions: (a) Why do some individuals decide to participate in training aiming to promote educational innovation? (b)Why are some educators more engaged than others with educational innovations? (c) How this involvement with instructional innovation might be fostered?

[2] The total sample of PE teachers that participated in this study was 149. From them 57 did not take part in the educational innovation program. Therefore, their data was used only to examine the factorial validity of a newly constructed instrument (see Ch. 5.3 Future directions study), and excluded from further analyses investigating motivational variables regarding teachers' engagement with innovation.

Cumulatively, the findings of the studies described below suggest that not only individual motivation plays a very important role in their work behaviors, but the quality of this motivation is the element that makes the difference. From quantitative and qualitative data it was evident that educators (i.e., secondary school teachers, PE teachers and youth football coaches) decide to participate in training programs promoting innovative instruction, primarily for autonomous intrinsic and well internalized extrinsic reasons, while non-autonomous extrinsic reasons may exist but in a much smaller extent and vigor. Furthermore it seems that the most autonomous motivated individuals are those who are mastery/learning oriented in their working behaviors, meaning that they embrace this kind of disposition in a variety of work tasks. In addition, educators' future intention for engagement with innovations was found to be determined only by their autonomous motivation and mastery goals orientation, and not by controlled motivations and performance goals. Nevertheless, it appeared that teachers may hold different beliefs about their capabilities (i.e., self-efficacy) to implement different aspects of an educational innovation. These findings suggest that during the design phase of an educational novelty/change, it would be meaningful apart from educators' motivation quality, to take into account their self-efficacy beliefs, as well. Hence, stemming from empirical evidence and the theoretical foundation of the present research, suggestions to foster teachers' and coaches' optimal involvement with innovative instruction include the establishment of a work environment for teachers, supporting and enhancing their mastery goals and autonomous motivations. According to the existing theory and research, this work climate must (a) emphasize personal development, effort expenditure and persistence, (b) constantly deliver opportunities for collaboration and experimentation, (c) provide frequently, corrective non-threatening feedback and support (e.g., by colleagues, superiors and experts).

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Chapter I GENERAL INTRODUCTION

In the global stage of schooling there is a constant effort for improvement of both the process and the outcome of education provided to the public. Aiming for these objectives, national educational systems are accustomed to promote instructional innovations, and to launch new curricula from time to time, in order to attain the widespread adoption of the new practices, when these becoming available. Educational innovation is defined as an informed change (by research and practice) in philosophy of teaching/learning, which leads in an adaptation of instructional practices that better promote educational objectives (De Lano, Riley, & Crookes, 1994, p. 489). In the educational literature innovation is characterized by at least one of the next key elements: *change, development, novelty, or improvement* (De Lano et al., 1994, p. 488). The importance of educational innovations for every contemporary system is undeniable and recent studies reveal that an essential factor for their success is educators' motivation to embrace the new philosophy and teaching practices (Abrami, Poulsen, & Chambers, 2004; Cave & Mulloy, 2010; Gorozidis & Papaioannou, 2011; Lam, Cheng, & Choy, 2010).

But what is motivation? Among a variety of existing definitions in the literature, here we espouse that motivation is *the internal and/or external forces that lead to the initiation, direction, intensity, and persistence of behavior* (Vallerand, 2004, p. 428), and that *the study of motivation concerns those processes that give behavior its energy (i.e., strength, intensity, persistence) and direction (i.e., aiming toward a goal)* (Reeve, 2009, p. 8). Following these propositions, the present PhD research is attempting to shed light on the motivational functioning of Greek educators (i.e., teachers, physical educators, youth football coaches) during the process and implementation of instructional innovations.

Hence, in order to examine theoretical hypotheses in real-life situations (i.e., not in experimental conditions) and in diverse contexts, multiple independent samples, tasks and situations were considered. Specifically, participants of this research comprised four different samples: (i) youth coaches working in private

football academies (10-14 years old children), (ii) pre-service physical education (PE) teachers, (iii) in-service teachers (public high schools), and (iv) PE teachers (public elementary schools & junior high school). In this dissertation we refer to coaches as educators, based on the acknowledgment of coach pedagogical role and the recognition of coaching as an educational endeavor (Cassidy, Jones, & Potrac, 2009; Jones, 2006, 2007).

Traditionally, efforts to implement educational change and innovative practices (e.g., curriculum, teaching methods) are introduced as mandated policy, and promoted through centrally organized professional development programs. This model of *top-down* reforms and their accompanying training programs have received lots of criticism regarding their power to influence practice (Darling-Hammond, 2005; Fullan, 2009; Hardman & Marshall, 2008; Wilson & Rossman, 1993), while coaches' training interventions have been also criticized for their effectiveness (Trudel, Gilbert, & Werthner, 2010). However, these strategies are still in use when decision makers are trying to commence a wide range reform and a typical case of this tradition is Greek context. In addition, there is a convergence of evidence that vital facilitators for effective implementation of innovations are individual educators' personal characteristics, cognitions, beliefs and thoughts regarding the innovation (Abrami et al., 2004; Curtner-Smith, 1999; Gorozidis & Papaioannou, 2011; Ross, 1994).

Educators in order to amend their instruction and to align with new pedagogical trends need to deliberately become lifelong learners and to participate in continuous training. Participants' intentional involvement with learning experiences is essential because high quality motivation to learn lead to high quality learning, engagement, psychological adjustment and achievement (Deci, Vallerand, Pelletier, & Ryan, 1991; Niemiec & Ryan, 2009; Reeve, 2002). Since the direct recipient of teachers' and coaches' work behaviors are children of critical developmental ages, improvement of educators' quality and instruction is of great significance for the fulfillment of their pedagogical role and children's optimal growth.

A robust framework for the research

Following suggestions for more systematic theory-driven research regarding teacher motivation (Richardson & Watt, 2010), and for a clear focus on situational and task specific motivations of teachers (Fernet, Senecal, Guay, Marsh, & Dowson, 2008) we

chose a well-established basis for the present research. The theoretical foundation for this dissertation comprises contemporary, well-established social-cognitive theories of motivation sharing an intentional perspective and focusing clearly on the quality of human motivation and its effect on life situations. The theories guided this research were Self- Determination Theory (SDT; Deci & Ryan, 1985), and Achievement Goals Theory (AGT; Nichols, 1989; Elliot & Church, 1997). Through the lenses of these frameworks there has been an attempt for in-depth examination and interpretation of psychological processes and characteristics of Greek educators that influence their decisions to participate in training programs and to adopt and implement innovative practices. These theories were considered as the most appropriate to base the present research on educators' motivation because (a) both theories have been extensively applied in various learning and achievement situations, tasks and contexts and are sufficient to provide practical solutions (Deci & Ryan, 2008; Papaioannou, Zourbanos, Krommidas, & Ampatzoglou, 2012; Reeve, 2002), (b) there is a theoretical connection in motivational constructs of the two theories and suggestions for their complementary use (Deci & Ryan, 2000; Dweck, 1986; Nicholls, 1984; Ryan & Deci, 1989), (c) there are robust empirical evidence of their linkages (Elliot & McGregor, 2001; Nien & Duda, 2008; Ntoumanis, 2001), (d) in both theories hierarchical models have been developed that have proved helpful for the examination-interpretation of motivation at the situational level (Elliot & Church, 1997; Papaioannou, 1999; Vallerand, 1997), and (e) the theoretical background of the researcher and prior experience was on this area (Gorozidis, 2009; Gorozidis & Papaioannou, 2011).

Research significance

Internationally, there is a gap in research investigating the situation specific motivation quality of educators who get involved with innovations, guided by prominent theories. Similarly, in the Greek context the available evidence about teachers and coaches is limited and the present research aims to contribute to the expansion of knowledge on these issues. The reality described above, highlights the importance of studying educators' motivation regarding their participation in formally-organized training programs promoting instructional innovations, and their motivation to implement and persist with innovation in every day practice. Exploring

teachers' and coaches' situation specific motivation will help us generate the appropriate answers on how to foster their active engagement with educational innovations in the future. The findings will improve our understanding of how Greek teachers and coaches think and behave so that future actions introducing educational innovations will have an increasing impact upon overt pedagogical practices. Also, future training programs will be able to incorporate the findings of this research in order to become more attractive and effective in recruiting more teachers and coaches as lifelong learners.

Aims

The main purpose of the present research was to investigate Greek educators' motivational processes with regard to different work tasks that promote educational innovations, (a) participation in training programs, and (b) implementation of innovative practices. The current research through the use of mixed methods design (quantitative - qualitative) was expected to provide new information and data regarding the motivation of specific professional groups and to give insights about their intentional behavior and psychological functioning.

Research Questions

Three overarching questions guided this research:

1. Why do some individuals decide to participate in training aiming to promote educational innovation?
2. Why are some educators more engaged than others with educational innovations?
3. How this involvement with instructional innovation might be fostered?

Based on these questions, theoretical foundation and literature review (presented in the next chapter), several sub-questions and research hypotheses were generated. For reasons of parsimony and comprehension these are presented in each study separately with regards to the situation of reference.

Novelty of research

The novelty of the present PhD is that combines different research methods qualitative-quantitative, and incorporates multiple purposefully selected samples, to investigate theoretical hypotheses in authentic settings. Until recently limited theory

driven research existed with regard to teachers' situation and task specific motivation focusing on the promotion of educational innovations. Guided from a solid theoretical foundation, the data gathered here reflect pragmatic events, since all participants responded on meaningful tasks corresponding in real life situations and personal experiences. No experimental manipulation or hypothetical scenarios utilized to prompt participants behaviors or answers. This specific quality of the present PhD project strengthens the truthfulness of the findings and its added value for the advancement of educational innovations.

Overview of the Studies

Study 1 was an exploratory in nature qualitative study where face-to-face interviews were conducted in order to examine youth football coaches' (n=15) motivation to participate in training and the implementation of instructional innovation (i.e., empowering coaching). Inductive and deductive analysis of the data revealed that coaches' responses fit well to SDT framework. These instructors were found to be primarily autonomously motivated with high levels of intrinsic motivation and identified regulation in their statements, whereas controlling motivations such as introjected and external regulations existed in a much smaller range of responses.

Following the first study, a ***Study 2-Pilot 1*** was conducted in order to establish the validity of the Greek version of Work Tasks Motivation Scale for Teachers (WTMST; Fernet, Senecal, Guay, Marsh, & Dowson, 2008), an SDT-based short instrument, which was designed to be used in the subsequent studies. Sample was pre-service PE teachers (n=52) participating in the school practicum module. Analyses replicated the fit indices and alphas of the original instrument and confirmed its factorial validity. It was also found that autonomous motivations (i.e., intrinsic, identified) were positively related to mastery goal orientation, whereas controlled motivations (i.e., introjected, external regulation) were connected to performance goal orientations supporting the convergent and divergent validity of the scale. These findings provided initial support for the psychometric properties and usefulness of the instrument. Moreover, this evidence gave some first insights about the relationships to be expected between teachers' behavioral regulations and their personal goal orientations which were examined with more rigor in ***Study 4***.

In ***Study 3*** through the lenses of SDT, a mixed methods design was employed and two sub-studies were conducted in order to investigate (a) high school teachers' (n=218) motivations to participate in optional in-service training promoting an educational innovation (i.e., a new course for high school *Research Project*) (qualitatively-quantitatively); and (b) the prediction of teachers' intention (n=71) to participate in future training and to implement innovation in the next year, by their autonomous or controlled motivations (quantitatively). Similarly to coaches in ***Study 1***, it was found that teachers' motivation to participate in training could be efficiently explained by the SDT continuum of behavioral regulations. Interestingly, although both autonomous and controlled motivation existed in teachers' statements (even though in different portions), SEM analyses showed that teacher intention to engage with the specific innovation (i.e., participate in training, implement/teach the new subject) in the future was predicted significantly only by autonomous motivation.

Study 4 was a quantitative study aiming to build on the findings from the previous studies, and to investigate more extensively the emerging associations among teachers' personal psychological variables (achievement goal orientations, autonomous-controlled motivations and intentions), guiding their work behavior. Therefore two sub-studies were carried out; in the first sub-study, data that were gathered from teachers (n=191) in ***Study 3*** were merged and analyzed together with data from a new sample of educators (PE teachers from *pilot schools*, n=85) in order to examine the equivalence of predictive relationships between teachers' personal achievement goals and their motivation regarding the work task of participating in training, across groups/conditions (i.e., optional vs. mandatory). In the second sub-study, the same patterns of relationships together with teacher intention towards another work task, i.e., implement/teach innovation, were examined with a sample of secondary school teachers (n=140) who have already implemented innovation (i.e., *Research Project*) in school. SEM analyses revealed that only mastery goal orientation predicted autonomous motivation, whereas only performance avoidance predicted controlled motivation to participate in training, and these patterns of relationships were invariant across groups/conditions. In addition, it was found that mastery orientation had an indirect effect on intention to implement innovation next year and this relationship was fully mediated by autonomous motivation; on the other hand, neither of performance goals nor controlled motivation had an effect on

intention, and only performance approach predicted controlled motivation to teach the innovative subject.

Finally, the significance of individuals' competence perceptions for the theoretical foundation of the present PhD together with past evidence supporting the connection of teachers' self-efficacy with mastery orientation, led to a future oriented quantitative research. Hence, ***Study 5*** adds in the frame another very important psychological variable for the adoption of any educational innovation, teachers' personal self-efficacy (Bandura, 1986, 1997). This study served primarily as a pilot for the development and validation of a new instrument measuring Physical Educators' self-efficacy towards the accomplishment of the six basic aims/standards of the new innovative PE curriculum. Construct validity and internal consistency was examined with a sample of 149 in-service PE teachers (92 from *pilot schools*, and a supplement of 57 from traditional schools), producing acceptable indices ***(Pilot 2)***. Next, differences in PE teachers' (n=92; from *pilot schools* participating in the innovation) self-efficacy across standards, and between genders and levels of education (primary-secondary) were detected. Lastly, relationships examination between teachers' goals and self-efficacy revealed that mastery oriented PE teachers' reported higher levels in their total self-efficacy to implement the six curriculum standards, whereas no connection of self-efficacy was found with teachers' performance orientations. These findings support the external validity of the new instrument and its usefulness for future research and interventions aiming to promote educational innovations in PE.

Outline of the dissertation

Most parts of this dissertation have been published in seven jointly authored[3] articles (4 full papers & 3 short papers; Table 1). Hence, a short synopsis is needed for better comprehension of this work. Chapter two contains literature reviews on the theoretical framework, which guided this research (sub-chapter A: Self-Determination; sub-chapter B: Achievement Goals Theory). Chapter three is the summary of the methods

[3] For all the articles, the first author developed the ideas, collected the data, conducted the analyses, and wrote the initial draft and revisions. Athanasios Papaioannou, supervised the conduct of the research, provided suggestions and guidance for the development of ideas, commented on the work and assisted in editing and revisions of the articles. Regarding 6th article, Nikolaos Diggelidis, commented on the work, offered suggestions and helped with the collection of the data. Regarding 2nd and 7th articles, Yannis Tzioumakis, Charalambos Krommydas and Ioannis Syrbas helped with data collection and offered suggestions. Y. Tzioumakis offered additional help with the polishing of English in the papers.

used in the project (i.e., instruments, samples, procedure) and contains a pilot study (Pilot 1: pre-service PE teachers) for the adaptation and validation of an instrument. Chapters four and five present four empirical studies (i.e., a qualitative with youth football coaches; a mixed with high school teachers; a quantitative with high school teachers & physical educators; a quantitative future oriented study with PE teachers). Chapter six is comprised of the convergence of the main findings, general discussion and conclusion. Due to the fact that all studies were guided by specific theories and in some cases by the same sample, some overlap may exist in several parts regarding introductions, theory descriptions and method sections. Each chapter contains its own reference list.

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Chapter II THEORETICAL FRAMEWORK- Literature review

2.1 Self-determination Theory (Publication 1)

The significance of teachers' self-determination for their in-service training. The case of Physical Education teachers[4]

Abstract

The scope of the present review was to scrutinize the current literature about PE teachers' motivation to participate in professional learning, through the lenses of Self-determination theory. Cumulative research evidence and scholars' suggestions show that the tenets of this theory can constitute a strong foundation for the examination of teachers' motivation to engage in professional development. It is apparent that teachers' self-determination in work is an essential component for their optimal functioning and students' performance. It seems that if teachers' innate psychological needs are met in their work, and in their continuous education context, then it is very likely that their self-determined motivation to participate in learning opportunities will be enhanced with positive outcomes for school improvement. Interestingly, teachers' participatory motivation in further training has previously received little attention. Nonetheless, research in this area definitely deserves more attention and Self-determination theory can contribute to this direction.

Keywords: Physical educators, in-service training, intrinsic motivation in work

[4] **This is an English version of the Greek paper published on-line from the scientific peer-reviewed journal of the Greek Pedagogical Institute, *Review of Educational Issues*, *issue 17,273-298*, 2012 (Παιδαγωγικό Ινστιτούτο, *Επιθεώρηση Εκπαιδευτικών Θεμάτων, τεύχος 17*, 2012) (Publication 1)**

Introduction

In an ever-changing world where scientific research is constantly expanding the limits of knowledge, education reform efforts are the means to keep up with the rapidly accumulating new data. A significant way of successfully implementing new trends in education is through teachers' professional retraining and growth. Now more than ever, it seems to be of critical value for current societies to have educators and teachers with updated knowledge and skills, in order to assist the positive and most optimal development of future citizens. This reality makes the excellence of their educators in every field (school, sports, art etc) very important for students' progress. What is more, the educators' quality and further improvement can only be enhanced by well-designed in-service training programs which focus specifically on these goals.

There is rigorous research evidence (quantitative and qualitative) indicating that teachers' quality impacts students' achievement, whereas there is a stable connection between teachers' professional development and school improvement (Darling-Hammond, 2000). However, even if the provision of training programs, for teachers and other educators, is the most appropriate, maybe the most crucial factor for their effectiveness and usefulness is the participants' motivation to fully engage in these learning experiences. The great importance of human motivation lies in the solid links of motivation with the individuals' achievement, optimal functioning and well-being (see Deci & Ryan, 2002; Elliot & Dweck, 2005). As Roberts (2001) pointed, research of motivation deals with the "*energization*", "*direction*" and "*regulation*" of peoples' achievement behavior.

According to Jesus and Lens (2005), teachers as professionals suffer a lack of work motivation. Especially physical education (PE) teachers' motivation seems to be at a lower level comparing to other professionals (Lindholm, 1997). Also, PE is generally considered a marginal subject with low status and image, impeded by several difficulties in its delivery such as, insufficient curriculum time allocation, and inadequate teaching equipment-facilities (Hardman & Marshall, 2000, 2008). This depressing situation in PE teachers' reality makes their job motivations even more intriguing to study. Until recently, researchers usually examined teachers' motivation at the "contextual level" (Vallerand, 1997) (i.e., their work domain in general, see 'Teachers' and physical educators' self-determination in work', section). Nevertheless, Fernet and his colleagues (Fernet, 2011; Fernet, Senecal, Guay, Marsh,

& Dowson, 2008) have supported that teacher work motivation varies depending on the many different tasks they have to carry out during their work-life. Based on self-determination theory (SDT; Deci & Ryan, 1985) they have demonstrated that teacher self-determined motivation is not the same in every working aspect of teachers' reality, and underscored the multidimensionality of teachers' work motivation (Fernet et al., 2008). During the elaboration of the Work Tasks Motivation Scale for Teachers, based on participant responses, these researchers have included teachers' continuous improvement and training in a broader category of teachers' tasks named "complementary tasks". Indeed, teachers' continuous education can be grouped as a complementary task, but we strongly believe that it forms a unique category in itself, because it is a highly optional task (especially in Greece) and not an obligation (in most countries) in teachers' work life, and it may have a strong impact on their professional quality and on students' performance (Darling-Hammond, 2000). Yet, highly motivated teachers in their work could be amotivated to participate in training programs for a number of reasons. Firstly, they may believe that they excel in their job and they do not need any more retraining. Secondly, time constraints in their daily lives may not permit them to participate in education provided beyond school hours. Thirdly, the provision of professional development programs may be located out of their reach or it may be limited. Thus, it would be prudent to examine teachers' participatory motivation in learning separately, or in addition to work motivation, as a situational level motivation construct (Vallerand, 1997).

Bearing in mind that teachers' continual advancement and development is imperative for schools' improvement, it seems that in current literature teachers' participatory motivation in continuous learning often has been overlooked and this places more emphasis on the significance of this kind of research. In the present review we adopt the definition of Armour and Yelling (2004a) about continuous professional development (CPD), as the learning experiences teachers have after their initial (induction) training, which is synonymous to teachers' in-service training.

Purpose

A well established theoretical framework, potentially adequate to provide insights in teachers' participatory motivation in CPD opportunities, and the quantity and quality of their motivation, is SDT (Deci & Ryan, 1985; Ryan & Deci, 2002). Hence, the purpose of this review was to examine thoroughly the available literature about

teachers', and particularly PE teachers', motivation to participate in formal learning, and to discuss about it supported by the theory of self-determination.

Self-Determination Theory (SDT)

According to SDT, the reasons for engaging in an activity determine the type of human motivation, which can take the form of intrinsic motivation, extrinsic motivation (in various forms, see below) or amotivation (Deci & Ryan, 2002). When human behavior is intrinsically motivated the person performs an activity because it is interesting and inherently enjoyable, and not for reasons of external demands or tangible rewards (Deci & Ryan, 1985). In contrast, extrinsic motivation refers to getting involved with a task for the attainment of a contingent outcome, such as material incentives, recognition, rewards, or to avoid punishment or guilt (Ryan & Deci, 2000). Amotivation concerns the absence of motivation and will to act in a specific way, that is the lack of intention to engage in an activity (Ryan & Deci, 2002). SDT posits that intrinsic motivation, the various forms of extrinsic motivation (i.e., integrated[5], identified, introjected, external regulation) and amotivation can be placed adjacently across a continuum from the highest (intrinsic) to the lowest (amotivation) level of self-determination. Furthermore, Deci and Ryan's theory classify the types of motivation in two major categories, autonomous (high self-determination: intrinsic motivation, identified regulation) versus controlled (low self-determination: introjected, external regulation) motivation. Empirical findings from thirty years of research show that the more the self-determined motivation the better the impact on individual behavior, in a variety of domains (see Ryan & Deci, 2000, 2002). According to SDT, self-determined motivation and subsequent performance and personal growth increases in the degree to which the three universal innate needs of people are met (Deci & Ryan, 1985; Ryan & Deci, 2002). These human psychological needs for competence, autonomy, and relatedness determine and direct almost every aspect of daily life (personal, social, professional). The need for

[5] Integrated regulation represents the most self-determined type of extrinsic motivation which shares qualities with intrinsic and identified regulations; when integration is present, behavior is totally assimilated with the person, individuals recognize their engagement with an activity as highly important, personally valued, and fully internalize it in the self (Ryan & Deci, 2002). Past research has suggested that there are justified difficulties in discriminating integrated regulation from identified, in peoples' responses (Vallerand et al., 1992); therefore, following other researchers in this field (e.g. Blais, Briere, Lachance, Riddle, & Vallerand, 1993; Pelletier, Séguin-Lévesque, & Legault, 2002; Roth, Assor, Kanat-Maymon, & Kaplan, 2007) integration was excluded from further examination, discussion and analysis in the subsequent studies of this thesis.

competence refers to the peoples' propensity to feel capable in their interaction with the environment and while doing an activity. The need for autonomy is the individuals' need to feel in control of their actions and that they have a choice to act volitionally in any case (Deci & Ryan, 1985). Relatedness need, refers to the people's desire to maintain optimal relationships with significant others (Deci & Ryan, 1985).

SDT and Work Motivation

In the workplace self-determined types of motivation are consistently associated with positive results (Baard, Deci, & Ryan, 2004; Blais et al., 1993; Deci et al., 2001; Gagné et al., 2010). This line of research reveal that self-determined motivations are (a) positively connected to life and job satisfaction, optimism, affective and normative commitment, self-reported health, well-being, psychological health, and (b) negatively related to turnover intentions, psychological distress and burnout (Blais et al., 1993; Richer, Blanchard, & Vallerand, 2002). Work environments promoting the employees' needs for autonomy, competence and relatedness, have been suggested that increase their intrinsic motivation and the full internalization of external motivators, leading to greater persistence, productivity, job satisfaction, positive work attitudes, organizational commitment and psychological well-being (Gagne´ & Deci, 2005). In accordance, a cross-cultural study in professional organizations has demonstrated that the working climate that supports people's autonomy leads to the satisfaction of intrinsic needs, resulting in increased commitment and involvement of employees at work, reduced stress and increased self-esteem (Deci et al., 2001).

Teachers' and Physical Educators' Self-Determination in Work

Educational research on teachers' work self-determination has yielded similar findings, underlining the importance of teachers autonomous motivation for their effectiveness and teaching quality. For example, Fernet, Guay, and Senécal (2004) showed that work self-determination was connected positively to job control and personal acomplishments and negatively to job demands, and burnout (emotional exhaustion, and depersonalization). Professors with high levels of self-detrmination and job control adapted better to job demands and dealt with burnout (Fernet et al., 2004). In a similar vein, Roth, Assor, Kanat-Maymon and Kaplan (2007) found that elementary school teachers with higher levels of self-determination had higher sense of personal accomplishment and lower levels of emotional exhaustion. Teachers'

autonomous motivation to teach was connected with students' autonomous motivation to learn and students' beliefs that their teachers were autonomy-supportive (Roth et al., 2007). Accordingly, it has been suggested that intrinsically motivated teachers are more inclined to foster students' autonomy, resulting in students' intrinsic motivation increments (Pelletier et al., 2002; Reeve, Bolt, & Cai, 1999). This evidence is in line with a recent study which found that student engagement was directly and positively predicted by teachers' both intrinsic and extrinsic motivation, but most importantly determined by intrinsic motivation (Demir, 2011). In addition a large scale study with 4242 participants demonstrated that highly self-determined pre-service teachers tend to be more confident in teaching national curriculum and more satisfied with their training (Wang & Liu, 2008).

Two studies in education utilized teachers' professional training as an intervention, to modify teachers thinking and teaching from a controlling one (teacher-centered), to an autonomy supportive style (Reeve, 1998; Reeve, Jang, Carrell, Jeon, & Barch, 2004). In the first study, the participants were 159 pre-service teachers divided in three groups according to the training they received (autonomy supportive, controlling and neutral teaching style). Teachers' self-reports revealed that teachers who were trained to be autonomy supportive, demonstrated increased and stable orientation to this kind of teaching in comparison to the other groups (Reeve, 1998). In the second study, 20 experienced teachers were systematically observed and exhibited higher levels of autonomy supportive behaviors after attending a short training program, while their students' participation increased (Reeve et al., 2004).

Schellenbach-Zell and Gräsel, (2011) indicated that the experience of basic psychological needs can explain teachers' self-determined motivation to participate in school innovations. Correspondingly, Lam, Cheng and Choy, (2010) confirmed that when the teachers perceived a greater fulfillment of their innate needs by their school, they were more self-determined to implement educational innovation and more willing to persist in the new kind of teaching in the future. Pelletier et al. (2002) demonstrated that teachers' self-determination regarding their teaching can be undermined by the increasing pressure they feel from above (i.e., administrators, curriculum) and from below (i.e., amotivated students). Collectively, all this evidence suggests that the teachers' environment and cognitions can enhance their self-determination by fulfilling their needs, which in turn may have a positive impact on their teaching.

In the same fashion, research in the field of physical education produced analogous findings. Taylor, Ntoumanis and Standage (2008) found that the satisfaction of PE teachers' innate psychological needs at work predicted positively their self-determination, which in turn predicted the use of motivational practices during their instruction (i.e., providing instrumental help and support, giving a meaningful rationale for the content of their teaching, and attempting to gain an understanding of students). Consistently, a study with Greek teachers (N=430, including PE teachers) revealed that the more their self-determined motivation the more their engagement with extracurricular tasks to develop their self-efficacy, and the higher their job satisfaction (Christodoulidis, 2004). A more recent survey with 290 PE teachers showed that teachers' intrinsic motivation in work was positively associated with their personal mastery goal orientation, self efficacy beliefs in implementing the recently presented curriculum, and job satisfaction (Gorozidis, 2009). Higher intrinsic motivation of teachers' related with higher implementation of teaching plans of the new curriculum, greater attitudes and intention to adopt it in the future (Gorozidis, 2009). Similarly, Goudas, Biddle, and Underwood (1995) found that intrinsic motivation of undergraduate PE teachers strongly predicted their intention to take a similar course in the future. Also, Carson and Chase (2009) demonstrated that PE teachers' self-determined motivation was strongly connected with their perceptions of innate needs satisfaction (i.e., autonomy, competence and relatedness); and these needs' fulfillment were fostered by participating in conferences, educational workshops, and reading professional PE journals (Carson & Chase, 2009). These findings imply that physical educators' continuous learning may have a positive impact on their self-determined motivation for teaching, while self-determined motivation may influence their participation in future educational programs.

PE Teachers' Motivation to Participate in CPD

All the findings listed above, suggest that PE teachers' domain level self-determination plays a pivotal role for their quality as professionals and has a tremendous impact on their professional lives. Accordingly, it can be argued that physical educators' autonomous motivations at work can strongly influence their intentional engagement in CPD, despite the fact that CPD is a complementary task for teachers (Fernet et al., 2008) (i.e., situational level motivation; Vallerand, 1997) and it

may differ from their work motivation (i.e., contextual level motivation; Vallerand, 1997). With the hierarchical model of motivation, Vallerand (1997) has already supported this argument claiming that higher level motivation can predict lower level motivation, which means that contextual motivation (e.g., motivation at work) can positively influence situational motivation (e.g., motivation to participate in CPD).

In PE literature little research exists examining the reasons why PE teachers decide to participate in professional development opportunities. However survey studies in other domains regarding people's motivation to participate in occupational learning, have demonstrated that adult practitioners have the propensity to be internally motivated to pursue professional knowledge in order to enhance their competencies (Dia, Smith, Cohen-Callow, & Bliss, 2005; Garst & Ried, 1999; Laszlo & Strettle, 1996), which is rather consistent with SDT propositions.

Above all, CPD enquiry provides much evidence about how the effective in-service teacher training programs look like. The characteristics of successful educational experiences for teachers are in accordance with the basic tenets of SDT and the proposal that, teachers' innate needs satisfaction regarding their training will foster their self-determination to participate in formal educational programs, producing beneficial outcomes. For instance in UK, the National foundation for educational research (2001) found that teachers' CPD was more effective when:

- teachers had some degree of autonomy to choose and direct their training
- training activities were implemented with the appropriate expertise
- the content of the programs was challenging, current and updated, and linked to daily teaching practices (National Foundation for Educational Research, 2001)

These findings highlight the importance of autonomy and competence needs satisfaction for teachers' development.

In this line, scholars in PE literature support that teachers must have the right of choice to shape their training according to their needs, and to participate in the formulation of current reforms (O'Sullivan & Deglau, 2006). Moreover, it seems preferable for PE teachers' participation in training programs to be optional (Vasiliadou, Derri, Galanis, & Emmanouilidou, 2009) and to give them choice to participate without restricting their personal time (Armour & Yelling, 2004b). These suggestions lead to the satisfaction of the teachers' need for autonomy regarding their training. Furthermore, from research with PE teachers participating in professional

development programs, it is evident that what is very significant for Physical educators' improvement and development is their sense of competence in what they do (Deglau & O'Sullivan, 2006; Martin, McCaughtry, Kulinna, & Cothran, 2008). Their perception that they can be efficient, that they possess all the necessary competencies for the successful implementation of every proposed innovation. According to Social-cognitive theory (Bandura, 1997), teachers' self-efficacy can be enhanced through vicarious experiences, by watching innovative teaching models (Deglau & O'Sullivan, 2006), by their prior mastery experiences (Kulinna, McCaughtry, Martin, Cothran, & Faust, 2008) and by the verbal persuasion in the form of feedback, encouragement and guidance (Martin, McCaughtry, & Kulinna, 2008; Martin, McCaughtry, Kulinna, & Cothran, 2009). The promotion of educators' self-efficacy can contribute significantly to their intrinsic motivation enhancement (Deci & Ryan, 1985; Ryan & Deci, 2000).

In addition, contemporary research in education favors the training undertaken in collaborative professional learning environment (Hargreaves, 2001). Based on this principle teachers can discuss with each other the issues of their students in order to exchange views and to learn from one another. In literature this kind of educational collaborations appear as professional communities of learning (Cochran-Smith & Lytle, 1999), teacher networks (Lieberman & Miller, 1999), discourse communities (Putnam & Borko, 2000), or even communities of practice (Deglau & O'Sullivan, 2006), and they are founded on Vygotsky's (1978) constructivist theories of learning. Again this trend is revealing of how crucial relatedness need fulfillment is for teachers' development and learning. Accordingly, in recent studies it has been revealed that a very important factor for PE teachers' in-service education and change in their practices is collaboration with colleagues (Kulinna et al., 2008), mentors (Patton & Griffin, 2008), university faculty (Martin et al., 2009), administrators (Faucette & Graham, 1986), government officials (Ha, Lee, Chan, & Sum, 2004) and their participation in teachers' networks (Deglau, Ward, O'Sullivan, & Bush, 2006). If this cooperation is reciprocal and fair it is very likely to satisfy educators' innate need for relatedness and promote their self-determination (Deci & Ryan, 1985).

Discussion-Conclusion

Collectively it is plausible to assume that by enhancing PE teachers' self-determination in work (e.g., fulfilling the three basic psychological needs for

autonomy, competence and relatedness) their intrinsic motivation in teaching will be fostered, creating very positive outcomes for students' life. In this kind of professional environments it seems very probable that teachers will fully integrate the responsibility for their personal training and CPD and they will become more self-determined while pursuing their personal growth. It would be foolish to assume that all teachers want to teach, to be effective or to improve their capabilities. It could be argued though, that a great number of them do this job mechanically as a routine in order to earn their living without any internal interest, or believe that their teaching does not need any improvement. Furthermore, based on SDT and research evidence, it is not wise trying to force teachers to improve themselves and to engage in mandatory CPD, because such a strategy might have superficial results, and undermining effects on their intrinsic motivation (Ryan & Deci, 2002; Ryan & Weinstein, 2009; Sheldon & Biddle, 1998). Overall, the most appropriate policy should be to promote teachers' self-determination at work, in general and especially in their professional development context, by providing the appropriate conditions for the fulfillment of their basic psychological needs in work and training environments.

In total, the present review illustrates that teachers' motivations are vital for their optimal functioning and for students' accomplishment. Yet it is clear that PE teachers' motivation to participate in CPD, although a very significant issue, has frequently been neglected. Consequently, it appears very important to expand the knowledge on teachers' motivation to learn. This line of research merits further attention in future studies about teachers' qualities and improvement, and SDT seems to be a substantial theory to guide research and interventions for teachers' growth.

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2.2 Achievement Goals Theory

Teachers' goal orientations in work

Abstract

Recent literature review supports the notion that teachers' dispositional achievement goals, have the potential to determine important indices of their work-motivation (e.g., self-efficacy, job satisfaction, engagement, interest), and ultimately to affect their instructional practices and the way they feel and behave in every aspect of their professional life. Thus, empirical evidence together with the need for *theory triangulation* has warranted the inclusion of AGT in the present PhD research. The examination of teachers' individual dispositions (i.e., achievement goal orientations) in conjunction with their self-determined motivation seems very significant for gaining a more complete understanding of the reality about teachers' involvement with educational innovations.

Introduction

As explained in the previous section SDT can provide a solid central framework for the present PhD research. However, utilizing only one theoretical perspective may conceal the limitation of gaining insights into only one facet of the reality. On the other hand, combining multiple theoretical perspectives sets the basis for *theory triangulation* (Patton, 2002). The complementary use of AGT together with SDT has the potential to strengthen this research considerably, by providing useful information about different aspects of the phenomenon under investigation, and by supplementing and validating empirical evidence.

In brief, both theories deal with the interplay between humans and their social environment, which determines motivational qualities of personal behavior. SDT is an organismic theory which focuses on the fulfillment of peoples' innate needs (competence, autonomy, relatedness), postulating that the satisfaction of these needs (by the environment) leads to higher levels of well being and optimal functioning of individuals. In general it is assumed that both personal (e.g., dispositions) and social environmental (e.g., context, situation, task characteristics) factors determine individuals' cognition, affect and behavior. However, SDT does not focus on personal

dispositional differences (goal orientations) and does not explain how different perceptions of competence influence peoples' cognition affect and behavior, which is the focal point of AGT. Therefore, following suggestions toward synthesis (Butler, 1989; Ryan & Deci, 1989) and previous research examples (e.g., Malmberg, 2006; Ntoumanis, 2001) the complementary use of SDT and AGT was deemed appropriate to guide this work.

Purpose

The aim of this review was to investigate the contemporary literature regarding teachers' achievement goals in work. Moreover, to explore the empirical research evidence on the potential associations between achievement goal orientations and peoples' self-determined motivation to perform various tasks.

Theoretical foundation of AGT

This theoretical framework adopts an intentional perspective of behavior and assumes that humans act in a rational way trying to achieve specific goals (Nicholls, 1984). According to this theory there are two basic kinds of goals (i.e., mastery vs. performance) that people may pursue depending on their judgments of personal competence in achievement situations, which are considered to direct and guide personal behavior and to influence individual striving in various ways (Ames, 1984; Dweck & Leggett, 1988; Nicholls, 1984). These two major goals termed as (a) mastery goal (Ames, 1984), or learning goal (Dweck, 1986), or task involvement (Nicholls, 1984), and (b) performance goal (Dweck, 1986), or ability goal (Ames, 1984), or ego involvement (Nicholls, 1984). Since different names may be found in the literature for essentially the same constructs (although minor differences in their definition may exist), for reasons of parsimony, the terms used throughout this dissertation are **mastery** and **performance goals** (see Ames & Archer, 1988).

Achievement goal theorists posit that mastery goal adoption is prominent when evaluation criteria of personal competence are self-referenced. On the other hand, when criteria of success or failure are others referenced (based in norms) then a performance goal adoption is eminent (Nicholls, 1989). When individuals endorse mastery goals they are focused on personal development and the improvement of their competencies, while people who espouse performance goals are interested in demonstrating superior competencies compared to others, or to outperform others

(Ames, 1984; Ames & Archer, 1988; Dweck & Leggett, 1988; Nicholls, 1984). AGT researchers postulate that individuals have the inclination to adopt specific goals in achievement situations. These dispositional tendencies so called *goal orientations* are generally considered as somewhat stable cognitive self-schemas which are task-specific and may be changed when individuals process information about their task performance (Roberts, 2001; Roberts, Treasure, & Conroy, 2007). Importantly, achievement goal researchers suggest that mastery and performance goal orientations are orthogonal, meaning that they are independent and do not functions as opposites of the same construct (Duda & White, 1992; Nicholls, 1989; Roberts, Treasure, & Balague, 1998; Roberts, Treasure, & Kavussanu, 1996). Thus, a person can have both orientations at a higher and/or lower degree at any time (Nicholls, 1989).

Different goals reflect different conceptions of ability and effort exertion (Ames, 1992; Nicholls, 1984). Mastery oriented individuals do not differentiate effort from ability, on the contrary, they espouse the view that learning and improvement through effort implies the existence of ability, and task difficulty is judged based on their own progress. In contrast, performance oriented individuals conceive ability and effort in a differentiated sense, perceiving ability as capacity in relation to that of others, and judge the task difficulty based on the performance and effort of a normative group (Nicholls, 1984). According to research, these different goals trigger different motivational patterns of responses in cognition, affect and behavior (Dweck, 1986; Dweck & Elliott, 1983; Dweck & Leggett, 1988). For example, mastery goals have been connected with positive outcomes, such as increased motivation and persistence in the face of failure, preference for moderately challenging tasks, effective use of educational material and learning strategies, increased pleasure derived from the activity, whereas performance goals have been related to negative outcomes, such as decreased motivation and giving up in the case of failure, preference for simple or difficult tasks, superficial approach of educational material, ineffective learning strategy use and low levels of enjoyment from the activity (Ames, 1992; Ames & Archer, 1988; Dweck & Leggett, 1988; Nicholls, 1989; Nolen, 1988). These motivational qualities seem very important for educators' initial engagement and continuation of educational innovations.

In general, evidence from studies in a variety of situations, contexts and samples, show that mastery goals are consistently connected with adaptive motivational processes, whereas performance goals are more complex and although

they are frequently connected with maladaptive motivational processes, there are studies and approaches supporting the opposite (for reviews see Kaplan & Maehr, 2007; Maehr & Zusho, 2009; Papaioannou, Zourbanos, Krommidas, & Ampatzoglou, 2012). This complexity of performance goals has led to the revision of the theory and the more recent bifurcation of performance goals in approach and avoidance dimensions, triggering a debate between scholars, on the potential benefits of performance approach goals (see Brophy, 2005; Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002; Kaplan & Middleton, 2002; Linnenbrink-Garcia, 2008; Midgley, Kaplan, & Middleton, 2001; Senko, Hulleman, & Harackiewicz, 2011). In this recent conceptualization of personal achievement goals, it has been suggested that while performance avoidance goals indeed guide individual strivings in maladaptive responses, performance approach goals have the potential to orient people to adaptive responses as graded performance or intrinsic motivation (Elliot & Church, 1997; Elliot & Harackiewicz, 1996).

AGT models for research and recent conceptualizations

Within the framework of AGT (or Goal Orientations Theory for others) several important research models and approaches have been proposed, examining from two up to six (Elliot, Murayama, & Pekrun, 2011) or more goals that people may adopt in achievement situations. For reasons of conciseness we refer only to the three most prevalent models in the literature. The seminal ***dichotomous*** model, where individuals pursue either mastery goals (i.e., aiming at their personal development and learning, holding self-referenced criteria of success) or performance goals (i.e., striving to exhibit their superior ability, evaluating their success by comparing to others) (e.g., Nicholls, 1989). The ***trichotomous*** *model* where a mastery goal remains, while performance goal gets divided in approach (i.e., to outperform others) and avoidance (i.e., to avoid exhibiting low competence compared to others) (Elliot & Church, 1997). The most recent of the three approaches described here, the ***2x2*** model, where in addition to performance goals, mastery goal is also split in approach (i.e., developing mastery in a task) and avoidance (i.e., avoiding a task for not losing acquired abilities and skills)(Elliot & McGregor, 2001). In the present PhD research, we did not choose the 2x2 approach because mastery-avoidance goal is an ambiguous and comparatively new construct which is not universally accepted (Ciani & Sheldon, 2010; Maehr & Zusho, 2009).

Also, apart from the aforementioned goals, there are some other significant goals that have been suggested and are relevant to our research, such as social approval goals (Maehr & Nicholls, 1980) or work avoidance goals (Butler, 2007; Nicholls, Patashnick, & Nolen, 1985). While we acknowledge the importance of social approval goal, and we have examined it in a previous study (Gorozidis & Papaioannou, 2011), here we did not focus on this goal because we wanted to keep the length of the questionnaires and the complexity of the models to be tested as small as possible. Work avoidance approach did not selected too for the same reason, but also because in the time of the study there was no scale readily available in Greek, following the same theoretical perspective or wording with the AGT-based Greek instrument (TAGWQ; Papaioannou & Christodoulidis, 2007), which was deemed appropriate for our study purposes. Therefore, in the present research we focused only on the three goals (trichotomous model: mastery, performance approach and performance avoidance) that have been mostly examined in the literature, and the following part of this review, is describing literature evidence and findings with regard to these three goals which constitute the trichotomous model.

AGT and work motivation

Although AGT has been originally developed in the educational domain concerning mostly student motivation, its usefulness and applicability have been already documented in a variety of settings, such as sport (see Papaioannou et al., 2012; Roberts et al., 2007) and work domains (Van Yperen & Janssen, 2002; Vandewalle, 1997, 2003).

Particularly in work settings, research acknowledge that the most adaptive goal for employees' functioning is mastery goal, which has been connected positively to their working quality (working smart and hard), intrinsic motivation, self-efficacy, goal setting, work effort, planning, feedback seeking cognitions, job satisfaction, exchange relationships with supervisors, and in-role and innovative job performance (Dysvik & Kuvaas, 2010, 2013; Janssen & Van Yperen, 2004; Sujan, Weitz, & Kumar, 1994; Van Yperen & Janssen, 2002; VandeWalle, Brown, Cron, & Slocum, 1999; VandeWalle, Cron, & Slocum, 2001; VandeWalle, Ganesan, Challagalla, & Brown, 2000). On the other hand, performance avoidance goal emerged to be the most maladaptive goal and has been connected negatively to intrinsic motivation, self-efficacy, work effort, goal setting and performance (Dysvik & Kuvaas, 2010, 2013;

VandeWalle et al., 2001) and positively to extrinsic motivation and turnover intentions (Dysvik & Kuvaas, 2010, 2013). Performance approach goal found to have positive relationship with effort, hard work, extrinsic motivation and low (positive) with intrinsic (Dysvik & Kuvaas, 2013; Sujan et al., 1994; VandeWalle et al., 2001), and null relationships with job satisfaction, quality leader-member exchange relationship, working smart, use of self-regulation tactics and job performance (Janssen & Van Yperen, 2004; Sujan et al., 1994; Van Yperen & Janssen, 2002; VandeWalle et al., 1999; VandeWalle et al., 2001).

Teachers Achievement goals in Work

With regard to in-service teachers' personal goals, research is limited compared to students and athletes; however, in recent years this line of inquiry is rapidly expanding, providing important evidence contributing to the explanation of teachers' individual functioning in work. To our concern, although research on teachers' motivation and their goal orientations is not new (Ames & Ames, 1984), the most relevant papers have been published after the year 2007, and the greatest number of them after the starting point of the present PhD research at 2010 (Table 1 for a summary).

Findings from studies across different cultures, teacher level and specialization are generally congruent with the broad AGT framework. Expectedly, all studies that examined teachers' personal goal orientations found that mastery goal adoption present adaptive patterns of relationships with their cognition, affect and behavior. On the other hand, performance avoidance goal adoption has consistently exhibited maladaptive patterns of associations. However, in line with research in other domains, findings about performance approach goals are inconclusive with regard to their potential utility for teachers work related cognitions, affect and behavior.

Specifically, one of the first studies focusing on teachers' personal achievement goals in work was conducted in Greece by Papaioannou and Christodoulidis (2007). They surveyed 430 elementary and secondary teachers and found that only mastery orientation was associated positively to job satisfaction, whereas performance avoidance was negatively related and performance approach unrelated to teachers' job satisfaction. At the same time another relevant study was published, which was carried out by Butler (2007) with 212 Israeli teachers, which reported that teacher mastery goal orientation has a positive influence on help seeking

behaviors, whereas performance avoidance emerged as a negative predictor of help related attitudes and behaviors; performance approach had null relationships with these variables. This novel approach, which was suggested by these two studies, advanced the field of teacher motivation and was followed by a greater production of systematic research focusing on teacher personal achievement goals for teaching (e.g., Kucsera, Roberts, Walls, Walker, & Svinicki, 2011; Mansfield, Wosnitza, & Beltman, 2012).

For instance, Runhaar, Sanders, Yang (2010) in a study with 456 Dutch teachers, noted that mastery goal orientation related positively with reflection and feedback asking and sharing between teachers, their self-efficacy and transformational leadership. Similarly, Retelsdorf et al., (2010) found that teachers' mastery orientation was a positive predictor of mastery oriented instruction, cognitive stimulation and autonomy, high interest for teaching and low burnout, on the contrary performance avoidance predicted high burnout and low use of mastery instructional practices, and performance approach predicted the use of performance oriented practices. They also reported that while their findings regarding teacher mastery goal orientation were consistent across two samples of elementary and secondary school teachers (German=281 & Israeli=69), results about performance goal orientations were less stable (Retelsdorf et al., 2010). Accordingly, Butler and Shibaz (2014) in two studies with Israeli teachers (n=341 & n=51), found that mastery goal orientation predicted their self-reported use of cognitively stimulating instruction, while performance goal orientations had no effect. These findings were also confirmed by students who reported higher teacher support (for question asking and help seeking), lower teacher inhibition, more interest, cognitively stimulating instruction, and lower levels of cheating in classes of mastery oriented teachers contrary to performance avoidance oriented ones (Butler & Shibaz, 2008, 2014). Again, performance approach goal orientation was found to have null relationships with the variables examined in both studies (Butler & Shibaz, 2008, 2014).

Additionally, Retelsdorf and Günther (2011) surveyed 206 German teachers and indicated that mastery orientation is related to adaptive patterns of instructional practices and evaluation standards utilization, while performance approach and avoidance is connected to maladaptive patterns. However, another study which reported on the same sample of 206 in-service teachers (Paulick, Retelsdorf, & Möller, 2013) resulted in some inconsistent findings. Although mastery goal

orientation was connected with intrinsic aspects of motivation for choosing teacher education (i.e., educational interest, subject-specific interest, and ability beliefs), no connection with adaptive instruction was found. On the other hand, performance avoidance was significantly related to both extrinsic (i.e., utility) and intrinsic (i.e., subject-specific interest) aspects of teacher motivation but only with maladaptive instructional practices (i.e., surface learning and discipline). Interestingly, performance approach orientation related positively with intrinsic aspects of motivation (i.e., educational interest, subject-specific interest, ability beliefs) and both with adaptive (i.e., comprehensive learning) and less adaptive (i.e., discipline) instructional practices.

More congruent evidence with the broad AGT framework is reported by Nitsche, Dickhäuser, Fasching, & Dresel (2011, 2013) who conducted an online survey with 224 elementary and secondary teachers in Germany. They found that mastery orientation predicted positively teacher self-efficacy, perceived benefits of help-seeking, positive attitude toward further training, number of attended training workshops and negatively perceived occupational strain, while the results about performance avoidance were in the opposite direction. Performance approach was found to relate positively to perceived occupational strain and self-efficacy (Nitsche, Dickhäuser, Fasching, & Dresel, 2011, 2013). Although, this positive connection of performance approach goal orientation with teachers' self-efficacy was also reported by Gorozidis and Papaioannou (2011), and by Cho and Shim (2013), other researchers reported negative relationships of performance approach with self-efficacy (Hoffmann, Huff, Patterson, & Nietfeld, 2009). Moreover, in their study with 290 Greek PE teachers, Gorozidis and Papaioannou (2011) demonstrated that mastery orientation had the most adaptive associations with self-efficacy, and that teachers were more likely to adopt and implement the newly introduced innovative PE curriculum. Similarly, Hoffmann, Huff, Patterson, & Nietfeld, (2009) in a study with 86 elementary teachers in the US found that self-efficacy was positively related to mastery goal orientation while performance approach orientation apart from the negative relation with self-efficacy, was also positively connected with the use of tangible rewards and higher degree of control.

With regard to school goal structures, it has been reported that teacher mastery orientation may connect positively with school mastery goal structure (Cho & Shim, 2013) and negatively with school performance goal structures

Table 1. Studies investigating in-service teachers' achievement goals in work

Reference & Participants	*Research design/analysis*	*Achievement goals relationships with other psychological variables and educational outcomes*
1. Papaioannou & Christodoulidis (2007), *EP*; Greece, N=430 (elementary & secondary schools)	Survey (Correlations)	**Mastery** ↔ Job Satisfaction **Perf. Avoidance** ↔ negative Job satisfaction **Perf. Approach null** relationships
2. Butler (2007), *JEP*; Israel, N=212 (teachers),	Survey (SEM)	**Mastery**→ perceptions of help seeking, preferences for receiving autonomous help, and frequency of help seeking. **Perf. Avoidance** → negative perceptions and help avoidance. **Perf. Approach null** relationships
3. Butler & Shibaz (2008), ***L&I*; Israel,** N=53 & 1287 students (middle & secondary schools)	Teachers Survey ↔ Students Survey (Correlations, HLM)	**Mastery** ↔→ Teacher support (for question asking and help seeking) & Help seeking, negative Teacher inhibition **Perf. Avoidance** ↔ → negative Teacher support, positive inhibition & Cheating. **Perf. Approach null** relationships **(Student reported)**
4. Hoffmann et al., (2009), *TATE*; US, N=86 (elementary schools)	Survey, questionnaire & open ended items	**Mastery** ↔ self-efficacy **Perf. Approach**↔ use of tangible rewards, performance goal structure at the school level, high ratings of teacher classroom control, negative self-efficacy
5. Retelsdorf et al., (2010), *L&I*; Germany-Israel, N=281 (elementary & secondary schools), N=69 (secondary schools)	Study 1 - survey Study 2- Longitudinal (SEM)	**Mastery** ↔→Mastery-oriented practices , Cognitive Stimulation and Autonomy, Interest (both studies), negative Burnout (study 1) **Perf. Avoidance** ↔ → Burnout, negative Mastery -oriented practices; ↔ → Performance-oriented practices in study 2 **Perf. Approach**↔→ Performance practices; **null** in Study 2
6. Gorozidis & Papaioannou (2011), *EPER*; Greece N=290 (PE teachers)	Survey (SEM)	**Mastery** ↔ → Self-efficacy, intention, past behavior (curriculum implementation). **Perf. Avoidance null** relationships. **Perf. Approach** ↔ → Self-efficacy, past behavior
7. Retelsdorf & Günther (2011), *TATE*; Germany, N=206	Survey(Correlation, SEM)	**Mastery** ↔ → Individual reference norm utilization, negative Social reference norm. **Perf.Avoidance** & **Perf.Approach** ↔→ Social reference norm use
8. Runhaar et al.,(2010), *TATE*; Netherlands, N=456 (secondary vocational school)	Survey (Correlation, Regression)	**Mastery** ↔ → Reflection, Feedback asking, ↔ Self-efficacy, Transformational Leadership
9. Nitsche et al., (2011), *L&I*; Germany N=247 (teacher trainees) N=224 (elementary & secondary school)	Online Survey (Invariance, SEM)	**Mastery** ↔ → Self-efficacy, Perceived benefits of help-seeking **Perf. Avoidance** ↔→Perceived threats of help-seeking, negative Self-efficacy **Perf. Approach** ↔ →Self-efficacy

10. Parker et al., (2012), *TATE*; Australia N=430 (elementary & secondary school)	Longitudinal two-wave (SEM)	**Mastery** ↔ engagement, negative burnout, → use of adaptive coping strategies towards work threats and/or challenges (problem-focused coping, negative emotion-focused coping). **Perf. Avoidance** ↔ negative engagement, burnout, → use of maladaptive coping strategies towards work threats and/or challenges (emotion-focused coping, negative problem-focused coping)
11. Nitsche et al., (2013), *L&ID;* Germany N=224 (elementary & secondary school),	Online Survey (Correlation, Regression)	**Mastery** ↔ → Attitude toward further training, Number of attended training workshops, negative Perceived occupational strain **Perf. Avoidance** ↔→ Perceived occupational strain, negative Attitude toward further training. **Perf. Approach** ↔ Perceived occupational strain
12. Paulick et al., (2013), *IJER;* Germany N=206 (Study 2)	Study 2 survey (Correlation, SEM)	**Mastery** ↔ Intrinsic aspects of motivation for choosing teacher education (i.e., Educational interest, Subject-specific interest, Ability beliefs) **Perf. Avoidance** ↔ Subject-specific interest, Extrinsic aspects of motivation (i.e., Utility), maladaptive instructional practices (i.e., Surface learning, Discipline). **Perf. Approach** ↔ Intrinsic aspects of motivation (i.e., Educational interest, Subject-specific interest, Ability beliefs), adaptive (i.e., Comprehensive learning) & less adaptive (i.e., Discipline) practices
13. Cho & Shim, (2013), *TATE*; US N=211 (elementary & secondary school)	Online Survey (Correlation, Regression)	**Mastery** ↔ School mastery goal structure, self-efficacy (←) **Perf. Avoidance null** relationships **Perf. Approach** ↔ School performance goal structure, self-efficacy (←)
14. Dresel et al., (2013), *P*; Germany N=46 (Mathematics teachers) & 930 students,	Survey, Two-level modeling (HLM)	**Mastery** → negative performance goal structures (approach and avoidance) **Perf. Avoidance** → performance goal structures (approach and avoidance) **Perf. Approach** → mastery goal structure
15. Skaalvik & Skaalvik, (2013), *IJER;* Norway N=2569 (elementary & secondary schools),	Survey (SEM)	**Mastery** ↔ Engagement, Job Satisfaction, → work-related Motivation (i.e., Engagement, Job Satisfaction) **Perf. Avoidance** ↔ negative Engagement, Job Satisfaction, → negative work-related motivation. **Perf. Approach**↔ Engagement → work-related motivation
16. Butler & Shibaz, (2014), *IJER;* Israel N=341 (secondary schools) N=51 and 1280 students	survey Study 1 - 2 Longitudinal (HLM, MLM, Correlations)	**Mastery** ↔ →Cognitively stimulating instruction; ↔ Cognitively stimulating instruction and interest **(Student reported)** **Perf. Avoidance & Approach null** relationships
Note: ↔ = correlation; → = prediction; ***Journals:*** *Teaching and Teacher Education (TATE; 5), Learning and Instruction (L&I; 3), International Journal of Educational Research (IJER; 3), Journal of Educational Psychology (JEP), Learning and Individual Differences (L&ID), Psychology (P), Educational Psychology (EP), European Physical Education Review (EPER).*		

(Dresel, Fasching, Steuer, Nitsche, & Dickhäuser, 2013); performance avoidance is reported to connect positively only to performance goal structures (Dresel et al., 2013), whereas performance approach orientation may connect positively with performance goal structures (Cho & Shim, 2013; Hoffmann et al., 2009) and in some cases with mastery goal structure (Dresel et al., 2013).

Also, in a study with 430 Australian teachers, mastery versus performance avoidance orientation, was connected to higher work engagement and lower burnout and predicted the use of adaptive coping strategies (i.e., high problem-focused coping, low emotion-focused coping) towards work threats and/or challenges (Parker et al., 2012). Similarly, in a large scale study in Norway with 2569 teachers from elementary and secondary schools, Skaalvik and Skaalvik (2013) reported that contrary to performance avoidance goal orientation, mastery was connected to higher engagement and job satisfaction and predicted positively this work-related motivation; in this study, although performance approach goal predicted work-related motivation, it was weakly related to work engagement and unrelated to job satisfaction.

To sum up, all these findings confirm that mastery is the most adaptive and performance avoidance the most maladaptive goal orientation for teachers' cognition, affect and behavior. However, the evidence about performance approach goal orientation seems to be ambiguous and sometimes findings contradict each other. The finding that performance approach goal orientation has the potential to connect with adaptive outcomes is in line with literature evidence in other domains (e.g., Harackiewicz et al., 2002; Van Yperen, 2006; VandeWalle et al., 2001).

AGT – SDT empirical links

AGT and SDT theoretical and empirical evidence suggest that since mastery oriented individuals engage in activities aiming to improve personal competence and their mastery development is a an end in itself, they would present higher levels of intrinsic motivation and more self-determined types of motivation. On the other hand, performance oriented people engage in activities as a means to an end, aiming to gain positive or to avoid negative evaluations of their competence in relation to others; thus, they would present higher levels of extrinsic motivation and less self-determination.

The examination of relationships between goal orientations and intrinsic motivation has a long history of research in various situations and contexts (for a

review see Rawsthorne & Elliot, 1999). However, in order to get a more complete insight on how dispositional achievement goals affect self-determined motivation, the associations of goal orientations with all the types of motivational regulations (i.e., the whole self-determination continuum) or autonomous versus controlled motivation, need to be examined more thoroughly.

Currently, there are several cross sectional studies following Nichols' (1989) theorizing, which have examined the relationships between task and ego orientation (mastery vs. performance for others) with self-determined motivations (behavioral regulations: intrinsic motivation, identified, introjected, external regulation and amotivation) (e.g., Brunel, 1999; Ntoumanis, 2001; Standage & Treasure, 2002). For example, in a study with 160 university PE students in France, Brunel (1999) found that the higher their task orientation the higher the level of their self-determination to participate in a badminton course (positive relationship with all three dimensions of intrinsic motivation, negative with amotivation), whereas the higher the ego orientation the lower the level of their self-determination (positive associations with introjected and external regulation). In a similar fashion, Standage & Treasure (2002) surveyed 318 middle school students in US and reported that task orientation was positively related to more self-determined (intrinsic, identified and negative to external and amotivation) types of situational motivation, whereas ego orientation was only weakly associated to external regulation and amotivation for participating in PE classes. In addition, Ntoumanis (2001) surveyed 247 British university athletes to examine their motivation to participate in their sport; he found that task orientation predicted intrinsic motivation (all three dimensions) and identified regulation whereas ego orientation predicted introjected and external regulation, and interestingly intrinsic motivation to experience stimulation. More recently, Barkoukis, Ntoumanis, & Nikitaras (2007) conducted a study in Greece with 336 adolescents, participants of a summer sports camp; they reported that task orientation predicted intrinsic motivation and identified regulation, and negatively external regulation and amotivation, whereas ego orientation predicted positively all the extrinsic types of regulation (identified, introjected, external).

Considering that mastery orientation is the equivalent of task orientation, and performance approach and avoidance are both contents of ego orientation, findings from studies following Elliot's (1997) trichotomous conceptualization, even though they are consistent in most parts (mastery & performance avoidance orientation),

present some differences in other parts (performance approach orientation), minor in my opinion. For instance, in two experimental studies with undergraduate students (n=84 & n=92), Elliot and Harackiewicz (1996) found that only performance avoidance goal undermined intrinsic motivation, while performance approach and mastery goal conditions produced the same levels of participants' intrinsic motivation to solve hidden word puzzles. Similarly, in a longitudinal study with 178 undergraduates from a US university, Elliot and Church (1997) indicated that mastery goals enhanced intrinsic motivation; performance approach had no impact, and performance avoidance diminished students' intrinsic motivation to participate in a psychology course. In accordance, in one of their studies (study 2) with 148 undergraduate participants of a psychology class, Elliot and McGregor (2001) reported that students' self-determination was positively related to mastery goals, unrelated to performance approach and negatively related to performance avoidance goals. More recently Bell and Kozlowski (2008) examined university student trainees' (n=350) underlying processes of active learning and indicated that intrinsic motivation had a positive relationship with mastery orientation (both state and trait), low positive or insignificant correlation with performance orientation (state - trait respectively), and low negative associations with performance avoidance orientation (both state and trait); however as a part of a complex predictive model, with regard to AGT factors, only trait mastery predicted state mastery orientation which in turn predicted intrinsic motivation.

European based studies presented similar findings regarding the links of tripartite achievement goals and self-determined motivation. Specifically, in a cross sectional study with 475 university students in UK, Smith, Duda, Allen, & Hall (2002) reported positive associations of mastery goals with higher self-determination towards educational activities (i.e., intrinsic motivation, identified and introjected regulation but no relation to external regulations). On the other hand they found positive relations of performance approach goals only with intrinsic motivation to accomplish but also with all three types of extrinsic motivation (identified, introjected, external regulations), the strength of which relationships increased with less self-determined regulations. Finally, performance avoidance goals were significantly associated with lower levels of self-determined motivation and amotivation. Also, Nien & Duda (2008) sampled 450 athletes in UK and found that mastery approach goal predicted intrinsic motivation, whereas, performance approach predicted

extrinsic motivation for sport participation. Performance avoidance predicted only athletes' amotivation. Furthermore, in an interesting research examining the dominant achievement goals of individuals, Van Yperen (2006) reported on two studies with university students in the Netherlands (n=333 & n=279); he found that students with dominant mastery approach goal were scored high in intrinsic motivation and interest, individuals with a dominant performance approach goal were relatively high in both intrinsic and extrinsic motivation and also amotivation, whereas when performance avoidance goal was dominant students indicated high levels of extrinsic motivation and amotivation, and low levels of interest.

In the Greek context, Barkoukis et al. (2007) indicated that mastery goals predicted positively intrinsic and identified regulations and negatively external and amotivation; performance approach significantly related to identified, and external regulation and predicted introjected regulation, while performance avoidance goals predicted identified, introjected and external regulations. Additionally, in a study with 580 students, Papaioannou, Simou, Kosmidou, Milosis, & Tsigilis, (2009) found that mastery goal associated positively with the highest levels of self-determination (intrinsic, integrated and identified regulation), and negatively to amotivation. In this study, performance approach and avoidance goals presented equivalent associations with self-determined motivations; they connected positively with introjected regulation and amotivation, but also had a low positive correlation with integrated regulation.

All these findings reveal that mastery goal orientation present the most adaptive patterns of relationships and performance avoidance the most maladaptive patterns of relationships with behavioral regulations. However, evidence on performance approach goals are mixed since they may present adaptive, neutral and in some cases maladaptive patterns of associations with self-determined motivations.

Discussion-Conclusion

Although the existing literature acknowledges the utility and significance of this line of research, establishing the patterns and meaning of relations between individual dispositions (i.e., goal orientations) and self-determined motivation (i.e., behavioral regulations), the examination of these links in the field of teacher motivation have generally been neglected. In the international literature we have located only two relevant studies which were conducted in Finland, one with student teachers (n=170)

(Malmberg, 2008), and one with applicant (n=230) and student teachers (n=114) (Malmberg, 2006), but none with in-service teachers. In the first of these studies, Malmberg (2006) reported positive links between mastery goals and intrinsic motivation, while performance approach was found to have null or positive relationships with extrinsic motivation, and performance avoidance goal related positively to extrinsic motivation. In the second study which was a longitudinal one, Malmberg (2008) indicated that only mastery goal orientation predicted student teachers' intrinsic motivation in teaching. In the Greek literature, we are only aware of a study by Christodoulidis, (2004) which was conducted with in-service teachers (n=430) and examined the abovementioned relationships on the contextual (i.e., work in general) or the global level (i.e., life) of generality, but not on the situational level (i.e., innovative instruction, training participation). He reported that mastery goals (in work and life) were positively linked with intrinsic, identified and introjected regulations for teaching, performance avoidance goals were related to introjected and external regulations, and performance approach goals presented generally non-significant relationships with regulations (only performance approach in work was positively associated with introjected regulation). These findings are quite similar to those already reported from different samples.

AGT scholars define goal orientations as somewhat stable cognitive schemas that may be affected by contextual, situational or task characteristics (e.g., Button, Mathieu, & Zajac, 1996; Kaplan & Maehr, 2007). Having this in mind, current literature evidence focusing on in-service teachers' goal orientations and their connections with optimal (i.e., self-determined) motivation towards specific work tasks is limited. Especially when these work tasks pertain to educational innovations, research on teacher motivation form an AGT or/and SDT perspective is far from ideal. Thus, following Vallerand's (1997) argument that it is pointless to examine motivation in general, in the present PhD research we focused on the situational level of generality, the motivation of "here and now"(Vallerand, 1997), that teachers experience while engaging in work tasks relevant to educational innovations (i.e., participation in training and implementation of innovative instruction). Therefore, in the next chapters, three studies are provided on situation and task specific motivation of teachers, PE teachers and student teachers, and the potential relationships of their goal orientations with self-determined motivation in the Greek educational context/system which aim at promoting instructional innovations.

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Chapter III MIXED METHODS

3.1 Research Design

From the six major mixed methods designs outlined by Creswell and Plano Clark (2011, pp. 69-72), the approach employed in the present research was a complex *multiphase design*, which consisted of seven distinct phases (see Figure 1). The sequence and implementation of the studies was not predetermined but emerged while the different educational innovations were implemented (Creswell, Klassen, Plano Clark, & Smith, 2011) (p. 7). A multiphase design variant may join together sequential and concurrent qualitative and quantitative components and multiple types and sources of data (Creswell & Plano Clark, 2011, p. 103). The rationale for choosing this approach was to triangulate and to complement responses from multiple samples and situations, in order to better understand the phenomenon of interest and to be able cautiously to generalize findings. In this multiphase research project, one study builds on the findings of another (see Figure 2) and contributes to the overall interpretation of the problem providing answers for the overarching research questions (Creswell et al., 2011).

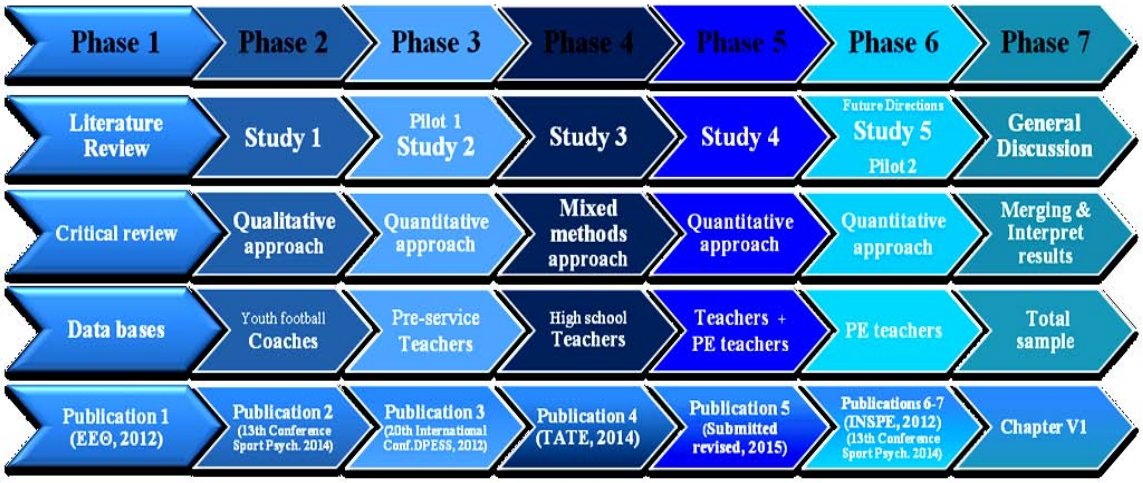

Figure 1: Visual representation of PhD research Multiphase mixed methods design

3.2 Samples & Procedure

The present research was conducted in Greek context with purposefully selected samples that experienced the phenomenon under investigation. Prior to this PhD research, the approval by author's University Ethics Committee was obtained, and participants invited to take part voluntarily, while their anonymity and confidentiality

were warranted (reassured). Selection criteria for educators' inclusion in the study were (a) to be in-service, (b) to participate in a training program aiming to promote educational innovation, and (c) to implement innovative instruction in practice. Under these criteria three different samples which were trained in three independent occasions were invited to participate in the research. Points of reference for the main studies were, (a) two training programs which were delivered by the Ministry of Education to in-service teachers, the first regarding the implementation of a new subject (i.e., *Research Project*) for high school, and the second regarding the implementation of a new PE curriculum for primary and junior high school (i.e., *New School*); and (b) one training program provided to youth football coaches (innovative instruction namely *Empowering Coaching*) by University of Thessaly's specialists during a research project namely *PAPA* (*Promoting Adolescents Physical Activity*). Additionally, for the pilot study presented below, the sample selected with the same criteria and consisted of pre-service PE teachers (senior students) participating in the practicum module. This module was aiming to promote innovative PE teaching in primary and secondary school and required undergraduate students to implement innovative teaching practices at schools.

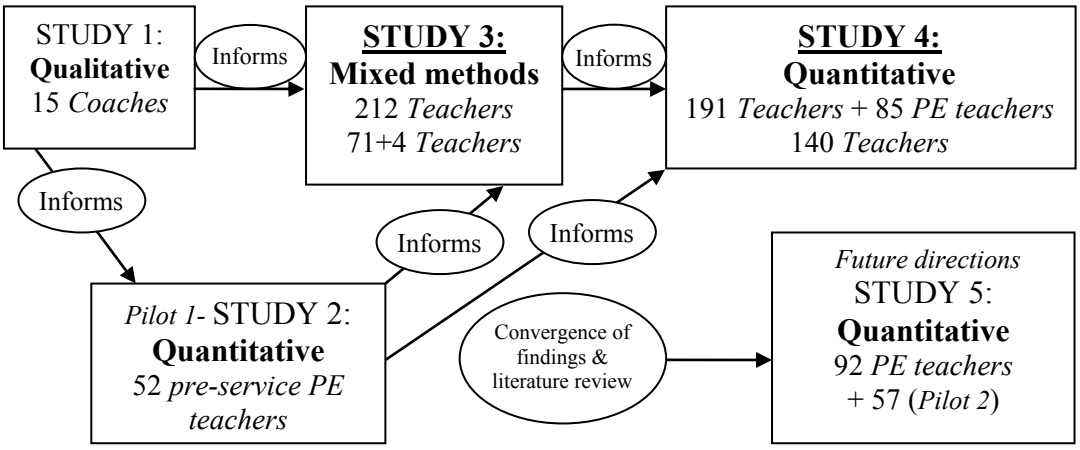

Figure 2: Schematic representation of the empirical studies and their connections

Data from independent samples collected and analyzed separately producing distinct publications; only in the case of Study 4 (Pub. 5), data from two samples (i.e., secondary school teachers & PE teachers) were merged together for research

purposes. Thus, each study (apart from Study 4) reports on a specific sample of educators[6].

3.2.1 Sample 1: Youth football coaches (Pub. 2/ Study 1 - Chap. IV)

The sample of coaches who were participated in this study consisted of 15 in-service youth coaches from six football Academies which were located in large cities all over Greece (Athens, Thessaloniki, Patra, Larisa, Volos, Trikala). These clubs got involved with a research project that was implemented by the Department of Physical Education and Sport Science of the University of Thessaly namely *The Papa Project* (*Promoting Adolescences' Physical Activity*). These coaches participated in an innovative coach education program focusing on the creation of an empowering climate in their teams and promote young athletes' quality motivation and physical activity. From the 70 youth football coaches participating in the *The Papa Project*, 15 accepted our invitation to be interviewed. Their mean age was 34.8 years (SD=8.1, from 26-52 years old) with an average coaching experience of 9.2 years (SD=6.8). Twelve had been football athletes previously, and all of them held a bachelor degree in Physical Education and Sports Science with specialization to football.

3.2.2 Sample 2: Pre-service PE teachers (Pub. 3/ Study 2-Pilot1 - Chap. III)

Fifty-six undergraduate senior students, from the Department of Physical Education and Sport Science of the University of Thessaly, were invited to participate in the pilot study voluntarily by responding anonymously in a short questionnaire. Through this questionnaire the researcher wanted to examine the relationships between pre-service teachers' achievement goals and their behavioral regulations for participation in the practicum module. Hence, this sample responded to this questionnaire in order to provide data that would facilitate the establishment of the psychometric properties of this measure. Four individuals did not reply to the questionnaire. The final sample comprised of 52 pre-service PE teachers, 29 males and 23 females. Age-specific data or other demographics were not gathered. However, because during the academic semester that this study was conducted, the practicum module provided only to 4th year undergraduate students, it can be inferred that most of the participants were at minimum about 21 years old.

[6] While there is a short description of each sample in this section, a more detailed account of the samples and the procedures might be found in each independent Study respectively.

3.2.3 Sample 3: High school teachers (Pub. 4/ Study 3 & Pub. 5/Study 4 - Chap. V)

The initial pool of teachers who were invited to participate in this PhD project consist of 1010 high school teachers specialized in various academic subjects (e.g., philologists, physicists, mathematicians, foreign language, teachers of informatics). These educators were invited because they took part in the first teacher training program organized by the Ministry of Education (June 2011), about the first time introduced innovative subject *Research Project* in formal High school curriculum. Invitations together with electronic surveys were sent to the teachers via e-mail in two waves, one at the beginning (October 2011) and the second at the ending (June 2012) of the school year. The final samples of teachers who decided to participate in our studies were 218 at the beginning (138 females and 80 males with teaching experience from 2-31 years, M=14.13±7.19), and 140 (79 females and 61 males with teaching experience from 3-35 years, M=15.34±7.60) at the ending of the school year. From the available teachers' responses, in each study only the data which corresponded to the specific research questions were used respectively (see original Pub. 4 & 5).

3.2.4 Sample 4: Physical Education Teachers (Pub. 5/Study 4 - Chap. V & Pub. 6 & 7/Study 5 - Chap. VI)

The total number of in-service PE teachers who took part in the study was 149. From them 57 teachers (35 males, 22 females/ 21 primary, 36 secondary school) were working in general education, and 92 (48 males, 44 females/ 53 primary, 39 secondary school) were working in pilot schools. The total sample used only in the future directions study to examine the factorial validity of the new self-efficacy instrument which was constructed here (Pub. 7/ Pilot 2). The sample of pilot schools PE teachers was used to examine training and implementation relevant hypotheses which are described in two separate papers (see original Pub. 5 & 6). These teachers were participants of the first training program (replied 92 out of 126) held by the Ministry of Education to support the implementation of the new innovative PE curriculum (2011-2012 school year). All physical educators responded voluntarily in anonymous questionnaires.

3.3 Instruments

3.3.1 Quantitative

Work Tasks Motivation Scale for Teachers

Teachers' situational level motivation regarding their engagement with specific work tasks (i.e., training, teaching innovation) was assessed using the Greek version of the Work Task Motivation Scale for Teachers (WTMST; Fernet, Senecal, Guay, Marsh, & Dowson, 2008). This is an SDT based instrument, which was translated and adapted in Greek as part of this PhD research (see the pilot study below; Gorozidis & Papaioannou, 2012). This instrument consists of 5 subscales (intrinsic, identified, introjected, external, amotivation) with 3 items per scale, a total of 15 items. Following the stem "Why have you participated in this training program?" or "Why do you teach the new subject Research project?" participants responded to items as, "Because I like doing it" (intrinsic), "Because I consider it important for the academic success of my students" (identified), "To not feel bad if I don't do it" (introjected), "Because my position might be in danger if I don't" (external), "I don't know, I don't see any purpose in this task" (amotivation). Responses were given on a 7-point Likert type scale ranging from 1 (does not correspond at all) to 7 (corresponds completely). Study 2-Pilot 1 was conducted to investigate the psychometric properties of this measure and its findings are presented in Publication 3 below. Evidence of validity and reliability of the different versions of this instrument which was used in the studies, can be found in the relevant section of each paper (see Pub.3/Pilot 1-Study 2, Pub.4 & Pub.5).

Teachers' Achievement Goals in Work Questionnaire

Teachers' situation specific achievement goal orientations regarding the implementation of innovative instruction were assessed using a valid instrument for the Greek population, namely Teachers' Achievement Goals in Work Questionnaire (TAGWQ; Papaioannou & Christodoulidis, 2007; Gorozidis & Papaioannou, 2011). In the present research three subs-scales with four items each (in sum 12 items) were utilized, corresponding to *mastery*, *performance avoidance* and *performance approach goals*. Following the stem "When teaching innovation…" teachers replied in items as "My goal is to continuously develop my abilities as a teacher" (mastery goals), "I want to avoid teaching tasks in which I may look incapable" (performance avoidance goals) and "I am absolutely satisfied when it looks that I am better teacher

than others" (performance approach goals). Responses were indicated on 5-point Likert type scales ranging from 1 (strongly disagree) to 5 (strongly agree). Internal consistency and construct validity evidence of the scales provided in the relevant section of the corresponding publications (see Pub.2/ Pilot-Study 2 & Pub.4).

Teacher Intentions

Teacher intentions to participate in training and to implement innovation were measured by two 2-item scales which were constructed based on the Theory of Planned Behavior recommendations (Ajzen, 2002). Participants responded in 7-point semantic differential scales (likely/unlikely, yes/no) to the statements: (a)"During the next season I plan to participate in a training program about the implementation of the new subject", "During next season I am determined to participate in a training program about the implementation of the new subject", and (b)"During next season I plan to teach the new subject *Research Project*", and "During the next season I am determined to teach the new subject *Research Project*". Reliabilities provided in the relevant sections of the corresponding publications (see Pub.4 & Pub.5)

3.3.2 Qualitative

Coaches' Interview guide

For the needs of this research, a semi-structured interview guide was developed to capture coaches' motivations to participate in the innovative educational coaching program the *PAPA project*. The guide consisted questions and probes as "What were the reasons that led you to participate in the program?", "Which was the most important reason for you?", "Have you gained anything from your participation and engagement with Papa project?", "What were your expectations from this project?"

Teachers' Interview guide

Similarly to coaches' interview guide, for teachers' written interviews regarding their involvement with the educational innovation, two questions relevant to this study were used "What were the reasons that led you to participate in the training?" and "Which is the most important reason for you?"

Teachers' qualitative open-ended items

In order to get unbiased responses from teachers and to complement the quantitative data of the questionnaire, teachers were asked two open-ended questions "What were

your reasons for registering for the *Research Project* training course?", and "Which was the most important reason for you?". These questions were placed prior to the quantitative scales in the electronic survey and participants did not have the option of revising their responses after proceeding to the pages with the close-ended questions.

3.4 Data Analysis

3.4.1 Quantitative analysis

The statistical software packages utilized for the present research consisted of SPSS v.15 & v.20 and Amos v.16. Statistical analysis used to test the validity of the measurements was Confirmatory Factor Analysis (CFA), while internal consistencies were estimated with Cronbach's coefficient alphas. For the examination of theoretical hypotheses (e.g., patterns of relationships between latent variables, prediction, invariance testing) the basic analysis used was Structural Equation Modeling (SEM). In addition, scales descriptives and correlations were computed. Detailed description of analyses may be found in the specific section of each study.

To evaluate goodness of fit in each model we emphasized the Tucker-Lewis Index (TLI; Tucker & Lewis, 1973) and Comparative Fit Index (CFI: Bentler, 1990), the Root Mean Square Error of Approximation (RMSEA; Steiger & Lind, 1980), and the chi-square (χ^2) to degrees of freedom (df) ratio or normed χ^2 (χ^2/df; Wheaton, Muthen, Alwin, & Summers, 1977). The TLI and CFI may vary from 0 to 1, and values greater than .90 considered acceptable (Hu & Bentler, 1999). For RMSEA values below .05 indicate close fit and up to .08 indicate a fair fit, whereas values from .08 to .10 considered mediocre and above .10 considered poor (MacCallum, Browne, and Sugawara, 1996). For normed chi-square (χ^2/df) values up to 2 or even as high as 3 considered acceptable (Kline, 2005; Tabachnick, & Fidell, 2007)

3.4.2 Qualitative analysis

Management and analyses of qualitative data (face-to-face interviews, written interviews and open-ended questions) assisted by the computer software QSR Nvivo v.8. As soon as the data were collected there was a subsequent analysis of them and continual reflection (Rossman & Rallis, 1998). A peer debriefer (doctoral supervisor) supported the process in order to enhance credibility (Creswell, 2003, p. 196). Following Creswell (2003), analytic procedure conducted in three steps: (1) organizing and preparing the data, (2) reading through data to gain a "general sense"

and to reflect, (3) beginning thorough analysis using a coding process (Creswell, 2003, p. 191). For the thematic analysis of the raw data and the coding process, a theory-driven approach was chosen, where analysis begun deductively and concluded inductively. Guided by Boyatzis' (1998, p. 35) recommendations for the development of themes and codes deriving from a theory, three steps were carried out including (a) generating codes, (b) reviewing and rewriting the themes and codes, and (c) determining the reliability of codes and coders (Boyatzis, 1998). The reason to this kind of analysis was to see if our data fit well to the theoretical framework of Self-determination (Deci & Ryan, 1985, 2000). To establish credibility and the accuracy of our analyses a second external trained coder, different from the *peer debriefer* (Creswell, 2003), served to review data and to compare findings until consensus was met (*Analyst triangulation*) (Patton, 1990).

3.5 Summary of methods & original publications

Table 2. Overview of the Multiphase mixed methods research design

Phase	*Study*	*Approach*	*Sample*	*Publication*
1st ↓	**Literature Review**	**Qualitative Critical review**	International and Greek data bases/ publications	*Review of Educational Issues,* 2011, in Greek (Gorozidis & Papaioannou, 2011)
2nd ↓	**Study 1** Exploratory → SDT confirmation *(Deductive-Inductive)*	**Qualitative** Interviews	Youth football **Coaches n= 15**	*13th Conference of Sport Psychology,* 2014 (Gorozidis, Tzioumakis, Papaioannou, & Krommydas, 2014)
3rd ↓	**Pilot1-Study 2** WTMST-GR scale validation *(CFA & SDT↔AGT correlations)*	**Quantitative** Questionnaires	**PE pre-service** (student) **teachers n= 52**	*20th International Conference* DPESS, 2012 (Gorozidis & Papaioannou, 2012)
4th ↓	**Study 3** 1) SDT confirmation *(Deductive-Inductive)* 2) SDT→INT *(SEM)*	**Qualitative & Quantitative Concurrent** On line survey open-ended items, email interviews & questionnaires	Secondary school **Teachers** **1) n= 218/ 4** **2) n= 71**	*Teaching & Teacher education*, 2014 (Gorozidis & Papaioannou, 2014)
5th ↓	**Study 4** 1) AGT→SDT (*SEM, Multi-group invariance)* 2) AGT→SDT→INT *(SEM-Bootstrap)*	**Quantitative** Questionnaires	Secondary school **Teachers + PE teachers** **1) n= 192 + 85** **2) n= 140**	*Submitted for publication* (Gorozidis & Papaioannou, 2015, submitted)
6th ↓	**Study 5-Pilot2** **Future Directions** 1) SET scale validation *(CFA)* 2) SET differences *(RM-ANOVA & MANOVA)*	**Quantitative** Questionnaires	**PE teachers** **1) n= 149** **2) n= 92**	*13th Conference of Sport Psychology,* 2014 (Gorozidis, Papaioannou, Diggelidis, & Syrbas, 2014) *Inquires in Sport & Physical Education*, 2012, in Greek. (Gorozidis, Papaioannou, & Diggelidis, 2012)
7th	**Merging results**	Interpretative	Total sample	Chapter VI

Note: The symbol (↓) represents that each phase in some way informs the next one; SDT refers to Self-Determination Theory variables; AGT refers to Achievement Goals Theory variables; INT refers to behavioral intentions; SET refers to Self-Efficacy Theory variables; CFA: Confirmatory Factor Analysis; SEM: Structural Equation Modeling.

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3.6 Study 2-Pilot 1 (Quantitative/Publication 3)

Initial Validation of the "Work Tasks Motivation Scale for Teachers"- Greek V.[7]

Abstract

Teachers' motivation regarding the many different tasks they have to carry out is essential for the quality of teaching and their working behavior. In Greek context there is a lack of valid and reliable instruments measuring teachers' self-determined situational motivation. Thus, the purpose of this study was to evaluate the factorial validity and internal consistency for the Greek version of the Work Tasks Motivation Scale for Teachers (WTMST; Fernet, Senecal, Guay, Marsh, & Dowson, 2008). The translation (back to back translation) and adaptation of the instrument for the Greek population were made by two experts in the field of teachers' motivation. This 7-point Likert type scale reflects the self-determination theory continuum of behavioral regulations, and is a short measurement of situational self-determined motivation for a teachers' task in their work. The original 15-item instrument is comprised of five subscales with 3 items per behavioral regulation (intrinsic, identified, introjected, external, amotivation). The sample of the present study were 52 (29 male, 23 female) physical education pre-service teachers (final year undergraduate students) of the Department of Physical Education and Sport Science of the University of Thessaly, participating in the school practicum module. Factor analysis was conducted with the AMOS 16 statistical package, using maximum likelihood estimation method. Confirmatory factor analysis replicated the fit indices of the original WTMST version and supported a 14 item 5-factor correlated model. The overall fit of the model was good (TLI =0.976, CFI =0.982, RMSEA=0.039, χ^2 =72.33, df =67, χ^2/df = 1.08). Internal consistency of the instrument were verified with acceptable Cronbach's a (>.70) for every subscale, while factors' correlations were all in the expected directions. The external construct validity was evaluated through the relationships (Pearson correlation) of the behavioral regulations with teachers' achievement goals orientations, measured by a valid and reliable instrument for the Greek context (TAGWQ; Papaioannou & Christodoulidis, 2007). Self-determined motivation (i.e., intrinsic, identified) correlated with mastery orientation (r >.28, p<.05), while non

[7] **Pilot 1- Study 2 was published by the Department of Physical Education and Sport Science of Democritus University (Komotini, Thrace), in the International Conference proceedings of 2012, as a short paper in the Sport Psychology section (pp. 3-7) (Publication 3).**

autonomous motivation (i.e., introjected, external) associated with performance orientations (r >.28, p<.05) supporting the convergent and discriminant validity of the scale. All these findings suggest that the Greek version of the WTMST is a valid and reliable instrument and provide initial support for its psychometric properties. This kind of measurements may be proved very useful in the examination of Greek PE teachers' motivation in important work tasks (e.g., in-service training) that affect their job quality.

Key words: *Self-determination, teaching duties, confirmatory factor analysis*

Introduction

Teachers' motivation regarding the many different tasks they have to carry out is essential for the quality of teaching and their working behavior. Rigorous research evidences suggest that self-determined types of motivation has the most positive impact on human behavior and well-being, and are strongly related with positive outcomes in various life domains (Deci & Ryan, 2002). In Greek context there is a lack of valid and reliable instruments measuring teachers' self-determined situational motivation.

The purpose of this study was to evaluate the factorial validity and internal consistency for the Greek version of the Work Tasks Motivation Scale for Teachers (WTMST; Fernet, Senecal, Guay, Marsh, & Dowson, 2008). WTMST is a short scale assessing situational work motivation for teachers, based on a well established theory of human motivation, the Self-determination theory (Deci & Ryan, 2002).

Method

Participants

The sample of the present study were 52 (29 male, 23 female) physical education (PE) pre-service teachers (final year undergraduate students) of the Department of Physical Education and Sport Science of the University of Thessaly, participating in the school practicum module.

Instruments

The Work Tasks Motivation Scale for Teachers (WTMST; Fernet, Senecal, Guay, Marsh, & Dowson, 2008), were translated and adapted in Greek, for PE pre-service teachers. The original 15-item instrument consists of five subscales (i.e. intrinsic,

identified, introjected, external, amotivation), with three items each. Responses were given in a 7-point Likert type scale ranging from 1 (does not correspond at all) to 7 (corresponds completely).

For the purpose of the study, Teachers' Achievement Goals in Work Questionnaire (TAGWQ; Papaioannou & Christodoulidis, 2007) were used, which has been proved a valid and reliable instrument for the Greek population (Gorozidis & Papaioannou, 2011; Papaioannou & Christodoulidis, 2007). This scale consists of 12 items corresponding to three factors (mastery, performance approach and performance avoidance goals). The answers were given on a 5-point Likert type scale (1= disagree absolutely, 5 = agree absolutely).

Procedure

The translation (back to back translation) and adaptation of the instrument for the Greek context were made by two experts in the field of teachers' motivation. This scale reflects the self-determination theory continuum of behavioral regulations, and is a short measurement of situational self-determined motivation for a teachers' task in their work. Questionnaires were administered to the participants before the first session of the practicum module for the academic year 2011-2012, and they responded anonymously and voluntarily.

Statistics

Descriptive statistics, Cronbach's α and Pearson correlations for each factor were computed, using SPSS 15. Confirmatory factor analysis (CFA) was conducted with the AMOS 16 statistical package, using maximum likelihood estimation method (Figure 3).

Results

Confirmatory factor analysis replicated the fit indices of the original WTMST version and supported a 14 item 5-factor correlated model (Figure 3). The overall fit of the model was good (Hu & Bentler, 1999): TLI =0.976, CFI =0.982, RMSEA=0.039, χ^2 =72.33, df =67 (p>.05), χ^2/df = 1.08. Internal consistency of the instrument were verified with acceptable Cronbach's a (>.70) for every subscale. Internal convergent and discriminant validity, factors' correlations were all in the expected directions (Table 2).

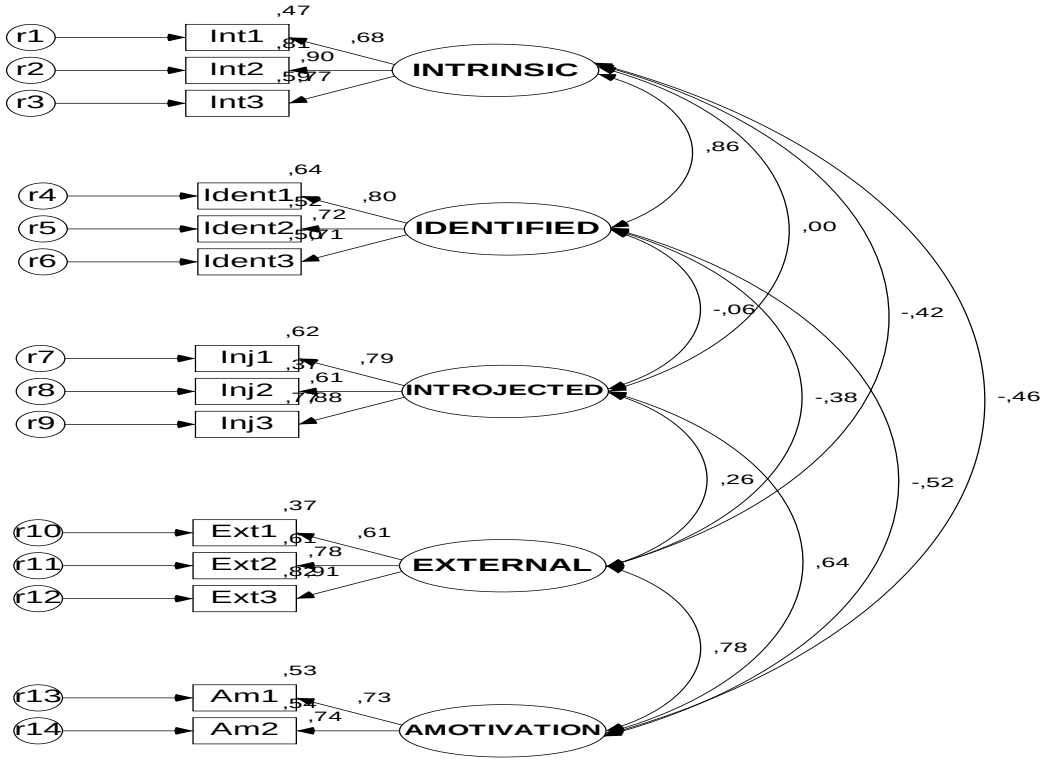

Figure 3 (1): CFA for WTMST standardized estimates (Study 2/ Pilot 1)

External construct validity was evaluated through the relationships (Pearson correlation) of the behavioral regulations with teachers' achievement goals orientations, measured by a valid and reliable instrument for the Greek population (TAGWQ; Papaioannou & Christodoulidis, 2007). Self-determined motivation (i.e., intrinsic, identified) correlated with mastery orientation (goals for Personal development) ($r > .28$, $p < .05$), while non autonomous motivation (i.e., introjected, external) associated with performance orientations (approach-avoidance goals)($r > .28$, $p < .05$), supporting the convergent and discriminant validity of the scale (Table 2).

Table 3: Alphas, means, standard deviation, & factors' Pearson correlation (Study 2/ Pilot 1)

	α	***M (sd)***	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1) Intrinsic	.83	5.2 (1.2)							
2) Identified	.77	5.1 (1.2)	.70***						
3) Introjected	.78	3.5 (1.4)	.09	.07					
4) External	.81	4.2 (1.5)	-.26	-.27	.24				
5) Amotivation	.70	2.9 (1.4)	-.32*	-.38**	.44**	.59**			
6) Mastery goal	.74	4.2 (0.6)	.28*	.41**	-.06	-.17	-.38**		
7) Performance approach goal	.85	3.1 (0.9)	.12	.06	.48**	.24	.17	.03	
8) Performance avoidance goal	.92	2.7 (1.0)	.14	.06	.35*	.28*	.23	-.40**	.42**

Note: *p< .05, **p< .01, ***p<.001

Discussion-conclusions

It seems that mastery oriented teachers, present higher scores in autonomous motivation (intrinsic-identified regulation) and lower in amotivation, than performance oriented individuals. Autonomous motivation in work and education has been proved to lead in more adaptive behaviors than non autonomous motivation (Gagné et al., 2010; Fernet, Guay, & Senécal, 2004; Roth, Assor, Kanat-Maymon & Kaplan, 2007). The patterns of relationships found here, reveal the great value and importance of teachers' disposition to adopt personal development goals for their working lives, which is rather consistent with current literature (Gorozidis & Papaioannou, 2011; Papaioannou & Christodoulidis, 2007).

All the above findings suggest that the Greek version of the WTMST is a valid and reliable instrument and provide initial support for its psychometric properties. This kind of measurements may be proved very useful in the examination of Greek PE teachers' motivation in important work tasks (e.g., in-service training) that affect their job quality.

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Chapter IV Study on Coaches' motivation

4.1. Coaches' self-determination (Qualitative/Publication 2)

Youth football coaches' self-determination to participate in professional training promoting innovative/empowering coaching[8]

Abstract

The purpose of this study was to investigate youth football coaches' motivation to participate in an innovative coach training program. Fifteen coaches, participants of "The Papa Project" in Greece, were individually interviewed in order to give insights about the reasons why they decided to engage in this professional development program. Guided from a prominent theory of human motivation, Self-determination theory (SDT; Deci & Ryan, 1985; 2002), analyses of the qualitative data revealed that coaches were highly autonomously motivated regarding their participation in training, while controlling behavioral regulations existed in a much smaller extent in their sayings. It seems that the application of the theoretical foundation employed in this study can provide the appropriate lenses to explain, and useful guidelines to promote youth football coaches motivation to participate in professional training. Enhancing the quality of coaches' learning motivation seems a wise tactic to foster the quality of coaching provision in youth football.

Key words: Self-determination, autonomous motivation, qualitative inquiry

[8] **Portions of this study were presented in the 13th Conference of Sport Psychology, "Psychology in Sports and Education", Trikala, Greece, 2014 (pp. 118-124) (Publication 2).**

Introduction

Youth sport participation is the most prevalent extracurricular activity for children and adolescents (Fredricks & Eccles, 2006; Larson, Hansen, & Moneta, 2006). While many researchers stress the importance of sport participation for youth development, there are findings that sport activities might hide some risks for young participants (Eccles, Barber, Stone, & Hunt, 2003; Fredricks & Eccles, 2006; Larson et al., 2006). Coaches are in the centre of youth sport environment and play a pivotal role for young players' experiences (Smith & Smoll, 2011; Smith, Smoll, & Cumming, 2007; Smoll & Smith, 1989). It has been acknowledged that coach behavior and practice have a substantial impact on young athletes' motivation, achievement, their psychosocial development and well-being (Conroy & Coatsworth, 2007; Cushion, Ford, & Williams, 2012; Mageau & Vallerand, 2003; Newton & Duda, 1999). This situation makes the provision of quality coaching in every youth sport context, imperative.

Football for some countries such as the UK is the most popular sport to be coached with the highest rates of coaching provision (Market Opinion Research International; MORI, 2004). In US, Youth Football registers over 3.2 million players annually between the ages of five and 19 (http://www.usyouthsoccer.org), and in Canada football is the most popular sport among children (Canadian Soccer Association, 2013). Similarly in Greece, Hellenic Football Federation (HFF) affirms that over 30.000 children play football (Hellenic Football Federation, 2002) and currently there are above 2 million football players in any level (http://www.epo.gr/). Thereby, it is apparent that football coaches' on site behavior influences a huge number of children participating in youth sports academies.

Coaches' professional development

Coaches' profession is a very demanding one in many different aspects, and coaching is a very complex endeavor (Cushion, 2007). For instance, coaching has many special features as a profession, such as that for the most people engaging in this work, coaching is not their primary "day" job (MORI, 2004). In order someone to provide a quality coaching services at any sport level but especially in youth sports they need to acquire diverse skills and knowledge. For example coaches apart from the deep content knowledge of their sport, they must have good understanding of pedagogy principles applying in every age, and very advanced communicating skills while interacting with players, parents, administrators, referees, other coaches etc. As Giges,

Petitpas, and Vernacchia (2004) pointed out, coaches are required to play the multiple role of teacher, parent, mentor, leader, manager, and performer. These high demands of the profession in addition to the amount of people affected by them, makes coaches' continuing professional development a necessity for their entire career. Scholars agree that coaches learning and practice is based upon educational (i.e., formal/non-formal situations, such as coach education, training programs, workshops, clinics etc), and experiential (i.e., informal situations such as athletic and coaching experience, self-reflection etc) processes (Cushion, Armour, & Jones, 2003; Lemyre, Trudel, & Durand-Bush, 2007; Nelson, Cushion, & Potrac, 2006; Werthner & Trudel, 2006; Wilson, Bloom, & Harvey, 2010; Wright, Trudel, & Culver, 2007).

While coaches' learning through experience seems to be very malleable and uncontrollable in its quality and effectiveness, continuous training opportunities provided can be designed properly to enhance coaches' improvement and further development. Although many researchers have questioned the effectiveness of coaches' training courses for their every day practice and development, this kind of learning events remain one of the most fundamental types of their education (Nash & Sproule, 2012; Nelson et al., 2006; Trudel, Gilbert, & Werthner, 2010). Above that, many coaches hold favorable attitudes towards continuing education (Huges 2005; Vargas-Tonsing, 2007; Stephenson & Jowett, 2009; Wright, Trudel, & Culver, 2007), and coach training may become more effective if it will be tailored in order to meet coaches' needs (Erickson, Côté, & Fraser-Thomas, 2007). Recent evidence suggests that trained coaches in contrast to untrained ones can impact positively youth personal and social skills (MacDonald, Côté, & Deakin, 2010). Additionally, youth coaches acquiring interpersonal skills through coach training interventions (ie., Coach Effectiveness Training; CET) has prove to be potentially effective in enhancing self-esteem and enjoyment, and reducing attrition rate and sport performance anxiety of young athletes (Barnett, Smoll, & Smith, 1992; Coatsworth & Conroy, 2006; Smith et al., 2007; Smoll, Smith, Barnett, & Everett, 1993).

However, it seems that coaches' ongoing education is limited comparing to other practitioners (e.g., teachers), and youth sport coaches do not participate regularly in extensive organized training (Gilbert & Trudel, 1999, 2006). Accordingly, there is no evidence that Greece's youth football context is an exception. On the contrary, from HFF's web site (http://www.epo.gr/) one can be informed that, although there are some certification training programs provided for coaches (UEFA-

Pro, A, B)[1], not everyone can participate in them (due to registration cost, remote location, insufficient qualification status etc), and it is apparent that there is no systematic continuing professional development program for youth coaches. This scarcity of large scale or mandated training programs for youth coaches, make their motivation to learn and to participate in any available educational program, very significant.

Coaches' motivation to participate in training

While there is a lot of criticism about the effectiveness of coaches' training interventions (Trudel et al., 2010), none of the studies available, have examined coaches' cognitive engagement in these training programs or their motivation to participate in such interventions which might be a key component for the effectiveness of any educational program they take part. Cushion et al. (2010) in a thorough review, underlined that the existing literature is limited in this area, and emphasized the importance of studying coaches learning motivations. The investigation of motivation is valuable, because it deals with the direction, persistence, duration and intensity of human behavior (Maehr & Braskamp, 1986). For instance, research in many different educational contexts suggest that self-determined types of learning motivation contribute to high quality learning, personal growth and adjustment, better psychological functioning, engagement, creativity and achievement (see Deci, Ryan, & Williams, 1996; Deci, Vallerand, Pelletier, & Ryan, 1991; Niemiec & Ryan, 2009; Reeve, 2002). Thus, it is plausible to assume that if youth coaches are self-determined to be educated in new updated pedagogical approaches to coaching, they are going to improve their skills and to be better prepared to help and foster children's positive development and life.

Although there is an ample body of research on motivation concerning sport participants (athletes, youths etc) (Roberts, 2001a) or other professionals (Gagne´ & Deci, 2005), coaches' motivation literature seems to be limited (Jowett, 2008; McLean & Mallett, 2011; McLean, Mallett, & Newcombe, 2012). And as already mentioned in coaches' literature the subject of coach motivation to participate in learning has often been neglected (Cushion et al., 2010). Indeed to our knowledge there are only few studies addressing this important subject (MORI, 2004; Vargas-Tonsing, 2007). For example Vargas-Tonsing (2007), found that youth team sport coaches were more likely to pursue coaching education if it was a league requirement

and the topics were relevant to their interests, while desire to coach higher levels, convenience, and insurance purposes was found to be very important reasons to decide pursuing further training. According to MORI (2004) unqualified coaches reported that the availability of local and free courses might encourage them to take-up coaching qualifications.

Professionals' motivation to participate in training

Research in other professional fields revealed many different reasons for participating in learning situations. For example reasons for medical practitioners (i.e., physicians) to participate in continuous training were "to keep updated", "the reassurance that what they do is right" or "interaction with new information" (Harrison & Hogg, 2003). Social workers, nurses and pharmacists rated differently the reasons why they participate in educational courses, such as "escape from routine", "compliance with external authority", "professional advancement", "improvement in social skills and relations" (Dia, Smith, Cohen-Callow, & Bliss, 2005; O'Connor, 1982; Garst & Reid, 1999). Grotelueschen, (1985) in his line of research with various professional groups (e.g., surgeons, veterinarians, business professionals, administrators etc) reported five broad categories of reasons for participation in continuous education (i.e., "professional improvement and development", "professional service", "collegial learning and interaction", "professional commitment and reflection", and "personal benefits and job security"). Additionally, he described differences not only between but also within professions as well, and person-related differences for participating in continuing professional education (Grotelueschen, 1985). All these findings imply that depending on the basic characteristics and the context of the profession, the motivation (situational) to attend in-service training activities might be different. All this evidence suggests that the investigation of the particular sub-group of coaches (youth football coaches) is vital if we want to inform and to improve practice about continuous education of this specific professional group.

Although all studies from professional literature mentioned above provide useful information regarding the reasons why professionals may pursue continuous education, they are not founded on a broad applied theoretical framework such as Self-determination theory (SDT; Deci & Ryan, 2002) which can provide general guidelines to improve practice.

Self-determination Theory

SDT postulates that humans are either intrinsically motivated, extrinsically motivated or amotivated based on the reasons why they engage in a behavior (Deci & Ryan, 2002). For instance most of the above reasons for participation in professional training could be categorized as intrinsic (e.g., to keep updated, interaction with new information) or extrinsic reasons (e.g., compliance with external authority, personal benefits and job security) suggesting that SDT could be very useful in understanding how people think regarding their in-service education. Beyond that concept, after thirty years of SDT research and development it has been proposed that a more useful distinction of peoples' behavioral regulations should be autonomous (i.e., intrinsic motivation, integrated, identified regulation) versus controlled (i.e., introjected, external regulation) motivations (Deci & Ryan, 2008). Indeed, an abundant amount of studies in diverse contexts, show consistently that the most positive influence on human behavior stems from autonomous forms of motivation contrary to controlled motivations (see Ryan & Deci, 2000, 2002; Deci & Ryan, 2008). This evidence implies that the investigation of youth coaches' self-determined motivation relative to their training might prove very useful to guide practice. Indeed a relevant study (see chapter 5.1) with secondary school teachers, investigated their motivation to be trained and to implement an educational innovation (Gorozidis & Papaioannou, 2014). What was found is that intrinsic and extrinsic reasons do exist in teachers' cognitions for their participation in professional training. However the most prevalent reasons for teachers' participation in training were the most internalized forms of motivation (i.e., autonomous motivation: intrinsic and identified regulation). And it was apparent that teachers' autonomous motivation has the most optimal influence on their intentions (Gorozidis & Papaioannou, 2014).

Purposes-Significance

Research on youth football coaches' motivation to participate in continuous professional development programs can be informative in new ways by providing insights and shed more light on these coaches' professional behaviors and thinking. This kind of knowledge can inform policy makers on how to design and provide individualized educational programs for youth coaches' life-long learning. It seems that not all coaches value in the same way in-service training, and their opinions may vary concerning the utility of these programs (Chesterfield, Potrac, & Jones, 2010;

Lemyre et al., 2007; Werthner & Trudel, 2006). Thus, knowledge about how to motivate coaches to be life-long learners can become very beneficial. Otherwise many initiatives providing them with professional development opportunities can be undermined and become a privilege for some and not a privilege for all.

The purpose of the current study was twofold, firstly we wanted to explore what motivates Greek youth football coaches' to participate in a professional development opportunity, and secondly to test if the well-established applied theory of human motivation, Self-determination theory (SDT; Deci & Ryan, 1985; 2000) can provide the theoretical framework to gain a better understanding of coaches cognitive processes and decisions to engage in specific behaviors.

The main research question guiding this inquiry was: What motivates coaches to participate in professional training? To address this question the qualitative phenomenological approach was used in order to provide us with insights of coaches' inner motives to participate in a continuing professional development program. According to Patton (2002) a phenomenological study deals with the "lived experience" of people and focuses on the "essence" of these shared experiences, aiming at gaining a deeper understanding and at articulating peoples' every day events. The major sources of data for such kind of studies are in-depth interviews with people having lived experiences of the phenomenon under investigation (Patton, 2002).

Thus, this qualitative inquiry is focused on youth football coaches participating in a professional training program. Since these coaches decided to be involved and to dedicate their time and effort voluntarily in an optional training program, without gaining any incentives or having any obligation to do it, we assume that they did not lack of motivation, but rather we believe that their motivation was in a sufficient level. However, it is much more significant to examine the quality rather than the quantity of coaches' motivation to participate in this training event. The reason is that the quality of motivation to engage in an activity makes the difference. Because high quality motivation leads to many important outcomes and it is reliably connected with adaptive patterns of behavior in work and life, optimal learning, and well-being (Deci & Ryan, 2008; Gagne´ & Deci, 2005).

Method

During the implementation of the FP7 research project "The Papa Project" in Greece, 70 coaches of youth football academies all over the country were recruited to participate in an evidence-based innovative training course and to implement new pedagogical approaches in their every day practices, afterwards. The basic criterion to collect our data was to sample coaches already participating in an in-service educational program in order to explore the personal cognitions facilitating learning behaviors. According to phenomenological approach the best sample for our study would be coaches experiencing the phenomenon of interest (i.e., motivated to participate in training) (Patton, 2002). Thus, all 70 coaches were informed of the general purpose of our study by their educators, and invited to participate in a face-to-face individual interview, while confidentiality was emphasized.

Participants

Based on the abovementioned criteria, purposeful sampling was utilized in order to select information-rich participants (Patton, 1990). A maximum variation sample was obtained to have a wide range of cases regarding their age, experience, region, socio-economic status (Patton, 1990, 2002). Hence, given the small number of project's participants and the voluntary nature of interview studies, our sample consisted of 15 football coaches participating in "The Papa project" in Greece, who were accepted the invitation to be our interviewees. These coaches were aged from 26-52 years (M=34.80 ± 8.1 years) and had an average of 9.2 ± 6.8 years of coaching experience. Most of them (apart from three) had athletic experience as players in football clubs (five had played professionally). All participants held a bachelor degree from Departments of Physical Education and Sport Science of various Greek Universities with a specialization on Football, while five of them held a postgraduate degree. Coaching was their primary job for the eight of them and only three did not hold a coach qualification award (i.e., UEFA B, A, Pro) from HFF (see Table 4/ Appendix). The football Academies that our coaches have been working for, were distributed geographically in 6 large cities (over a 100 thousand people) all over the Greek mainland (Northern, Central, Southern).

Trustworthiness

Before conducting this study, approval from the University's Ethical Committee was obtained. With the completion of the first phase of coaches' training, face to face interviews were carried out (June 2011- November 2011). After signing an inform consent form (by the coaches and the researcher), the individual interviews took place in a convenient location for the coaches (e.g., Football Academy's office, University's hall) and lasted 20-45 minutes. The interviewer (author) was previously trained in in-depth interviewing techniques by conducting ten interviews for another study with similar sample (Physical Education teachers), and a pilot interview for the interview-guide testing of the present research. Prolonged engagement of the researcher with the specific context was established by participating as a coach himself and as an observer (keeping notes) in two 3-hours training workshops of the Papa Project, which were videotaped. Observer's field notes together with workshops' video recording were used later on, as different sources for interviews' data triangulation (Patton, 1990, 2002). Moreover in order to build rapport interviewer engaged in informal conversations with coaches during workshops' breaks and spent some time chatting with them prior to the interview.

Instrument- Data collection

For the needs of the study, a semi-structured interview guide was developed, pilot tested and further improved in order to give insights in the way coaches think and behave regarding their decisions to participate in this training program. The interview guide comprised of questions and probes such as: "Which were the reasons that led you to participate in the program?", "Which was the most important reason for you?", "Have you gained anything from your participation and engagement with Papa project?", "What were your expectations from this project?". The interviews were digitally recorded and transcribed verbatim yielding 281 typed pages (Times new roman-capitals 12, 1.5 spacing) from a total of 503 minutes recordings. Later on, five coaches were randomly contacted via email, to check their interviews' transcripts in order to verify the accuracy of their responses and make clear any misunderstanding in the data.

Data Analysis

The analyses of interviews' data were ongoing (Rossman & Rallis, 1998), which mean that as soon as data were gathered there was a subsequent analysis of them and continual reflection. One peer debriefer (doctoral supervisor) assisted in this process in order to enhance credibility (Creswell, 2003, p. 196). Data analysis was conducted according to the three generic steps proposed by Creswell (2003), (1) organizing and preparing the data, (2) reading through data to gain a "general sense" and to reflect, (3) beginning thorough analysis using a coding process (Creswell, 2003, p. 191). Thematic analysis and coding of raw data followed the three steps procedure in developing themes and codes from a theory driven approach (deductive approach) by Boyatzis (1998, p. 35), including (a) generating codes from theory, (b) reviewing and rewriting the themes and codes, and (c) determining the reliability of codes and coders (Boyatzis, 1998). The reason to this kind of analysis was to see if our data fit well to the very well established theoretical model of Self-determination (Deci & Ryan, 1985, 2000). Hence, the underlying question guiding our analysis was: In what fashion the above mentioned theory of motivation can be applied in the specific population? Furthermore inductive analysis was applied to the data which was not corresponded to any of the theory driven codes. To strengthen the accuracy and the validity of our analyses a second external trained coder, different from the *peer debriefer* (Creswell, 2003), was used to review data and to compare findings until consensus was met (*Analyst triangulation*) (Patton, 1990). Interviews' data transcription, coding and further management were aided by the use of the computer software QSR Nvivo 8.

Results

All the above procedures resulted in one higher order themes, namely "Behavioral regulations", two lower order themes namely "Autonomous motivation", "Controlled motivation" which were comprised of two categories each, *Intrinsic motivation* - *Identified regulation* and *Introjected* - *External regulation* respectively. This categorization corresponds in the self-determination continuum of motivational regulations (Deci & Ryan, 1985, 2000).

Behavioral regulations

Under the theme of behavioral regulations two sub-themes were found, Autonomous motivation and Controlled motivation, with two lower order themes each, Intrinsic-Identified and External-Introjected respectively.

Autonomous motivation

Intrinsic motivation: All of the coaches repeatedly reported intrinsic motives for participating in this educational program. For example C1 said "I wanted to learn more things concerning psychology and what I have to do as a coach…", C2 added "It is a challenge to learn always new things and this program on its own is a challenge", C3 mentioned "Because I like it that's why I participate… because I like it and I want to keep up with the era. It has to do with something new…this is the more interesting that's why it challenged me and impressed me", C4 stated "First of all knowledge was something that interested me, something which I believed I want and already tried to do, so I think knowledge was the first, it was, yes I think knowledge...I am doing it for the experience and for the knowledge", C5 affirmed "To get knowledge, that is what I wanted and I think from there it was started… to get insights on a subject that I wasn't well informed…", C6 highlighted "Primarily, I wanted to be informed, to learn things, this pushed me", C11 quoted "The reason is that this is something new innovative", C12 commented "I have accepted to participate instantly. It looked interesting to me and I said why not!", C13 pointed out "I like to learn, because I see always new things", C14 asserted "I was curious, curiosity if there is something new", C15 mentioned "I like very much the subject of the seminar (empowering coaching).

All the above coaches' quotes are typical evidence of their intrinsic motivation to participate in this structured learning experience. According to SDT intrinsic motivation conveys personal interest, curiosity to learn new things, inherent satisfaction and enjoyment from the participation in an activity (Ryan & Deci, 2000). Two types of intrinsic motivation identified in coaches' statements, *to know* (i.e., engaging in a task for the enjoyment derives from learning new things) and *to experience stimulation* (i.e., performing an activity for the excitement and fun stems from it) (Vallerand et al., 1992). In line with our findings, recent studies have been reported high levels of coaches' self-determined motivation regarding their involvement with coaching (McLean & Mallett, 2011; McLean et al., 2012).

Identified regulation: Regarding this type of behavioral regulation again all coaches identified the task of their learning as something personally important and helpful for them and their players (Ryan & Deci, 2000, 2002). Example of coaches statements are: "… for this I participate in learning, what I can get from it and whatever I can offer… it will be good for me and for my players" (C1), "Because I 'm

still working as a coach, of course it will help me" (C2), "I believe that I have many things to gain from this, me and the children of course" (C4), "I want to help kids and I believe that this project would give me the possibility to learn some methods that I didn't know" (C7), "The most important reason for me personally to participate is the supplies (i.e., knowledge) I got as a coach in the project, more weapons on my arsenal" (C9), "The most important reason for me is the children. When I encounter children with some strange (i.e., maladaptive) behaviors let's say, or the way I will help a team, this is essentially my motivation" (C10), "I want to help the kids of the academy through my training" (C15). Coaches' strong desire to help their players' development was apparent in another qualitative study with coaches from a variety of sports and levels (McLean & Mallett, 2011). The fact that these coaches identified the significance of the project for them and their players was no surprise. Accordingly it has been found that teachers may participate in a project if they consider it highly important (Schellenbach-Zell & Gräsel, 2010).

Controlled motivation

Introjected regulation: Relative to internal pressures to engage in the educational project C1 reported "when I think seriously I say that good things are acquired with pain (toil)", implying that in his mind training and new knowledge acquisition were a *no pain, no gain* situation, and therefore not very pleasant to do. Relevantly, C11 mentioned that "You have to learn continuously new things, every day it goes by, you have to learn things, you have to be very cautious" which shows that new knowledge acquisition is something "you have to do" putting pressure on yourself, thus not necessarily something very enjoyable. In similar vein C13 underlined "You have to not stop learning on your subject, you have to deal with kids with humans and you have to know everything. It's a very responsible position" and another coach stated,

> I have to maintain contact. As we have said you have to search (look for new information) constantly, if you don't then you are left behind, you forget what you've learnt, to say. So it is good to keep up and put yourself sometimes to try to stay close to your subject. Because, the more you leave it the worse for your work. (C12)

External regulation: Although not the most obvious in coach's words, external motives were evident in some quotes. For example, C1 said "I wanted to learn more

things about psychology and how to act as a coach, in order kids to be happy when they leave training" and relatively C3 added

> You have to deal with kids and parents, you have to be very careful because the current demands are very high, the customers, the friends, I don't know how to address them, are all demanding, they look into every detail and I think that this project will help me much more as a person and as a professional.

These quotes reveal that some coaches through their training want to keep their players satisfied, and social milieu, thus to meet external demands (Ryan & Deci, 2002). In addition when coaches were asked about the certification they will obtain from their participation in the project, generally they considered it as something good but not the most important reason to participate in the program. Some representative quotes are "I believe the certificate might help me in the future" (C4), "OK this too but it was second-third (i.e., important reason) for me, to participate in the project" (C8), "For me it was the second (i.e., important reason) I didn't have it as my first reason" (C9).

Discussion

The main scope of this study was to understand how coaches think and behave regarding their professional development-education, guided by prominent theory of human motivation. Overall our findings are in accordance with SDT literature and with previous studies on coaches' motivation to coach (McLean & Mallett, 2011; McLean et al., 2012). It was no surprise the fact that our coaches exhibited both types of motivations, but with higher degree of autonomous types of behavioral regulations than controlled. In accordance, high scores on autonomous motivation (intrinsic and identified regulation) to participate in professional training were also evident in a study with teachers (see chapter 5.1), where again autonomous motivation found to co-exist with some controlling types of motivation but in a much higher degree than controlled motivation (Gorozidis & Papaioannou, 2014). Our findings together with evidence from the literature suggest that the theoretical perspective used to interpret our data, is appropriate for in-depth understanding of coaches psychological functioning.

Research conducted in educational settings demonstrated that autonomous motivation to learn is essential for high quality learning (Deci, Ryan, & Williams,

1996; Deci, Vallerand, Pelletier, & Ryan, 1991; Niemiec & Ryan, 2009; Rigby, Deci, Patrick, & Ryan, 1992). The findings indicating that coaches were highly autonomously motivated imply that they might have engaged optimally in this training situation. The effectiveness of the particular program on coaches' practice remains to be examined. However, the relative literature suggests that this kind of involvement regarding coaches' in-service training has the potential to raise the effectiveness of any educational program they participate.

Conclusion

It is evident that many types of behavioral regulations exist in the self simultaneously. Which one is the most prevalent in every situation, it is very difficult to determine.

Our analyses, suggest that coaches participating in training are highly autonomous motivated persons. Participants consciously described that their primary reason for their engagement in the program was to learn new things and to develop their skills, yet there were other reasons external in nature underlying in their answers such as helping players to grow, obtaining certification, be accepted by significant others. Our findings are rather consistent with studies in other domains, regarding people's motivation to participate in formal learning, demonstrating that adult practitioners have the propensity to be internally motivated to pursue professional knowledge in order to enhance their competencies (Dia, Smith, Cohen-Callow, & Bliss, 2005; Garst & Ried, 1999; Laszlo & Strettle, 1996).

Given the scarcity of studies examining coaches learning motivation the current study adds to the literature by giving insights about the cognitive functioning of youth football coaches. Of course based on the research design of our study we could not claim the generalizability of our findings, and more studies must be conducted utilizing mixed and longitudinal methodologies. However, it is evident that SDT could provide the theoretical foundation to guide policy makers, who aim at improving coaching quality in youth sports and football in particular.

Baring this in mind, officials can foster coaches' autonomous motivation by creating structured learning environments that fulfill their innate psychological needs of autonomy, competence and relatedness (Deci & Ryan, 2002). In addition, the satisfaction of coaches' basic psychological needs may lead to higher levels of well-being and to better coaching provision towards their athletes (Stebbings, Taylor, & Spray, 2011). Suggestions on how to meet coaches needs (by administrators,

managers, etc) in order to facilitate autonomous motivation, by promoting the internalization process of external motives are beyond the scopes of the current study and are available elsewhere (see Baard, 2002; Deci & Ryan, 2008). Policy makers should focus on increasing coaches' autonomous motivation, through promoting collaboration, experimentation, and by putting more significance on proofs of knowledge and skill development throughout their careers than on wins-loses aggregate. It is obvious then that an autonomous motivated coach will pursue life-long learning in his profession by engaging in every educational opportunity available for his training.

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Footnotes

[1]UEFA: Union of European Football Associations has established licence courses UEFA-Pro, A, B awards, in member countries. UEFA A licence is recognized as the second highest-level coaching certificate.

Appendix

Table 4. Participant background information (Study 1; Coaches)

Coaches	Age	Coaching experience	Athletic experience	Educational qualification	Coaching qualification	Primary job	Family
C1	37	12	10	BPhEd	UEFA A	Medical sales representative	2 children
C2	52	28	15	BPhEd	FA license	PE teacher	2 children
C3	50	16	20 (pro)	BPhEd	UEFA A	PE teacher	3 children
C4	29	7	13 (pro)	MSc	UEFA A	Coach	single
C5	42	8	17 (pro)	PhD	UEFA Pro	Academys' head - Coach	3 children
C6	28	1	22 (pro)	BPhEd	No	Café owner	1 child
C7	29	6	15	BPhEd	UEFA A	Coach	single
C8	29	6	15	BPhEd	UEFA A	Coach	single
C9	30	7	15	BPhEd	UEFA A	Coach	single
C10	32	7	0	MSc	UEFA B	Coach, trainer	1 child
C11	26	2	15	BPhEd	UEFA B	Salesman	single
C12	33	7	0	BPhEd	No	Coach	single
C13	28	3	18	MSc	UEFA B	Coach	single
C14	37	14	20 (pro)	BPhEd	UEFA A	Academys' owner - Coach	1 child
C15	40	14	10	MSc	No	Municipal employee in Sport management	2 children
Mean	34.8	9.2					
SD	8.1	6.8					

BPhEd: Bachelor in Physical Education & Sport Science. FA: Football association

Chapter V Studies on teachers' motivation

5.1. Teachers Self-determination (Mixed/ Publication 4)

Teachers' motivation to participate in training and to implement innovations[9]

Abstract

Based on Self-determination theory, a mixed method design was used to explore 218 teachers' motivation and intentions regarding participation in training and teaching of an innovative academic subject (i.e., *Research Project*). Structural equation modeling revealed that autonomous motivation positively predicted teacher intentions to participate in relevant training and to implement innovation in the future, while controlled motivation did not. The findings imply that policy makers should encourage strategies that foster teacher autonomous motivation for promoting successful implementations of educational innovations.

Keywords: Self-determination, educational innovation, professional development, participatory motivation, intentions, autonomous motivation

Highlights

- Self-determination theory is beneficial in understanding teachers' work motivation
- Autonomous motivation predicts teachers' intentions to participate in training
- Autonomous motivation predicts teachers' intentions to teach an innovative subject
- Controlled motivation does not predict teachers' intentions

[9] **It was published by Elsevier in the international scientific peer-reviewed journal *Teaching & Teacher Education, volume 39, 1-11,* 2014. (Publication 4)**

1. Introduction

In recent years, school innovations have become increasingly important for worldwide reforms in an attempt to improve education and to switch from traditional teaching practices (teacher-centered) to more creative student-centered approaches (e.g., cooperative, project-based learning). A notable example is Greece where many top-down reform efforts have been made in the last ten years in an attempt by the Ministry of Education to improve education and to align national curricula with international trends (e.g., Cross Thematic Curriculum, 2003; New books, 2006; New School-Priority the student, 2011). In the most recent educational change, an innovative new course namely *Research Project*, was introduced to Greek high schools (10th to 12th grade) (http://www.pi-schools.gr/; http://www.minedu.gov.gr/). This is based on four pedagogical principles, (a) Inquiry based learning, (b) Interdisciplinary teaching-collaboration, (c) Differentiated learning, (d) Cooperative learning (Ministry of Education, 2011). The new subject requires students to work on interdisciplinary projects in small groups, and teachers to facilitate initiative, choice, experimentation, and individual/group responsibility (Ministry of Education, 2011). In Greece, apart from inductive training, further in-service education is not obligatory; in this context the first act was to support the implementation of this innovative subject by way of an optional in-service training program for high school teachers, provided by The National Organization for Teachers' Training (i.e., OEPEK) in June of 2011.

In the international educational arena, innovations are often introduced via centrally organized in-service teacher training programs (or continuous professional development programs). However, in many cases, participation in these programs is optional, and when it is mandatory there is no way of ensuring teachers' optimal engagement in these learning experiences. As Van Eekelen, Vermunt, and Boshuizen (2006) underlined teachers' *will to learn* must be present before their engagement in any learning activity regarding innovations. In their small scale qualitative study, they found that it was only the teachers who were *eager to learn,* and agreed with the new innovative views of teaching, who undertook the appropriate action to do so (Van Eekelen et al., 2006). Accordingly, Shulman and Shulman, (2004) proposed that teachers' willingness to learn (i.e., motivation to learn) is one of the basic features of teacher learning and successful professional development. Motivational theorists suggest that autonomous motivation to learn is instrumental for optimal learning and performance, individual adjustment and psychological functioning, greater creativity,

and persistence in many different educational settings (see Deci, Ryan, & Williams, 1996; Niemiec & Ryan, 2009; Reeve, 2002). This means that teachers' motivation to be involved in new learning experiences, such as in-service training programs, should be fundamental for the success of these programs.

In the present study we examined teachers' motivation in determining their intentions to participate in training and to implement the innovative subject *Research Project*. The examination of teachers' intentions and their prediction by motivational variables is very important because according to the Theory of Planned Behavior (TPB; Ajzen, 1991) intentions have great possibility of being translated into behavior (Ajzen, 2002).

Our primary focus was teachers' motivation to participate in training as there is a consensus that students' learning is dependent on teacher quality, and therefore, teacher professional development is essential (Darling-Hammond, 2000; Fullan, 2009; Villegas-Reimers, 2003). The substantial influence of teachers' quality on student achievement and the connection between teachers' professional development and school improvement has been supported by both quantitative and qualitative studies (see Darling-Hammond, 2000; Villegas-Reimers, 2003; Yoon, Duncan, Lee, Scarloss, & Shapley, 2007).

The second focus of our study was the examination of teachers' motivation to implement the innovation because teachers play a key role in the implementation of *Research Project* by organizing, grouping, motivating and guiding students (Ministry of Education, 2011). In recent years, the influential position of teachers in the educational procedure has led to the expansion of research in examining the contextual and dispositional factors influencing teachers' participation and implementation of school innovations. Findings from these studies support the idea that teachers' motivation is one of the most essential determinants for the successful implementation of educational innovations (Abrami, Poulsen, & Chambers, 2004; Cave & Mulloy, 2010; Gorozidis & Papaioannou, 2011; Lam, Cheng, & Choy, 2010; Schellenbach-Zell & Gräsel, 2010).

Recent studies show that teachers' motivation and cognition (e.g., self-efficacy, attitudes, appraisals, beliefs, goals) are vital for the impetus of their workplace learning (Geijsel, Sleegers, Stoel, & Krüger, 2009; Kwakman, 2003; Lohman, 2006; Runhaar, 2008; Vermunt & Endedijk, 2011). However, only few studies focused on teachers' reasons for participating in formally organized training

promoting educational innovation. Livneh and Livneh (1999) administered the Characteristics of Lifelong Learners in the Professions Scale and found that self-motivation (internal) and external motivation (networking with others/ salary improvement) to learn predicted K-12 educators' participation in professional development activities during the previous year. Hynds and McDonald (2009) in their qualitative study found that teachers decided to participate in a school- university partnership program mainly for intrinsic reasons (e.g., to link theory to practice, to improve students' learning, to collaborate, for pleasure, for knowledge) but some extrinsic reasons also emerged (qualification achievement, fee payment). Stout (1996) recognized four motives affecting teachers' participation in professional development: gaining new skills/ knowledge to enhance classroom practice, salary enhancement, eligibility to compete for a position/ certificate maintenance, career mobility/ CV building. In a similar fashion, studies in other work domains show that employees' motivation to engage in occupational training and development is determined by internal motivations (e.g., curiosity, knowledge) and external ones (e.g., compliance with authority, professional benefits) (Dia, Smith, Cohen-Callow, & Bliss, 2005; Garst & Ried, 1999; Noe & Wilk, 1993; Tharenou, 2001). Although these studies underscored the importance of both intrinsic and extrinsic reasons, we expected that some of these extrinsic reasons would be irrelevant for Greek teachers because their participation in continuous professional development is not considered a work duty and there are no monetary rewards in the form of payment or salary improvement for these activities (European Commission/ EACEA/ Eurydice, 2013).

Intrinsic and extrinsic motivations are key-constructs of Self-Determination Theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000a) which can be used to investigate teachers' task specific motivation (i.e., participation in training, teaching innovation). Recently, some researchers supported the utilization of an integrated model with constructs from multiple theories as the most appropriate framework for the study of teachers' motivation (Cave & Mulloy, 2010; Jesus & Lens, 2005). However, SDT may uniquely provide a sufficient solution for the study of teachers' situational-level motivation (Vallerand, 1997). Especially in a context where monetary incentives are absent, engagement in continuous professional development is voluntary, and as teachers' wages have decreased substantially as a result of the Greek economic downturn (European Commission/ EACEA/ Eurydice report, 2012), SDT might unveil important intrinsic incentives for individuals' optimal motivation.

In addition, it is a well-established theory applied in various domains internationally offering guidelines to improve practice (see Deci & Ryan, 2008; Ryan & Deci, 2000b), and it would be informative for policies aiming to foster teachers' involvement with educational innovations.

Based on SDT, Fernet and his colleagues (Fernet, 2011; Fernet, Senecal, Guay, Marsh, & Dowson, 2008) suggested that teachers' quantity and quality of motivation presents a wide variety, relative to the various work-related tasks they have to carry out. Indeed, highly motivated teachers in teaching or in class preparation could be less motivated to participate in further training and professional development, for a number of reasons: some training programs might be limited, or located out of their reach; or they feel satisfied and effective in the way they teach so no training is needed; or they just do not have the possibility, or the will, to devote their personal time for these activities. To this end, teachers' intentional engagement in any in-service training program becomes extremely important and worthy of scrutiny. Therefore, because in SDT, a pivotal concept is the existence of choice in a person's behavioral regulations, it provides an appropriate framework to base a study on teachers' volitional engagement in professional training promoting school innovations.

1.1 Self-Determination Theory (SDT)

SDT theory posits that peoples' behavior can be intrinsically motivated, extrinsically motivated, or amotivated depending on the reasons for their involvement in a given task (Ryan & Deci, 2002). Intrinsic motivation refers to engaging in an activity for the inherent enjoyment and pleasure derived from it, without the mediating effects of external rewards or pressures, and it is considered as the most self-determined type of motivation (Deci & Ryan, 1985). On the other hand, extrinsic motivation concerns the participation in a task for contingent outcomes and not for the internal satisfaction derived from the task itself. According to SDT, there is a number of extrinsic motivation types that lie across a continuum from low to high self-determination. Thus, extrinsic motivation can be distinguished in a) external regulation, where reasons for engagement correspond to the attainment of material incentives, recognition, rewards, or to avoid punishment, b) introjected regulation, where self-determination is relatively higher than in the case of external regulation, but the reasons for engagement in an activity are not well internalized, such as when

individuals become involved in a task in order to avoid feelings of guilt or shame, c) identified regulation, were reasons for doing an activity reflect the pursuit of fully-internalized meaningful outcomes that demand effort which is not pleasurable, and is considered as a highly self-determined form of extrinsic motivation (Ryan & Deci, 2000a). Amotivation refers to the lack of volition to do something, where people enact passively, unwillingly, or have no intention of doing the activity (Ryan & Deci, 2002). In addition, Deci and Ryan's theory makes a significant distinction between autonomous or self-determined (i.e., intrinsic motivation, identified regulation) and non-autonomous or controlling (i.e., intojected, external regulation) types of motivation. The difference between autonomous and non-autonomous external types of regulations lies in the degree that the person internalizes behaviors and experiences choice. Three decades of SDT development shifted the focus from intrinsic versus extrinsic motivation, to autonomous versus controlled motivation (Deci & Ryan, 2008). An ample body of research utilizing this concept has revealed that not only intrinsic motivation, but well-internalized forms of extrinsic motivation (e.g., identified regulations) have the most positive impact on human behavior in various life settings, in contrast to controlling types of motivation (i.e., introjected, external regulations)(see Ryan & Deci, 2000b, 2002; Deci & Ryan, 2008). In the literature the terms: self-determined types of motivation/ autonomous motivation/ self-determined motivation (i.e., intrinsic motivation, identified regulation), and controlling/ non-autonomous/ controlled motivation (i.e., introjected, external regulation) are commonly used interchangeably. For reasons of clarity, the terms autonomous versus controlled motivation will be adopted in the rest of the paper.

1.2 Self-determined motivation in work and teaching profession

Researchers in workplaces have systematically demonstrated that autonomous motivations are strongly related to positive outcomes (Baard, Deci, & Ryan, 2004; Blais, Briere, Lachance, Riddle, & Vallerand, 1993; Deci et al., 2001; Gagné et al., 2010). For example Gagné et al. (2010) found positive meaningful relationships between autonomous motivations and optimism, job satisfaction, affective and normative commitment, well-being, and self-reported health; whereas negative relationships emerged with turnover intentions and psychological distress. Also, autonomous motivation has been positively associated with psychological health,

work and life satisfaction, and negatively with burnout and turnover intentions (Blais et al., 1993; Richer, Blanchard, & Vallerand, 2002).

Studies investigating teachers' self-determination in the workplace produced similar results. Fernet, Guay, and Senécal (2004) found that autonomous motivation at work had positive relationships with job control, and personal accomplishment; and negative associations with job demands, emotional exhaustion, and depersonalization. University professors high in both autonomous motivation and job control could adjust better to job demands, and cope with burnout (Fernet et al., 2004). In a recent survey, Demir (2011) indicated that teachers' intrinsic and extrinsic motivation significantly predicted students' achievement. But the most important predictor of student engagement was teachers' intrinsic motivation (Demir, 2011). In addition, it has been demonstrated that teachers who are intrinsically motivated in teaching are more likely to support and promote their students' autonomy, which in turn leads to increased intrinsic motivation of students (Pelletier, Séguin-Lévesque, & Legault, 2002; Reeve, Bolt, & Cai, 1999). Roth, Assor, Kanat-Maymon and Kaplan (2007) found that teachers who experienced more autonomous (self-determined) types of motivation to teach, reported an increased sense of personal achievement, and reduced emotional exhaustion. Autonomous motivation for teaching was positively associated with students' autonomous motivation to learn, and students' perception that their teachers supported their autonomy (Roth et al., 2007). In the same vein, Taylor, Ntoumanis and Standage (2008) showed that highly autonomous motivated Physical Education (PE) teachers try harder to understand their students, provide more help and support, give a meaningful rationale for the content of their teaching, in contrast to less autonomous motivated PE teachers. More recently, Hein and his colleagues (2012) in a cross-cultural study in five European countries affirmed that autonomously motivated teachers were used to teaching by utilizing student-centered styles; while non-autonomous teachers employed more teacher-centered styles.

From Wang and Liu's (2008) study it seems that pre-service teachers with higher levels of self-determined behavior have the tendency to demonstrate higher confidence in teaching the national curriculum, and they seem more satisfied with their training. Lam et al. (2010) found that autonomous motivation (intrinsic and identified) was highly and positively connected with positive attitudes towards persistence in innovative teaching; while the relationship with negative attitudes was high and negative. Lower levels of autonomous motivation were associated with

negative attitudes towards persistence in educational innovation (Lam et al., 2010). Consistently, studies with Greek teachers present similar findings. Christodoulidis (2004) found that the higher the teachers' autonomous motivation, the greater their job satisfaction, and involvement in extracurricular activities to improve their self-efficacy. In addition, Gorozidis (2009) surveyed a sample of Greek teachers and noticed that their intrinsic motivation in work was positively connected to job satisfaction, mastery orientation, and self-efficacy to implement the newly introduced curriculum. It was found that the higher the intrinsic motivation of teachers, the higher the degree of implementation of the innovative curriculum and teachers' positive attitudes towards it, as well as their intentions to implement it in the future (Gorozidis, 2009). Also, an older study with undergraduate PE teachers showed that intrinsic motivation was a strong predictor of intention for future participation in similar courses (Goudas, Biddle, & Underwood, 1995).

It seems that teachers' autonomous motivation in every aspect of their work (e.g., in-service training) is a vital ingredient for their optimal functioning and professional growth. Fernet et al. (2008) showed that autonomous types of motivation (intrinsic, identified) are more domain specific than controlling types (introjected, external) for teachers. Thus, they suggested that it is very important to assess self-determined regulations (intrinsic, identified) in any different task relevant to teachers' work, because the task characteristics may change their level of autonomous motivation. Moreover, according to the SDT continuum they demonstrated that a simplex pattern of relations (see Ryan & Connell, 1989) exist in teachers motivational regulations for doing the same work task, meaning that every regulation correlates more positively with adjoining regulations than with more distant ones (Fernet et al., 2008).

1.3 Theoretical-methodological importance, purpose

A methodological strength of the present SDT-based study is the investigation of motivational hypotheses in an authentic environment where participants chose and implement very meaningful tasks. Task importance is critical to induce mastery/task-involving goals and intrinsic motivation (Nicholls, 1989, p. 88), which are necessary in motivation studies where individuals have a reason to achieve, to select a task and to exert maximum effort (Papaioannou, Zourbanos, Krommidas, & Ampatzoglou, pp. 78-80). Indeed, if we want to understand teachers' situation-specific motivation, such

as teachers' *will to learn* (e.g., Van Eekelen et al., 2006) or *to implement* (e.g., Abrami et al., 2004) an innovative subject, we need to understand the underlying reasons that determine the consistency of behavior across situations which offer the same meaning for goal adoption that initiate and sustain behavior to do so (Mischel & Shoda, 1998).

Although relevant studies in education utilize either quantitative or qualitative methodology, here we select a mixed methods longitudinal design with the *concurrent transformative approach* (Creswell, 2003, p. 219), where the theoretical framework of SDT guides the research, while quantitative and qualitative data are collected simultaneously in order to triangulate and to complement participants' responses (Bryman, 2006). Hence, we gather quantitative and qualitative data (qualitative open-ended questions, close-ended questionnaires and written interviews) twice, from purposefully selected teachers having experienced the phenomenon under investigation (Patton, 2002).

To summarize, the purpose of the present study is to examine whether the SDT framework is suitable in giving insight about teacher situation-specific motivation in the circumstances under view. Moreover, we aim to explore what types of teacher motivation have the most optimal effect on their intentions to participate in future training, or to implement the new subject the following year.

1.4 Research questions-Hypotheses

Based on literature review and SDT framework, research questions with corresponding hypotheses were formulated to guide the present study:

1. Why do teachers take part in training programs promoting educational innovations, if participation is voluntary?

   Hypothesis 1(H_{1a}): Behavioral regulations of SDT will be present in teachers' responses. Evidence from relevant studies (e.g., Livneh & Livneh, 1999; Hynds & McDonald, 2009) implies that teachers will point out intrinsic as well as extrinsic reasons for participation, representing the SDT continuum.

   Hypothesis 1(H_{1b}): A simplex pattern of relationships between variables will be present according to SDT (Ryan & Connell, 1989). As participation is not mandatory, it is expected that autonomous motivation will prevail.
2. Do all types of motivation optimally influence teacher intentions for future involvement with innovation?

Hypothesis 2a (H_{2a}): Teacher autonomous motivation to participate in training will positively predict their intentions to future engage in similar training; while controlled motivation will not have this positive effect.

Hypothesis 2b (H_{2b}): Teacher autonomous motivation to teach the new innovative subject will have a positive effect on their intentions to undertake teaching it the following year; while controlled motivation will not.

These relationships are to be expected because SDT literature presented above suggests that autonomous motivation leads to positive results; while controlled does not.

2. Methods

2.1 Procedure and Participants

The present research was conducted the first year of the implementation of the new subject *Research Project* in Greek high schools. Prior to the study, approval from the ethics committee of the authors' university was obtained. The participants of the first training program (a fifteen-hour workshop conducted over two consecutive days) were from all over Greece (N=1010) and had been invited via e-mail, to respond anonymously and voluntarily to the questionnaires. Additionally, an accompanying letter containing the study objectives was sent, assuring for their anonymity and asking teachers to provide some identification data in case they wished to participate in a subsequent survey, or whether they wished to be interviewed (in person or by e-mail) for research purposes. All participants of the training program were selected centrally (i.e., Ministry of Education) after they had sent an electronic application individually, responding to the invitation by the Ministry, without however having any obligation to do so. For this interdisciplinary project-based learning subject, all teaching specializations (e.g., science, math, physical education, technology, language) were considered suitable to teach it. Thus, participants in the training program and in the current investigation were in-service high school teachers, regardless of area of specialization.

During the school year of 2011-2012, e-mail questionnaires, using web-based software, were mailed to the teachers twice (October/beginning - June/ending). In both instances after the first mail dispatch, two reminders were sent within the following fifteen days. Responses obtained in Time 1 (beginning) survey were 218 (response rate 21.6%), from these, the teachers who completed the questionnaire in

Time 2 (ending) were 71. In addition four teachers accepted to reply to written interviews (by e-mail), fifteen days after the completion of Time 2 survey. Participants' mean teaching experience was 14.13 years (SD=7.19, ranging from 2-31 years of teaching); 80 were males (37%) and 138 females, while half of them (n=109) held a postgraduate degree. According to the 2006 census by the Center of Educational Research, the sample of the study may be considered a national representative in terms of geographical distribution, and teaching experience (13.1 years), but not in terms of gender (50% males) or qualifications (only 8.7% held a master's) (Educational Research Center, 2007).

2.2 Measures (Instruments)

2.2.1 Quantitative

2.2.1.1 Time 1(T1)(N=218)

For the quantitative part of the questionnaire, teachers' self-determined motivation to participate in professional training was assessed using the Work Task Motivation Scale for Teachers (WTMST; Fernet et al., 2008) an instrument based on SDT, which was translated and adapted in Greek (Gorozidis & Papaioannou, 2012). This instrument consists of 5 subscales (intrinsic, identified, introjected, external, amotivation) with 3 items per scale, a total of 15 items. Following the stem "Why have you participated in this training program?" participants responded to items as, "Because I like doing it" (intrinsic), "Because I consider my training important for the academic success of my students" (identified), "To not feel bad if I don't participate in training" (introjected), "Because my position might be in danger if I don't" (external), "I don't know, I don't see any purpose in this training" (amotivation). Answers were given on a 7-point Likert type scale ranging from 1 (does not correspond at all) to 7 (corresponds completely). Cronbach alpha for WTMST scales were satisfactory (Intrinsic= .81, Identified= .75, Introjected=.79, External=.79, Amotivation= .67) and confirmatory factor analysis produced satisfactory goodness of fit indices (TLI = 0.956, CFI= 0.967, RMSEA= 0.046, χ^2= 117.24, *df*= 80, χ^2/*df*= 1.47).

2.2.1.2 Time 2(T2)(N=71)

Similarly to *T1*, in *T2* a slightly modified version of the same instrument (WTMST; Fernet et al., 2008; Gorozidis & Papaioannou, 2012) was used, in order to measure

teachers' self-determination to teach the new subject. Following the stem "Why do you teach the new subject *Research project*?" participants responded to items such as, "Because I like doing it" (intrinsic), "Because I consider the subject of *Research project* important for the academic success of my students" (identified), "Because I would feel guilty not teaching it" (introjected), "Because my position might be in danger if I don't" (external), "I don't know, I don't always see the relevance of teaching it" (amotivation). Again, Cronbach's alphas were good (Intrinsic= .90, Identified= .84, Introjected=.83, External=.66, Amotivation= .76), and goodness of fit indices (TLI = 0.934, CFI= 0.950, RMSEA= 0.068, χ^2= 105.53, *df*=80, χ^2/*df*= 1.32) were acceptable.

In addition, teacher intentions to participate in future in-service training courses regarding the innovation were measured by a 2-item scale which was constructed based on TPB recommendations (Ajzen, 2002). The items were "During the next season I plan to participate in a training program about the implementation of the new subject", and "During next season I am determined to participate in a training program about the implementation of the new subject". In the same way teacher intentions to teach the new subject next year were measured by two items "During next season I plan to teach the new subject *Research Project*", and "During the next season I am determined to teach the new subject *Research Project*". Participants responded in 7-point semantic differential scales (likely/unlikely, yes/no). Cronbach's alpha of the scales were .97 and .82 respectively.

In this study a basic aim was to test the impact of autonomous and controlled motivation on teacher intentions to participate in further training and to implement the new subject. Because amotivation measures the quantity rather than the quality of motivation, the present participants were motivated enough to get involved in this innovative subject, and as we wanted to keep the minimum amount of items, we decided to discard this variable from further analyses.

2.2.2 Qualitative

2.2.2.1 Time 1

In order to triangulate and to complement quantitative data with qualitative, all teachers but two provided answers to two open-ended questions "What were your reasons for registering for the *Research Project* training course?", and "Which was the most important reason for you?". To eliminate bias and to avoid possible influence

on the teachers' answers, these two questions were placed on different pages prior to the SDT electronic questionnaire and participants did not have the option of revising their responses.

2.2.2.2. Time2

In *T*2, qualitative data were obtained from four written interviews. The interview guide used included two questions relevant to this study. "What were the reasons that led you to participate in the training?" and "Which is the most important reason for you?"

Overall, inter-coder agreement for these analyses reached about 98% (k_w=.95).

2.3 Data analysis

To evaluate the factorial validity of the instruments confirmatory factor analyses (with maximum likelihood estimation method; Amos 16) were conducted, while scales reliability was verified with Cronbach's alpha. In order to test hypotheses H_{1b}, scales scores and correlations were computed. In order to test hypotheses H_{2a} and H_{2b}, two structural equation models (SEM) were constructed. Firstly, to test if autonomous motivation to participate in training can predict teacher intentions to participate in further relevant training (H_{2a}), and secondly, to test if autonomous motivation to teach the new subject predicts teacher intentions to implement it the following year. (H_{2b}).

Qualitative data from open-ended questions and the handling of the written interviews was aided by the computer software QSR Nvivo 8. Raw data were analyzed following the first three generic steps suggested by Creswell (2003) consisting of a) preparation and organization of the data, b) thorough reading to gain a *general impression* and c) comprehensive *coding*, creating codes and categories from text data (Creswell, 2003, p. 191). Thematic analysis of the data was conducted using a theory-driven approach using the three-step procedure proposed by Boyatzis (1998): *a) generating a code, b) reviewing and revising the code in the context of the nature of the raw information, and c) determining the reliability of the coders and therefore the code*. (Boyatzis, 1998, pp. 35-36). This kind of analysis was chosen because our purpose was to check if our data fit well into the SDT framework (H_{1a}). However, the data that did not fit in any theory-driven categories were further analyzed inductively, generating new themes. In order to establish credibility and to check for the accuracy of the findings a *peer debriefer* (Creswell, 2003) enhanced the whole procedure by reviewing and asking questions, while a second analyst (coder) assisted the coding process, until consensus was met (*Analyst triangulation*) (Patton, 1990).

3. Results

3.1 Teachers' motivation to participate in training

3.1.1 Quantitative: Time 1 (N=218)

Descriptive statistics, alphas, and factors' correlations for *T1* measures are presented in Table 5. Variables' correlations were all in the hypothesized directions supporting the validity (convergent and discriminant) and reliability of the measures. Consistent with the self-determination continuum, all correlations between the five behavioral regulations (latent variables) revealed a simplex pattern where conceptually close constructs correlated positively to a higher degree compared to distant ones (Ryan & Connell, 1989)(H_{1b}). Intrinsic motivation highly correlated with identified regulation; while introjected and external regulations were significantly related. As it was expected, it is evident from scale means (Table 5), that participants scored high in autonomous behavioral regulations (intrinsic, identified) and low in non-autonomous motivations (introjected, external) to participate in the training program. All these findings support our initial hypothesis (H_{1b}).

Table 5. Descriptive statistics, CFA correlations, Cronbach's alphas, for the WTMST to participate in training (Study 3; Teachers)

variables	**Mean**	**SD**	**Scale**	**Alphas**	**1**	**2**	**3**	**4**
1. Intrinsic	5.74	1.19	1-7	.81	-	.86***	.09	-.10
2. Identified	5.85	1.14	1-7	.75		-	.19*	.02
3. Introjected	2.44	1.54	1-7	.79			-	.41***
4. External	3.30	1.69	1-7	.79				-

*p< .05; **p<.01; ***p<.001

3.1.2 Qualitative: Time 1

Qualitative analysis of open-ended questions generated two higher order themes corresponding to SDT, namely autonomous, and controlled motivation. Under the theme autonomous motivation two sub-themes were found a) intrinsic motivation, and b) identified regulation. Similarly, under controlled motivation two sub-themes were found a) introjected, and b) external regulation.

Autonomous Motivation

a) *Intrinsic* was the most predominant sub-theme (e.g., 69% of the participants described at least one intrinsic reason). Specifically some representative teachers' quotes are "…I like to learn", "For the sake of knowledge", "For the experience", "Curiosity for new things", "It was a challenge". All these quotes reflect internal reasons for the teachers' decision to participate in the specific training program, corresponding to the highest degree of self-determined behavior. According to SDT definition, engaging in an activity for the inherent pleasure and satisfaction, because it is interesting and challenging, out of curiosity or to explore a new stimulus, represent intrinsic motivation (Deci & Ryan, 1985; Ryan & Deci, 2000a).

b*) Identified* was one of the most frequently presented behavioral regulations in teachers' answers (about 34% of the participants referred to identified reasons). For instance, many teachers reported that they participated in the innovative program because they consider the new subject very useful for their students, the school in general and for themselves. Some teachers wrote very expressively: "I know how much children like it, I think that pupils gain experiential knowledge and they have the motivation to learn, teachers learn along with their students and acquire better relationships with them", "I consider it an interesting case for the students, because they are getting involved in investigative procedures, and this subject departs from the traditional recipe (formula) of instruction/examination etc". These quotes are in accordance with the notion that identified regulation involves the participation in an activity because someone recognizes it as personally important and of great value (Ryan & Deci, 2002). Behaviors originating from identification are considered relatively autonomous because the person adopts them willingly without feelings of pressure or control (Deci & Ryan, 2008).

Controlled Motivation

a) *Introjected* regulation was represented in teachers' responses to a much smaller extent (only 5% of the respondents). Some typical quotes were "Concern over (possible future) demands", "Anxiety about the new curricula", "To understand what the system expects me to teach". As SDT posits when people act under the feelings of pressure, to avoid anxiety or to gain pride, introjection is evident (Ryan & Deci, 2000a).

b) *External* regulation was apparent in a considerable number of responses (about 25% of the participants). According to current reform practices some high school

subjects have been eliminated from the curriculum, or reduced in number of lessons per week (e.g., technology). As a result, many teachers in order to fill their work timetable registered for the training course regarding innovation in order to be able to replace their lost work hours. Accordingly, teachers replied "The reduction of teaching hours of my (specialty) subject in the new curriculum", "Fear of being left without a subject to teach". While some other external reasons were "To obtain the certificate" or "The acquisition of formal qualifications, in times of general insecurity". These answers show that teachers' behaviors sometimes are controlled by external contingencies or demands (Ryan & Deci, 2000a).

Other themes

Some data that did not fit in any of the theory-driven categories shaped new themes. However the percentage of participants who provided these reasons was low: "past experience with projects" (8.2%), "Cooperative/collaborative learning" (3.7%), "to chat/exchange views with colleagues" (2.7%), "frustration with current situation" (1.4%).

3.1.3 Qualitative: Time 2

Similarly to study 1 qualitative analysis of the *T2* interviews generated the same themes.

Autonomous Motivation

Intrinsic motivation: "Because I like innovations in education" (Lola, English teacher, 7 years of teaching experience), "This new endeavor seemed interesting to me" (Bill, PE teacher, 27 years of teaching experience).

Identified: "The main reason is personal development, to be able to respond in the best possible way to teaching this course" (Nick, Technology, 7 years of teaching experience), "My belief is that this subject (research project) is essential for schools" (Jack, Informatics, 16 years of teaching experience), "As a subject, it seems very interesting to me, because the way it is taught is interesting. It puts the student at the center of the cognitive process, not asking him/her to memorize anything...."

Controlled Motivation

Introjected: "Because of my specialty, this subject (research project) is the only lesson I can teach in high school. Thus, I considered my training imperative" (Nick, Technology, 7 years of teaching experience).

External: "The possibility of supplementing working hours" (Jack, Informatics, 16 years of teaching experience), "A basic disadvantage of our specialty (PE teacher) is

occasionally being in a state of limbo regarding the schedule, and it is good to have an extra qualification (weapon) so as to be able to claim more working hours and to avoid being unprotected, having to run here and there" (Bill, PE teacher, 27 years of teaching experience).

All the findings generated from the qualitative data (*T1-T2*) confirmed our first hypothesis (H_1) and showed that SDT can provide the adequate foundation to illuminate teachers' motivation to participate in training promoting educational innovation.

3.2 Prediction of teachers' Intentions

3.2.1 SEM: Time 1- Time 2 (N=71)

In order to examine the effects of teacher autonomous versus controlled motivation regarding their future intentions to participate in relevant training or to teach/implement the new subject, two SEM models were tested. In these models autonomous and controlled motivation latent variables were constructed from the relevant observed variables (i.e., Autonomous= 3 intrinsic + 3 identified observed variables, Controlled= 3 external + 3 introjected observed variables), and likewise intentions latent variables were composed.

During the first analysis it was evident that the model was poor (e.g., for Model 1: TLI=.780, CFI=.821, RMSEA= .130, χ^2=161.18, *df*=74, χ^2/df=2.18) while modification indices inspection indicated that residuals of observed variables corresponding to identified regulation were interrelated and the same was found for external regulation items. Thus, after correlating error terms of identified, and external variables the model fit was improved adequately. In particular, for both models goodness of fit indices suggested better data fit, for Model 1: TLI=.981, CFI=.986, RMSEA= .038, χ^2=74.84, *df*=68, χ^2/df=1.1, and for Model 2: TLI=.940, CFI=.955, RMSEA= .071, χ^2=91.94, *df*=68, χ^2/df=1.35. The theoretical justification for this decision is that correlated errors corresponded to the same construct (e.g., identified regulation). The methodological reason is that items of these subscales (construct) may convey similar meaning/wording (e.g., "because it is important for me to participate in training" and "because I find training important for the academic success of my students"), and ultimately this adjustment does not significantly alter measurement and structural parameters of the model (Bagozzi, 1983; Fornell, 1983).

In the first model (Figure 4) it is evident that only teachers' Autonomous motivation to participate in the training program in *T1* predicted significantly (β=.32, *p*=.009) their intentions to future participate in relevant seminars in *T2*. These findings support our hypothesis H_{2a}.

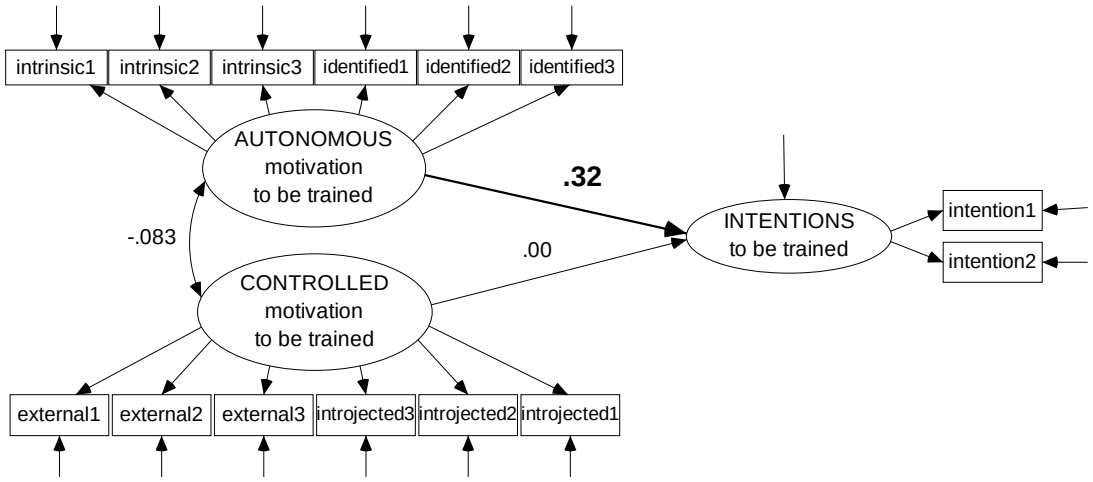

Figure 4 (1). Model 1: Structural model depicting relations between teachers' Autonomous, Controlled motivation and Intentions to participate in training. Number in bold is significant (*p*=.009)(Study 3).

Likewise, in the second model (Figure 5) only Autonomous motivation in teaching the new subject during the second phase (*T2*) measurement, contributed significantly (β=.72, *p*<.001) in the explanation of variance of intentions to teach this subject in the future (*T2*). Again our findings confirmed our hypothesis H_{2b}.

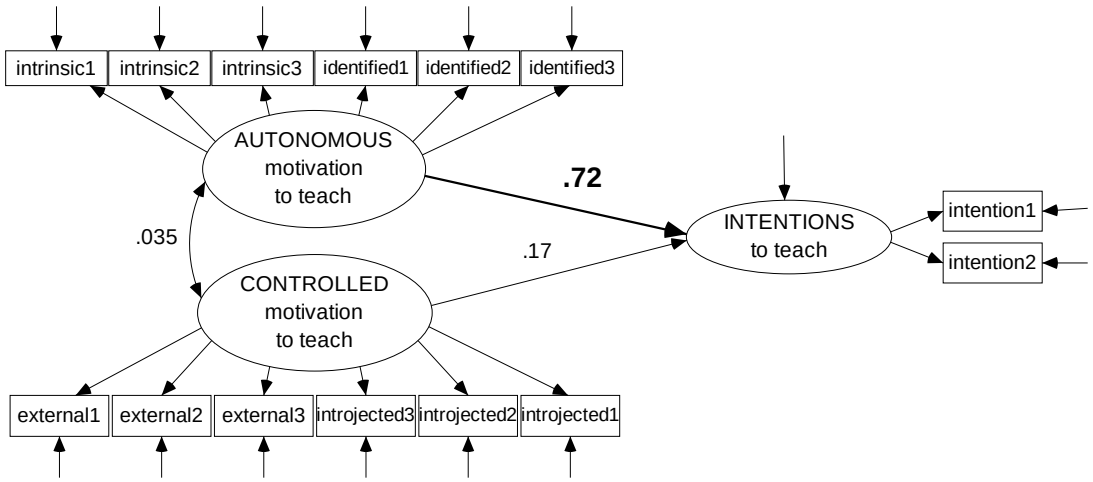

Figure 5 (2). Model 2: Structural model depicting relations between teachers' Autonomous, Controlled motivation and Intentions to teach the innovative subject. Number in bold is significant (*p*<.001)(Study 3).

Our analyses comply with recommendations that when sample size is small, it may be appropriate to increase indicators per factor ratio, so in our models we constructed two latent variables with six indicators each (Boomsma & Hoogland, 2001; Marsh & Hau, 1999; Marsh, Hau, Balla, & Grayson, 1998). However, to further address the limitation of our small sample size (n=71) and to verify our SEM findings, we conducted the same analyses using parceling techniques, in order to reduce the number of parameters to be estimated to a more optimal level (see Little, Cunningham, Shahar, & Widaman, 2002). Following recommendations by Kishton and Widaman (1994), and Little, et.al., (2002), we tested both structural models with three *domain representative parcels* for each motivational factor (i.e., autonomous, controlled). In this approach each parcel represents a large domain (e.g., autonomous motivation) which is formulated by various sub-domains (e.g., intrinsic, identified regulation) (Kishton & Widaman, 1994). Following Little et al., (2002) in order to optimally represent the latent variables-factors, we constructed three parcels per factor. Each parcel comprised of two items, one from each regulation (e.g., intrinsic item 1+ identified item 1) to represent all the facets of the latent factor (e.g., autonomous motivation). Results of these analyses produced the same pattern and magnitude of relationships (i.e., autonomous motivation predicted intentions to participate in training β=.33, p= .008, and intentions to teach the new subject β=.68, p<.001, whereas controlled motivation did not have any significant effect on intentions), but with an even better model fit (i.e., Model 1: TLI = 1.02, CFI= 1.00, RMSEA= 0.00, χ^2= 12.37, df= 17, χ^2/df=.73; Model 2: TLI = 0.974, CFI= 0.984, RMSEA= 0.66, χ^2= 22.19, df= 17, χ^2/df= 1.3).

4. Discussion

4.1 General discussion

The findings of the present research regarding the positive effects of autonomous motivation on intentions were in line with theoretical predictions. Research hypotheses for teacher situational motivation were confirmed in the environment of Greek secondary education, where teachers voluntarily chose to pursue clear, specific, meaningful and challenging work tasks. Different kinds of data -quantitative and qualitative- complemented each other by providing a rich account of the situation and triangulating teacher responses (Patton, 1990). These findings are in agreement with existing findings indicating that teacher autonomous motivation is connected with

positive outcomes such as job satisfaction (Christodoulidis, 2004), lower teacher burnout (Fernet et al., 2008), an increased sense of personal accomplishments and reduced emotional exhaustion (Fernet, Guay, Senécal, & Austin, 2012; Roth et al., 2007), stronger attitudes of persistence in educational innovation (Lam et al., 2010), students' autonomous motivation to learn (Roth et al., 2007) and more frequent use of student-centered teaching styles (Hein et al., 2012).

Qualitative analysis suggested that not only was every behavioral regulation from SDT continuum present in the data, but also in the respective volume similar to the quantitative findings. Although both intrinsic and extrinsic reasons for participation in training exist in teachers' minds, the most predominant are the most internalized forms of behavioral regulations (i.e., intrinsic, identified), corresponding to autonomous motivation. While from the qualitative data it is evident that external reasons may play an important role in teachers' decisions; quantitative analyses showed that these reasons have a controlling effect, which does not contribute to sustain prolonged involvement with this kind of professional learning. Accordingly, it seems that motivation to teach is mostly dependent on autonomous internal causes, because as was expected, only autonomous motivation would have a significant impact on teacher intentions to future implement the innovative subject.

For these Greek teachers, participation in training led to the acquisition of certification, which is a tangible external reward (e.g., qualification for their CV), whereas teaching the new subject did not relate to any external tangible reward. On the contrary, it was accompanied by a greater workload for preparation, which was acceptable to autonomously motivated teachers but not to controlled motivated teachers. This is especially true for educational systems with low or no accountability for teaching, which was still the case in Greece when this study was conducted. However, even if teacher evaluation is used to promote the implementation of the new subject, the present results indicate that this kind of motivation would be controlling with superficial and temporary results. Our findings are important not only for educational systems where continuous professional development is optional (e.g., Greece, Denmark, Ireland, Iceland or Norway; European Commission/EACEA/ Eurydice, 2013, pp. 57-58), but also for countries where external incentives are used to encourage participation in training (e.g., Spain, Bulgaria, Lithuania, Portugal, Romania, Slovenia, Slovakia; European Commission/EACEA/Eurydice, 2013, pp. 57-58). Even when controlled motivation occurs, such as for some of the participants of

the present study, only autonomous motivation leads to teachers' optimal engagement with professional training and school innovations. Thus, policy makers, regardless of their educational system, need to target the promotion and support of the autonomous motivation of teachers by creating the appropriate conditions in their educational environments.

In line with the matching hypothesis, the present findings show that different situations involving innovation have been very appealing to autonomous motivated individuals. However, the presence of innovation per se would have not been enough to understand what triggered teachers' goals and behaviors to participate in training and implement an innovative subject if we had not examined the reasons for teachers' involvement in these situations. Innovation was appealing for controlled motivated individuals too, but insofar as external reasons for involvement were present. Investigating individuals' reasons for involvement in situations raising curiosity is important to understand what triggers both choice and persistence. Importantly though, these reasons should be meaningful to participants and need to be examined in authentic settings. Methodological designs of laboratory studies testing dispositions in situations which are manipulated to raise curiosity and to trigger intrinsic motivation, choice and persistence might be misleading because they can hardly convey authentic reasons for participation in these experimental settings.

4.2 Implications

Our study shows that if teachers are autonomously motivated towards training, they will be more determined to participate in such training during the following year, and the same rule applies in regards to the teaching of an innovative subject. According to TPB (Ajen, 2002) higher intentions are very likely to lead to the expression of a behavior, here, the implementation of the new subject and the participation to subsequent relevant training. This prolonged engagement in turn may lead to the successful adoption of the innovation. As Bitan-Friedlander, Dreyfus, and Milgrom, (2004) found, the adoption of the innovation was successful only for teachers in their second year of in-service training. This shows that sometimes more training time is necessary for a new teaching practice to be adopted and implemented appropriately. In addition, Yoon et al. (2007) reported that professional development exceeding 14 h has a positive and significant effect on students, while below this threshold no impact is evident. More importantly, they revealed that teacher training for about 49 h can result in 21% increase in student achievement (Yoon et al., 2007). These findings, in

conjunction with ours, imply that if teachers are more autonomously motivated to participate in training for this innovative subject, they might engage in this kind of professional development programs for the appropriate amount of time, which can produce positive impact to their students and the successful adoption of the innovation.

Self-determination theorists suggest that work environments promoting employee need for autonomy, competence and relatedness can increase their intrinsic motivation, and the full internalization of external motivators, leading to greater persistence, productivity, job satisfaction, positive work attitudes, organizational commitment and psychological well-being (Gagne´ & Deci, 2005). Accordingly, three basic supportive dimensions of school environments namely competence, autonomy and collegial support have been found to predict teacher motivation towards innovative teaching (Lam et al., 2010). Moreover, the basic needs for autonomy, competence and relatedness may significantly influence teachers' self-determined motivation but not controlled motivation regarding school innovations (Schellenbach-Zell & Gräsel, 2010).

Consequently, if policy makers and government officials aim to improve teacher participation in training, and implementation relative to educational innovations, they need to target teachers' basic needs satisfaction. Specifically, they must provide environments and conditions supportive of teacher autonomy, competence and relatedness needs, in order to foster their autonomous motivation across the tasks they have to carry out. We know from teacher professional development literature that teachers must have the right of choice to shape their training according to their needs, without restricting their personal time, while at the same time being able to be involved in the formulation of current reforms (Armour & Yelling, 2004; O'Sullivan & Deglau, 2006). This means that teachers need to have the freedom to customize their training and to participate in individualized programs. These suggestions will lead to the satisfaction of teachers' need for autonomy regarding their training.

Teachers' need for competence can be satisfied through vicarious experiences, by watching innovative teaching models (Deglau & O'Sullivan, 2006), by their prior mastery experiences (Kulinna, McCaughtry, Martin, Cothran, & Faust, 2008) and by verbal persuasion in the form of feedback, encouragement and guidance (Martin, McCaughtry, & Kulinna, 2008; Martin, McCaughtry, Kulinna, & Cothran, 2009).

Thus, the first step for teachers is to be participant observers in others' *Research Projects*; the second step is to pilot their own *Research Projects*; and the third step is to be monitored by experts and given frequent feedback.

Finally, in-service training that promotes cooperative professional learning opportunities may satisfy teachers' relatedness need. A growing body of research in education favors teacher training in collaborative learning environments because it produces multiple benefits (Borko, 2004; Butler & Schnellert, 2012; Cochran-Smith & Lytle, 1999; Lieberman & Pointer Mace, 2008; Putnam & Borko, 2000). This means that teachers engaging in *Research Projects* should compose and participate in collaborative networks throughout their training and during the implementation of this innovative subject.

The present findings also underline the necessity to investigate motivational hypotheses in real life situations where competence improvement and achievement have authentic meaning to participants. To understand the motivational determinants and consequences of dispositions such as *will to learn* (e.g., Van Eekelen et al., 2006) or *will to implement* (e.g., Abrami et al., 2004), it is important to examine the same individuals across different situations providing similar meaning for achievement (Mischel & Shoda, 1998). However, meaning is determined by the participants not by the experimenters. Participants find a task meaningful based on their past histories and life purposes (Nicholls, Pataschnick & Nolen, 1985; Kasser & Ryan, 1996) and therefore, task meaningfulness can be hardly authentic in laboratory environments. Authentic meaning that can trigger participants' goals to learn and achieve and experience intrinsic motivation can be found in real situations.

4.4 Limitations

In the present study we examined teachers' situational motivation and its predictions of their future intentions. It would be more interesting to examine the impact of motivation on teachers' actual behavior, but such an investigation in real life settings would have many methodological barriers to overcome. Thus, we chose to measure teacher intentions as a manifestation of their future behavior because there is solid evidence associating intentions with behaviors (Ajzen, 1991). Furthermore, because we focused on quality of teachers' motivation in specific work tasks, we did not examine their quantity of motivation (e.g., amotivation), nor the quality or quantity of teachers' motivation in mandatory situations (e.g., motivation in countries where

training is compulsory), which are some other very interesting facets of this line of research.

In the current research, even though both types of data (quantitative and qualitative) were utilized to provide a better understanding of teachers' intentional behaviors, open-ended questions and written interviews were used instead of more intense forms of qualitative methodologies (e.g., in-depth face to face interviews). Nevertheless, Patton (1990, p. 24) illustrated that although written responses to open-ended questions are the most basic and simple (*elementary*) form of qualitative data, they do provide more information (*depth, detail*) and clarity to quantitative questionnaire responses.

The relatively low number of responses especially in *T2* may limit the generalizability of SEM findings. Yet, even though we should be cautious in the interpretation of the findings due to small sample size; triangulation process and the rigorous analyses of quantitative and qualitative data provide us with relative confidence about the truth of our arguments.

Another limitation may be the low level of response rate (21.6%). However, recent studies addressing the subject of response rates in web-based surveys by teachers suggest that a low level response rate of less than 22% might be expected when a web based questionnaire is administered to teachers (Mertler, 2003; Shih & Fan 2008). Moreover, participants were volunteers in their engagement with the innovation, which may incorporate some bias in their responses (e.g., they may already be the more autonomously motivated and positively predisposed teachers towards innovation).

A final point about our sample is that half of the participants held a postgraduate degree when the proportion of this qualification among Greek High School teacher population was only about 9% (Educational Research Center, 2007). If we consider this characteristic as an indication of teacher quality, then we agree with the notion of Guskey (1988) that when participation in instructional innovations is voluntary, teachers who decide to engage, at least initially, may already be high quality instructors.

4.5 Conclusion

The present research confirms that SDT can provide the theoretical foundation for understanding teachers' decisions to learn about and implement innovations. Although many studies have been conducted to understand teachers' work related

motivation (e.g., Skaalvik & Skaalvik, 2011; Thoonen, Sleegers, Oort, Peetsma, & Geijsel, 2011) to our knowledge there are no similar studies applying the SDT framework to this situation specific motivation of teachers. This study provides solid evidence that SDT suggestions must be taken into account when designing in-service training programs to implement innovations in education. Recent publications reported that there is not an adequate motivational theory to investigate teachers' cognitions, and proposed an integrated model with constructs from multiple theories (Cave & Mulloy, 2010; Jesus & Lens, 2005). Although this approach has many advantages (e.g., external validity), it could be very complicated and difficult to study. On the other hand, SDT provides a much simpler, but more comprehensive platform to investigate teachers' intentional behaviors, and proposes specific strategies to enhance teachers' motivation to the most optimal level. While three decades of SDT research have shown that this theory is valuable for the examination of student learning, our results support its usefulness in the area of teacher learning as well. However, further international research is needed in order to provide intercultural evidence of SDT application in teacher in-service professional learning across different educational settings.

Bearing in mind that teachers' engagement in professional development programs in many countries (e.g., Greece, Ireland, Denmark, Norway, Sweden, Netherlands; European Commission/EACEA/Eurydice, 2013) is not mandatory, and in-service training participation might be optional, it becomes extremely important to investigate their intentional motivation to become life-long learners and to pursue their professional learning. This is especially true, when educational contexts are affected by economic depression, which leads to salary reduction, and there is an absence of monetary incentives for participation in retraining. Such an environment might become a deterrent for teachers' voluntary involvement in further training, but maybe not for those teachers who are highly autonomously motivated. This line of research merits further attention in future studies of teacher professional development and school innovation, and a substantial theory to guide practice regarding teacher professional growth seems to be SDT.

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5.2 Teachers' Achievement Goals (Quantitative/ Publication 5)

Teachers' achievement goals and self-determination to engage in work tasks promoting educational innovations[10]

Abstract

Teachers' motivation determines the adoption and effective implementation of school innovations. The main objective of this research was the investigation of the patterns of relationships between teachers' achievement goals and their self-determined motivation to get involved with work tasks promoting innovations (i.e., participation in training, implementation of new practices). Participants were (a) 276 teachers who were involved in training about innovations, divided into two groups according to the condition of their recruitment (i.e., optional, *n* =191 vs. mandatory, *n* =85; Study 1); and (b) 140 teachers who implemented educational innovation at school (Study 2).

Teachers' achievement goals, self-determination and intentions were responded to questionnaires with good psychometric properties. Hypotheses were tested using structural equation modeling. Analyses in Study 1 revealed that only mastery goal was positively linked with teachers' autonomous motivation, while performance avoidance goal was positively linked with their controlled motivation to participate in training and these patterns were invariant across teacher groups-conditions. Study 2 showed that mastery goal orientation had an indirect effect on intentions to implement innovation, and this relationship was fully mediated by autonomous motivation to teach innovation. None of the performance goals was linked with intention, and only performance approach goal was positively linked with controlled motivation to implement innovation. These findings suggest that teachers' mastery goals and autonomous motivation should be promoted in order to foster teachers' optimal engagement with educational innovations.

Keywords: Mastery goal orientation, performance goal orientations, autonomous motivation, controlled motivation, teaching innovation

[10] **Submitted (revised) for publication in 2015 (Publication 5)**

Highlights

- Teachers' mastery goal was related to autonomous participation in training
- Teachers' performance avoidance goal was related to controlled motivation
- The above patterns of relationships were invariant across teacher groups/conditions
- Mastery goal relationship with intentions was mediated by autonomous motivation
- Performance goals did not relate to intentions to implement innovation

1. Introduction

It is widely acknowledged that quality of motivation drives human behavior and is essential for optimal functioning and well-being (Deci & Ryan, 2002). Teacher motivation is an integral part of their work-related behavior and influences student achievement (Richardson & Watt, 2010). In educational research, while the quality of student motivation has been thoroughly examined (see Guay, Ratelle, & Chanal, 2008; Midgley et al., 1998; Ryan & Deci, 2009), only in the last decade research addressing not only quantity but also quality of teacher motivation has gained momentum (e.g., Butler, 2007; Papaioannou & Christodoulidis, 2007; Roth, Assor, Kanat-Maymon, & Kaplan, 2007). Although this line of inquiry is in rapid growth, authors point out the need for more systematic theory-driven research (Richardson & Watt, 2010). There are also suggestions that research should go beyond the global measurements of teacher work motivation and target situation specific motivation, because there is evidence that teacher motivational qualities may vary depending on the work task in hand (Fernet, Senecal, Guay, Marsh, & Dowson, 2008) or across occasions (Praetorius et al., 2014). A teacher who is optimally motivated towards teaching with traditional methods, may be less motivated towards other tasks such as in-service training, or innovative instruction. Thus, attempting to understand teachers' motivational functioning in a variety of situations and contexts is of great significance because different patterns of behavior and outcomes have been attributed to different motivational qualities of teachers (e.g. Malmberg, 2008; Retelsdorf, Butler, Streblow, & Schiefele, 2010).

Powerful motivational qualities of teachers, which have been suggested to guide their thought and behavior, are their tendencies towards specific achievement goals (Ames & Ames, 1984; Butler & Shibaz, 2008; Papaioannou & Christodoulidis, 2007). The significance of teachers' goals for educational practice lies in the assumption that distinct personal goals create different motivational systems and processes that regulate individual cognition, affect and behavior (Ames & Ames, 1984; Dweck & Leggett, 1988; Elliot, 1999). This assumption has been extensively tested in education showing that different goal adoption leads to either adaptive or maladaptive processes and outcomes such as persistence or withdrawal in the face of failure, effective or superficial use of educational material and learning strategies, higher or lower levels of performance, increased or decreased intrinsic motivation (for reviews see Elliot, 2005; Kaplan & Maehr, 2007; Maehr & Zusho, 2009). The consistency of these findings in educational settings suggests that teachers' intentional behavior at work and the whole teaching-learning process will be affected by teacher's personal goals. Indeed, teachers' goal pursuits (i.e., orientations) have been connected to diverse outcomes such as interest in teaching, burnout, help seeking attitudes and behaviors, the selection and use of specific teaching practices that influence students' engagement (i.e., help seeking, interest and enjoyment) (Butler & Shibaz, 2008, 2014; Retelsdorf et al., 2010).

An important aspiration and general request for excellence in education is instructional innovation. The significance of innovative teaching in current worldwide reforms is indisputable, and it appears that teachers' motivation quality is one of the most instrumental factors for the successful adoption and implementation of innovative syllabus (Abrami, Poulsen, & Chambers, 2004; Cave & Mulloy, 2010; Gorozidis & Papaioannou, 2011; Lam, Cheng, & Choy, 2010; Schellenbach-Zell & Gräsel, 2010).

Research over the last thirty years suggests that attempting to modify teaching habits and implement innovative practices requires extra work, time and effort, and it might raise anxiety and fear of failure (Guskey, 1986, 2002). This might discourage many teachers from getting involved with educational innovations when the participation is optional; whereas when innovation is mandated, teachers' long term and deep engagement might be hampered. But, to appropriately implement educational innovations, continuation and support is crucial for teachers to improve and to start applying new practices regularly (Guskey, 1986, 2002). In this context the

examination of teacher motivational qualities that determine their participation and intention to carry on with educational innovations, seems very important.

While the top-down model of introducing educational innovations has been criticized as ineffective (e.g., Fullan, 2009), it is still in use in many educational systems worldwide, such as in Greece. The basic means to introduce and disseminate educational innovations are teacher in-service training programs provided by authorities. However, policy makers and reform designers when attempting to introduce educational innovations do not seem to take into account theoretical and empirical suggestions (e.g., Deci & Ryan, 2012) on how to cultivate teacher optimal motivation in order to promote profound engagement with these efforts. For example, educational policies of most European countries (see European Commission/EACEA/ Eurydice, 2013, pp 60-61) employ teachers' inducements (e.g., extra payment, job promotion) or compulsory participation to promote teachers' professional training. However, teachers may experience this kind of external incentives and pressures as controlling, which in turn may have undermining effects on their intrinsic motivation and interest (Deci, Koestner, & Ryan, 1999; Pelletier, Séguin-Lévesque, & Legault, 2002). In addition, while in some countries teaching content and methods are influenced by teachers, in the majority of European systems educational authorities have the deciding power over instructional content. In Greece, where this study was conducted, policy makers take almost every decision on curriculum content and teaching methods (see European Commission/EACEA/ Eurydice, 2013, pp 103-105). A controlling environment for school teachers exist also in other countries implementing high-stakes testing policies (for reviews see Ryan & Brown, 2005; Ryan & Weinstein, 2009).

Theory and practice consistently suggest that autonomous and not controlled motivation is the most beneficial type of motivation for educational practice and for teachers' and students' optimal engagement and well-being (Deci & Ryan, 2012). However, the aforementioned policies in education do not reflect the appropriate learning environments (see Deci & Ryan, 2000; Nicholls, 1989) for the promotion of teachers' high-quality motivation and for deep engagement and continuation of innovations. It seems that mostly external incentives and pressures are used to motivate them, but these features are not considered the most sufficient for qualitative educational results (Deci & Ryan, 2008; Ryan & Deci, 2000). Indeed, theory development and research in education and other domains have shown that autonomy

support is vital and that controlling environments and motivational strategies, thwarting peoples' autonomy lead to unintended outcomes, such as superficial learning, impaired intrinsic motivation, lower persistence and creativity (Deci, Koestner, & Ryan, 2001; Deci & Ryan, 2008; Ryan & La Guardia, 1999; Ryan & Weinstein, 2009), thus undermining effective teacher engagement with innovative educational practices. Under these circumstances, the examination of the determinants of person autonomous motivation in terms of individual dispositions (i.e., achievement goals), dispositions that will help them overcome any environmental barriers, becomes very significant. It is anticipated that this kind of investigation may provide useful evidence for the prediction of teachers' qualitative engagement with innovative practices.

Explaining the motivational processes underlying teacher's intentional behavior during educational innovations has the potential to give insights on how to succeed in attracting teachers to get deeply involved with innovations and to establish their prolonged engagement. To this pathway two robust motivational frameworks sharing an intentional perspective and an emphasis on motivation quality seemed the most adequate to guide our work, that is achievement goals theory (AGT; Ames & Archer, 1988; Dweck, 1986; Nicholls, 1984) and self-determination theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000). These theories deal with the explanation of the qualitative diversity in motivational patterns and outcomes as a result of different motivational orientations and regulations (e.g., mastery vs. performance, autonomous vs. controlled), and have been successfully applied in various situations and life domains (Papaioannou, Zourbanos, Krommidas, & Ampatzoglou, 2012; Payne, Youngcourt, & Beaubien, 2007; Ryan & Deci, 2002).

By integrating these theories one can address the same problem from different perspectives, gaining a better understanding and establishing the validity of the findings. Briefly, while both theories deal with the person-environment interaction which produces qualitative differences in personal conduct, AGT focuses on individual differences-dispositions (i.e., goal orientations), whereas SDT emphasizes organismic needs fulfillment. Moreover, while both theories underscore the importance of competence beliefs for individual strivings, only AGT addresses how different conceptions of personal competence impact cognition, affect and behavior. On the other hand, in SDT competence is a universal human need which should be satisfied in order to foster optimal motivation. SDT also emphasizes autonomy and

relatedness needs fulfillment, which are not in the central focus of AGT. Differences and commonalities of AGT and SDT have lead to suggestions for complementary use when attempting to fully understand human cognition and behavior (Butler, 1989; Ryan & Deci, 1989). Thus, in the present article an attempt toward synthesis was made by studying the relationships between motivational constructs of AGT and SDT, (i.e., teachers' achievement goals and motivational regulations) in order to decode teacher psychological functioning during the practice of educational innovation and to suggest solutions for the successful qualitative enrollment with these practices.

1.1. Achievement Goals Theory

The basic tenet of this theory is that individuals' strivings in achievement situations depend on their judgments of personal competence (Dweck & Leggett, 1988; Nicholls, 1989). Under this framework several important approaches have been proposed with the most prevalent the three models described below. In the original dichotomous model, people pursue either a mastery-learning goal (i.e., their aim is to learn and to improve personal competence, while evaluation of success is self-referenced), or a performance goal (i.e., they strive to demonstrate superior ability, while evaluation criteria are normative) (Nicholls, 1989). In a modification of this theory Elliot and Church (1997) proposed a trichotomous model, in which the performance goal was split into approach (i.e., to outperform others) and avoidance (i.e., to avoid looking incompetent compared to others). In the 2x2 model, both performance and mastery goals were divided in approach (i.e., to develop task-mastery) and avoidance (i.e., to avoid lose intrapersonal abilities and skills) (Elliot & McGregor, 2001). However, because mastery-avoidance goal is an ambiguous and comparatively new construct which is not universally accepted (Ciani & Sheldon, 2010; Maehr & Zusho, 2009), in the present study we decided to focus on the three goals (trichotomous model: mastery, performance approach and performance avoidance) which have been mostly examined. Thus, literature review and further discussion will be centered on the goals proposed by the trichotomous model (Elliot & Church, 1997; Elliot & Harackiewicz, 1996).

Achievement goals researchers posit that individuals have predispositions towards specific goals (i.e., goal orientations) which are considered as dynamic, relatively stable, task specific self-related cognitions (Roberts, Treasure, & Conroy, 2007). A significant notion of the theory, which has been supported by empirical

evidence, is that mastery and performance goal orientations are orthogonal (Duda & White, 1992; Nicholls, 1989; Roberts, Treasure, & Kavussanu, 1996). In similar vein, performance approach and performance avoidance goals have been suggested to be independent goal strivings producing different patterns of behavior and consequences (Elliot, 1999, 2005).

Research findings are generally congruent regarding mastery goals which have been connected with positive outcomes and behaviors, whereas performance avoidance goals have been associated with negative ones. However, findings regarding performance approach goals are more complex. While many researchers posit that performance approach goals lead mostly to maladaptive patterns of responses (Dweck, 1986; Midgley, Kaplan, & Middleton, 2001; Nicholls, 1984), there is evidence that in some cases these goals may be adaptive (Elliot & Church, 1997; Elliot & Harackiewicz, 1996). Harackiewicz, Barron, Pintrich, Elliot, and Thrash (2002) suggested that mastery and performance approach goals have positive independent effects on different achievement outcomes and concluded that both goals can be adaptive for college education. Indeed, in relevant literature reviews it has been suggested that performance approach goals can be connected to positive outcomes and processes under specific circumstances (Elliot & Moller, 2003; Moller & Elliot, 2006). More specifically, some scholars posited that performance approach goals, when normatively defined, are frequently correlated with some desirable outcomes such as effort, but most notably with students' graded performance (Hulleman, Schrager, Bodmann, & Harackiewicz, 2010; Senko, Hulleman, & Harackiewicz, 2011).

However, in the case of teachers' participation in training and continuous involvement with innovations this proposition may not be relevant. The reason is that in order one to get involved with educational innovation, qualities such as intrinsic interest, deep understanding and learning of the innovation, persistence in the face of failure/obstacles, seem more important than (graded or exam) performance which have been the most consistently related positive outcome of performance approach goals (Hulleman et al., 2010; Senko et al., 2011). Thus, while the relationships of mastery and performance avoidance goals with teacher motivation may be expected, it seems very interesting to explore the way teacher performance approach goals connect to motivational regulations, especially in a performance structured educational environment as described above.

1.2. Teachers' achievement goals

Although research on teachers' goals is limited there are recent findings confirming the usefulness, applicability and transferability of AGT relevant hypotheses to the teacher-work domain. Specifically, teacher mastery goal orientation has been connected positively to reflection, feedback and help seeking behaviors, self-efficacy, high quality instruction (e.g., cognitive stimulation), classroom mastery goal structure, individual reference norm utilization, perceived teacher support and low levels of inhibition, students' interest in class, the adoption and implementation of a reform (Butler, 2007; Butler & Shibaz, 2008, 2014; Cho & Shim, 2013; Gorozidis & Papaioannou, 2011; Retelsdorf, Butler, Streblow, & Schiefele, 2010; Retelsdorf & Günther, 2011; Runhaar, Sanders, & Yang, 2010). Moreover, teachers' mastery orientation has been consistently found to correspond to high levels of job satisfaction, engagement, interest in teaching, training participation, greater use of adaptive coping strategies towards work threats and/or challenges, and low levels of burnout and occupational strain (Nitsche, Dickhäuser, Fasching, & Dresel, 2013; Papaioannou & Christodoulidis, 2007; Parker, Martin, Colmar, & Liem, 2012; Retelsdorf et al., 2010; Skaalvik & Skaalvik, 2013). All these findings support the assumption that for mastery oriented teachers, it will be much more likely to perceive educational innovations as interesting challenges to be mastered, by pursuing participation in training and continuous involvement with innovative instruction in order to improve their implementation competency.

On the other hand, findings regarding teacher performance avoidance orientation present mostly maladaptive patterns of relations with work related cognitions and instructional behaviors (Butler, 2007; Papaioannou & Christodoulidis, 2007; Parker et al., 2012; Retelsdorf et al., 2010; Retelsdorf & Günther, 2011; Skaalvik & Skaalvik, 2013). These findings are in accordance with the broad AGT literature and imply that performance avoidance oriented teachers would be more inclined to consider educational innovations and the implementation of new instructional practices as work threats to be avoided, because these situations conceal a threat for their competencies, the risk of being negatively evaluated (informally or formally) by students, colleagues and/or administrators. As a result, they may decide to participate in training promoting innovative instruction out of feelings of pressure,

while they might not have the intention to implement innovations at school and they would try to avoid it.

Associations and effects of teacher performance approach goals have been found to be less consistent, with either negative (e.g., Hoffmann, Huff, Patterson, & Nietfeld, 2009; Retelsdorf et al., 2010; Retelsdorf & Günther,2011), positive (e.g., Gorozidis & Papaioannou, 2011; Skaalvik & Skaalvik, 2013) or no significant (e.g., Butler & Shibaz, 2008; 2014; Papaioannou & Christodoulidis, 2007) relations with motivational processes and instructional practices. These inconsistent findings imply that performance oriented teachers may be more susceptible to the relative characteristics of each situation/task and context they engage in. Thus, it is possible that because normative comparison is absent during in-service training, this work-task will not be very appealing to them. On the other hand, because when implementing innovation teacher's competence is constantly evaluated by students, colleagues and/or administrators, this task may be considered as an opportunity, for performance oriented individuals (especially to those with high perceived competence), to demonstrate personal teaching abilities which may prompt their subsequent involvement with innovation. However, in cases where no accountability system is available and teachers cannot prove their competence in comparison to their colleagues officially, the opposite could also be true, especially for those who do not consider informal evaluation (by students, colleagues etc) so important.

In general, results about teachers are congruent with empirical findings in work (e.g., VandeWalle, Cron, & Slocum, 2001) and education domains (e.g., Papaioannou, Simou, Kosmidou, Milosis, & Tsigilis, 2009), however research hypotheses relative to teacher situation and task specific goal orientations, regarding their engagement with educational innovations are yet to be examined.

1.3. Self-determination theory (SDT)

Another prominent theory for the examination of motivation at the situational level is SDT (Deci & Ryan, 1985; Vallerand, 1997). A fundamental focus of SDT is the reasons behind individuals' decision to engage in an activity; and one of its greatest contributions in understanding human functioning, is the distinction between autonomous (or self-determined) and controlled types of behavioral regulations guiding peoples' conduct (Deci & Ryan, 2000). Within self-determination continuum of human motivation (Ryan & Deci, 2009, p. 177) the basic types of autonomous

motivation are *intrinsic* (i.e., doing something because it is interesting and enjoyable) and *identified* (i.e., because it is personally important and valuable) regulation, while *introjected* (i.e., to feel worthy or to avoid feelings of guilt and shame) and *external* (i.e., to gain material incentives, recognition or to avoid punishments) regulations are considered controlled types of motivation (Ryan & Deci, 2000). Numerous studies in a variety of settings consistently show that autonomous in contrast to controlled motivation is connected to adaptive patterns and outcomes, optimal engagement and well-being (Deci & Ryan, 2000).

1.4. Teachers' self-determined motivation

Recent findings in educational settings support the relevance of SDT framework regarding teacher motivation. For instance, studies in different countries and educational levels show that teacher autonomous but not controlled motivation is positively associated with personal accomplishment and job control and negatively associated with emotional exhaustion, depersonalization and job demands (Fernet, Guay, & Senécal, 2004; Fernet, Guay, Senécal, & Austin, 2012; Fernet et al., 2008; Roth et al., 2007). In a similar vein, teacher self-determined motivations (i.e., intrinsic, identified) have been related to positive attitudes and intentions towards innovative teaching and student-centered instruction, greater use of motivational strategies and student engagement, higher teaching efficacy and participation in training (Demir, 2011; Fernet et al., 2012; Gorozidis & Papaioannou, 2014; Hein et al., 2012; Lam et al., 2010; Taylor, Ntoumanis, & Standage, 2008). All these findings align with the notion that teachers' autonomous motivation in every work task they carry out should be present for high quality educational achievements as well as the effective implementation of innovations. In other words, teachers are expected to be optimally engaged with innovations (e.g., to participate in relevant training and to have positive intentions to implement it in the future) when they are autonomously rather than controlled motivated.

1.5. AGT-SDT integration

According to AGT and SDT theorizing (Deci & Ryan, 2000; Dweck, 1986; Nichols, 1984) there are conceptual similarities between mastery-learning goals with autonomous motivation, meaning that a mastery oriented teacher would be more autonomously motivated to pursue participation in training and learning; and

performance goals with controlled motivation, implying that performance oriented teachers would exhibit controlled types of motivation in their pursuit of in-service training opportunities.

Mastery oriented individuals engage in an activity for its own sake, in order to learn and master the task in hand, to promote their personal competence; as a result they see challenges as opportunities for improvement and failures as valuable lessons to be learned (Dweck, 1986; Nicholls, 1984; 1989). Because task involvement is self-referenced and an increase in mastery is an end in itself, when individuals feel mastering a task, they experience success and higher levels of intrinsic motivation (Nicholls, 1984). In contrast, performance oriented individuals engage in an activity as a means to an end, to gain favorable judgments for their competence or to avoid negative evaluations for their ability and make judgments about success based on normative criteria (Dweck & Elliott, 1983; Nicholls, 1984; 1989). Their task engagement is dependent mainly on normative criteria or social evaluations (i.e., others' ability) of personal competence, which set the basis for external motivation. Indeed, empirical findings generally support these assumptions.

Several studies involving mainly students and athletes, examined the links and impacts of dispositional goal orientations on behavioral regulations. As follows, mastery goal orientation has been positively associated with the most self-determined types of motivation (e.g., Brunel, 1999; Elliot & McGregor, 2001; Nien & Duda, 2008; Papaioannou et al., 2009; Smith, Duda, Allen, & Hall, 2002; Standage & Treasure, 2002) and in several cases it was found to predict intrinsic motivation and identified regulation (e.g., Barkoukis, Ntoumanis, & Nikitaras, 2007; Bell & Kozlowski, 2008; Ntoumanis, 2001; Van Yperen, 2006). On the other hand, performance avoidance orientation has been reported to be connected with the lowest levels of self-determined motivation (e.g., Barkoukis et al., 2007; Smith et al., 2002; Van Yperen, 2006) and low intrinsic motivation (Bell & Kozlowski, 2008; Elliot & Church, 1997; Elliot & Harackiewicz, 1996; Elliot & McGregor, 2001). Findings regarding performance approach goal orientation revealed mostly positive relations with low self-determination and prediction of extrinsic motivation (e.g., Barkoukis et al., 2007; Nien & Duda, 2008; Papaioannou et al., 2009; Smith et al., 2002), while in some cases null or low positive relationships with self-determined motivation emerged (Bell & Kozlowski, 2008; Elliot & McGregor, 2001; Smith et al., 2002; Van Yperen, 2006).

With regard to teachers, to our knowledge, research examining these relationships is scarce. Two relevant studies conducted in Finland (Malmberg, 2006, 2008) with student teachers and applicant teachers. In the first study it was found that mastery goal was positively linked with intrinsic motivation, performance avoidance related with extrinsic motivation, while performance approach had insignificant (student teachers) or positive (applicants) associations with extrinsic motivation for teaching (Malmberg, 2006). In the second study, Malmberg (2008) found that only mastery goal orientation predicted student teachers' intrinsic motivation to teach. In the Greek context, Christodoulidis (2004) carried out a study with in-service teachers and reported that only mastery goal orientation was positively connected with intrinsic and identified and negatively with external regulation for teaching; performance avoidance was positively related with introjected and external regulation and performance approach was significantly associated only with introjected regulation.

In similar fashion, in work domain Dysvik and Kuvaas (2010, 2013) reported that intrinsic motivation had a positive association with mastery goals, a negative relationship with performance avoidance goals, and a low positive relationship or not significant association with performance approach goals; whereas both performance goals presented positive significant relationships with extrinsic motivation.

Recent meta-analytic findings are along those lines. In a meta-analysis of 243 correlational studies Hulleman et al. (2010) found that interest had a strong positive relation with mastery goals, a very small positive relation with performance approach goals (i.e., intrinsic motivation to learn, interest in psychology classes), and a low negative relationship with performance avoidance goals. Papaioannou's et al. (2012) meta-analysis in sport and physical education revealed that autonomous motivation (intrinsic and identified) was positively related to mastery goals but it had no relationship with performance (both approach and avoidance) goals, whereas controlled motivation (external and introjected) was positively associated with performance approach and performance avoidance goals.

All the above findings along with other literature reviews (e.g., Elliot & Moller, 2003; Moller & Elliot, 2006) support that mastery goal orientation would be positively related to autonomous but not to controlled motivation. Also, performance avoidance would be positively related to controlled and maybe negatively to autonomous motivation, and performance approach goal would be positively related to controlled motivation and positively related or unrelated to autonomous motivation.

Following suggestions towards synthesis and joint consideration of AGT and SDT when attempting to holistically understand human behavior in achievement situations (e.g., Butler, 1989; Ryan & Deci, 1989), this line of research has set the basis for theory integration in a robust theoretical framework, efficient to explain human behavior and to propose guidelines for enhancing individuals' motivation quality.

The compelling body of research presented above, underscores the importance of studying the relationships between AGT and SDT constructs in a variety of situations and across diverse achievement domains (e.g. education, sport, work), in order to decipher the complex psychological processes that determine individual achievement behavior. However, to our knowledge, all these relationships with their implications for practice have been overlooked in the extant literature with regard to in-service teachers, and especially during a nation-wide reform effort, aiming to promote educational innovations. To this end, it is oversimplistic to assume that what applies in every other sample (students, athletes, workers) is generalizable in teachers' case without examining it under realistic circumstances. For instance, teachers combine characteristics from two different achievement domains, work and education, and as such they must be treated with extra caution. Teachers are professionals working in educational organizations and at the same time they are integral parts of the student class and school community. Moreover, current educational trends and every day practice put teachers in the position of a student, and make it imperative for their work to immerse in the role of an active learner throughout their career. In addition, it is very important to assess the linkage of goals with self-regulations in genuine, real-life situations where challenges and obstacles are meaningful for participants. Indeed, Papaioannou et al. (2012) suggested that the vast majority of experimental or intervention studies in achievement goals research have been conducted with artificial manipulations or with the use of hypothetical scenarios.

1.6. The present research

In the present research teacher motivation quality was examined within two work tasks, (a) participation in training for innovative teaching, and (b) implementation of innovative teaching. We focused on two recent innovations in Greek education, (a) a newly introduced subject for the official curriculum of Greek high school, namely *Research Project* (i.e., a course where teachers facilitate students' group-work in

interdisciplinary- inquiry learning/projects)(Ministry of Education, 2011a); and the new pilot Physical Education (PE) curriculum in elementary and junior high schools (i.e., focusing on student-centered instruction and emphasizing socio-emotional and life skills development)(Ministry of Education, 2011b), which was presented as part of the reform effort *New School- the school of the 21st century* (FEK 2121/17-10-2011; Government of Greece, 2011a).

1.7. General research questions and hypotheses

Following literature review presented above three overarching innovative research questions guided our work:

1) Are the patterns of relationships between teacher goal orientations and motivational regulations stable irrespective of the context or the work task in hand?
2) Are teachers' individual goals, determinants of their intention to continue with innovation?
3) Is performance approach goal facilitative for teacher engagement with educational innovation?

Based on theoretical postulates and the aforementioned empirical evidence we hypothesized that (a) mastery goal would present an adaptive pattern of relationships in any case; namely, a positive association of autonomous motivation with intention, and null or negative relationships with controlled motivation, (b) performance avoidance goals would present the most maladaptive patterns of relations in any situation and task; i.e., positive linkage with controlling motivation, null or negative associations with autonomous motivation and/or intentions, and (c) performance approach goals would be positively connected with controlled motivation, with null or positive relationships with autonomous motivation and intention (Figure 6/1). In line with past research suggesting that autonomous and controlled motivation mediates the relationship between dispositional achievement goals and behavioral intentions (e.g., Papaioannou & Theodorakis, 1996), we assumed that autonomous motivation would mediate the positive effects of mastery goals on intentions to implement innovation.

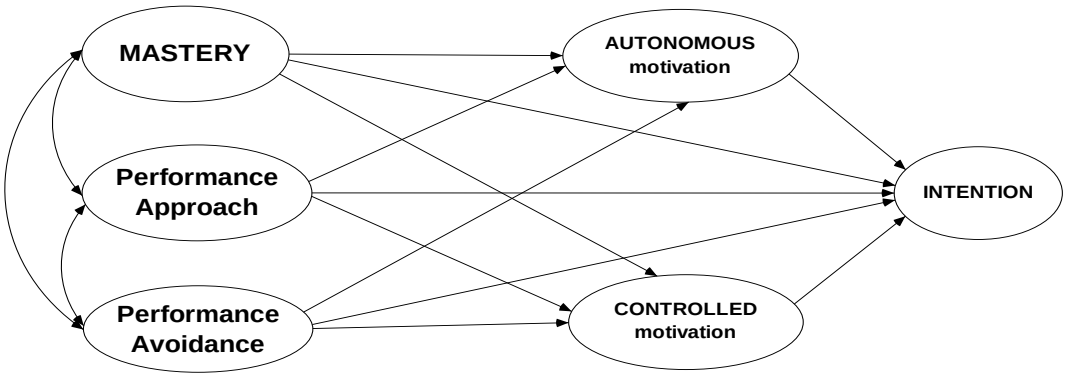

Figure 6 (1). Summary of the hypothesized models to be tested. Intention part of the model was examined only in the second study (Studies 4.1 & 4.2).

Critical to this study was the measurement of performance approach goals using only normatively referenced items which is rare in existing research in work settings (Hulleman, et al., 2010). This allowed us to investigate the connection of performance approach goals with autonomous or controlled motivation without worrying about confounding results due to scale construction (Hulleman, et al., 2010).

We investigated our task specific hypotheses across two studies. The first examined the equivalence of relationships between teachers' achievement goals and their self-determined motivation to participate in professional training across groups/conditions. The second study builds upon the findings of the first study and goes one step further by investigating the same model, regarding a different task (i.e., implementing innovative teaching), and its predictive ability on teacher intention to engage in similar behavior.

1.8. Recent educational innovations in Greece

For the purposes of the present research two recent reform efforts which were implemented in Greece, were considered. (a) At the end of the school year 2010-2011 (June), teachers of any specialization (including PE that is mentioned below) from Greek high schools, were invited to apply for an in-service training program. Participation was optional and seminars/workshops dealt with a new innovative subject namely *Research Project*, which was about to be implemented, in the next academic year. It should be noted that depending on the needs of their schools, all teachers could (were eligible to) implement the *Research Project* regardless of their academic subject area. This new subject for the formal high school curriculum, was based on four pedagogical principles, inquiry based, differentiated, cooperative

learning, and interdisciplinary teaching (Ministry of Education, 2011a). During the implementation of this subject teachers were considered to be the facilitators of the process and were expected to play multiple roles such as organizing, grouping, motivating and guiding students (Ministry of Education, 2011a).

(b) Before the beginning of the school year 2011-2012 the Ministry of Education decided to pilot test a new innovative PE curriculum in 167 (99 primary, 68 secondary) schools, which were distributed all over Greece (FEK 2121/22-9-2011; Government of Greece, 2011b). All schools were selected by the Ministry requiring from all PE teachers in these *pilot* schools, to participate in the training program regarding this reform effort. Basic characteristic of this curriculum is the focus on six basic standards to promote PE aims, offering autonomy to teachers to decide which aims to put more emphasis on, based on the special characteristics and needs of their students and school; also, a central focus can be placed not only on motor/sport skills, but on the development of social-emotional and other life skills as well.

Although these two educational innovations are not identical, they share certain similarities. Teachers attempting to implement these innovations have to redesign their lessons and instruction, to apply new student centered teaching strategies, and to focus on new educational goals outside their tradition. The first act of the Ministry to promote both innovations was two in-service training programs which were provided in the same format (workshops with small groups of teachers in two/three consecutive days, 15-21 hours). The main difference between these programs that might have affected teachers' motivation was their recruitment method. In the first case (optional condition), teachers who decided to participate in the training program were already positively predisposed to the specific innovation. In the second case, PE teachers were mandated to participate in training and to implement innovation without anyone considering their opinion about innovation.

2. Study 1

In Study 1 we examined whether the aforementioned hypotheses concerning associations between teachers' achievement goals and self-determination exist across different conditions and samples. Optional versus mandatory conditions were considered, because we wanted to examine whether the patterns of relations between achievement goals and behavioral regulations are stable irrespective of the context and work climate (i.e., to investigate if there is a different response across people who

have choice/autonomy and people who are obligated to act in a certain way/controlling). According to AGT and SDT, environmental features play a very important role in the enhancement of specific goals and the promotion of people's self-determination. The optional versus mandatory recruitment method of teachers to participate in training creates an autonomy supportive/mastery work climate versus a controlling/performance work climate respectively. It is essential to explore if a variation in this important feature of work environment changes the magnitude or even the valence of the associations between teachers' achievement goals and autonomous and controlled motivation. For example, a matching hypothesis might posit that the effects of mastery goal adoption on autonomous motivation might be stronger in an autonomy supportive environment (person-environment fit) than in a mandatory/controlling environment. Moreover, because the link between performance approach orientation and self-determined motivation varies across studies, it is important to examine whether the variation of this association depends on the autonomous/optional or controlling/mandatory dimension of the work environment. Again, in line with a matching hypothesis, performance approach goals might have positive linkage with autonomous motivation in autonomy supportive situations but not in mandatory situations.

Thus, for the purpose of the present study, two groups involved in different conditions were invited to take part. The first one (optional condition) involved public school teachers of all specializations who decided to participate voluntarily in a training program regarding a newly introduced academic subject (i.e., *Research project* for high school). The second (mandatory condition) concerned public school teachers who were obliged to participate in a training program regarding the implementation of a new PE curriculum, because their schools were eligible (by the Ministry of Education) for pilot testing of the new syllabus.

Following theoretical postulates and past research evidence that generally consider achievement goals as antecedents of behavioral regulations (e.g., Barkoukis, Ntoumanis, & Nikitaras, 2007; Malmberg, 2008; Nien & Duda, 2008; Ntoumanis, 2001; Van Yperen, 2006), it was hypothesized that:

H_1: Mastery goal orientation would predict autonomous motivation.

H_2: Performance avoidance goal orientations would predict controlled motivation.

H_3: The above patterns of relationships would be invariant across the two samples differing in condition and teacher specialization.

Due to ambiguous past findings regarding performance approach goals, no hypotheses were developed for the patterns of relationships between performance approach goal orientation and self-determined motivation. These findings and different opinions about the adaptive character of performance approach goals did not provide firm evidence in favor or against the matching hypothesis; hence no assumption was developed for the invariance of the relationship of performance approach goals with autonomous or controlled motivation.

Moreover, based on the special conditions of teacher recruitments and theoretical framework it was also assumed that:

H_4: (a) Teachers who were recruited under a controlling (i.e., mandatory) condition would be more controlled than teachers in the optional condition, whereas (b) teachers in the optional condition would be more autonomous than those in the mandatory condition.

H_5: In the case of teachers whose participation was optional, it was expected that this training program would be attractive primarily to highly mastery/learning oriented individuals. On the other hand, no hypothesis could be made regarding teachers' goal orientations in the mandatory condition which may have attracted people holding any kind of dispositions.

2.1. Method

2.1.1. Participants & Procedure

Following the approval of the University Ethics Committee, the first study was conducted at the beginning of the first academic year that (1) the innovative subject *Research Project* was included in the curriculum of Greek high school and (2) the new PE curriculum was piloted in 167 schools (primary and secondary) all over Greece. Participants of the study were assured for the anonymity and confidentiality of their responses and were invited to reply to questionnaires voluntarily. The first group (optional condition) consisted of secondary teachers (n=191) who specialized in various academic subjects (e.g., philologists, physicists, mathematicians, teachers of informatics, physical educators, etc.), geographically distributed all over the country. The basic criterion for their inclusion in the study was their voluntarily participation in the optional training program about the implementation of this new academic

subject. Sixty-eight participants were males and 123 females, with 14.2 (*SD*=7.2) years of teaching experience (ranging from 3-31 years), and 92 (48%) held a postgraduate degree. The second group of teachers (mandatory condition) were teachers with specialization in Physical Education (PE) (*n*=85) working in the 167 pilot schools that were selected by the government during the time of "reform testing". These teachers due to their job position were obligated to participate in a specific training related to the new PE curriculum. From these PE teachers 46 were males and 39 females, with 14.8 (*SD*=6.8) years of teaching experience (from 3-30 years), and 17 (20%) held a postgraduate degree.

2.1.2. Instruments

2.1.2.1. Teachers' achievement goals in teaching innovation

To measure teachers' situation specific achievement goals regarding teaching of the new subject and PE curriculum, Teachers' Achievement Goals in Work Questionnaire (TAGWQ; Papaioannou & Christodoulidis, 2007) was utilized. This instrument has been proved valid and reliable in previous studies (e.g., Gorozidis & Papaioannou, 2011). In line with the suggestion of Hulleman et al., (2010) all performance approach items of this scale are normatively referenced. Each of the three sub-scales used (mastery, performance avoidance, performance approach), consisted of four items. The opening stem was "When teaching the new academic subject *Research Project*..."(Teachers) and "When teaching the new PE curriculum..."(PE teachers); and participants responded in items such as "My goal is to continuously develop my abilities as a teacher" (mastery goals), "I will always try to outperform my colleagues" (performance approach goals), "I want to avoid teaching tasks in which I may look incapable" (performance avoidance goals). Answers were given on 5-point Likert-type scales ranging from 1 to 5 (*strongly disagree* to *strongly agree* respectively). Cronbach's alphas, of each sub-sample (n=191/85), were .73/.79 for mastery, .85/.87 for performance approach, and .78/.84 for performance avoidance goals. Additionally, separate CFAs for each sub-sample produced satisfactory fit indexes (n=191/85): TLI=.991/1.01, CFI=.993/1.00, χ^2=56.24/45.97, *df*=51, χ^2/df=1.10/.90. We relied on the TLI to interpret our findings because it is independent on small *df* and sample size (see Chen, Curran, Bollen, Kirby, & Paxton, 2008; Kenny, Kaniskan, & McCoach, 2014). The TLI varies along from 0 to 1, with

values greater than .90 indicating a good fit, and greater than .95 reflecting an excellent fit (Hu & Bentler, 1999).

2.1.2.2. Teachers' self-determined motivation to participate in training

Teachers' situational motivation regarding their participation in training was assessed using the Greek version of the Work Task Motivation Scale for Teachers (WTMST; Fernet et al., 2008; Gorozidis & Papaioannou, 2014). In the present study 4 subscales (intrinsic, identified, introjected, external) were utilized, with 3 items per scale. Following the stem "Why have you participated in this training program?" participants answered to items as, "Because I like doing it" (intrinsic), "Because I consider my training important for the academic success of my students" (identified), "To not feel bad if I don't participate in training" (introjected), "Because my position might be in danger if I don't" (external). Responses were given on a 7-point Likert-type scale ranging from 1 (*does not correspond at all*) to 7 (*corresponds completely*). Because our basic aim was to test the effect of teachers' achievement goal orientations on their autonomous and controlled motivations, two latent variables were constructed. Autonomous motivation was composed by 3 *domain representative* parcels (Kishton & Widaman, 1994) with the items of intrinsic and identified regulation; and controlled motivation comprised of 3 parcels with the items of introjected and extrinsic regulation. Cronbach's alpha for each sub-sample (n=191/85), of participants were .85/.95 and .78/.74 for autonomous and controlled motivation respectively. In addition, separate CFAs for each sub-sample produced acceptable fit indexes (n=191/85): TLI=.949/9.08, CFI=.973/.951, χ^2=20.01/24.22, *df*=8, χ^2/*df*=2.50/3.03.

2.1.3. Data analysis

Data were analyzed using the SPSS 20 and Amos 16. The factorial validity of the measurement model was assessed via confirmatory factor analyses with maximum likelihood estimation method. Scales' scores and correlations between latent variables were computed. Furthermore, multi-group structural equation modeling (SEM) analyses were conducted to examine the hypothesized model equivalence (i.e., the predictive relationships between teachers' goal orientations and their self-determined motivation to participate in training) across groups-conditions (structural model invariance testing). We decided to examine the invariance of the full model. If the

model would not be invariant then this would lead us to continue separately for each goal with the investigation of the invariance of the relationship between each goal and autonomous-controlled motivation. A baseline-unconstrained model (configural invariance) was compared against more restrictive models with additional constraints, testing the assumption of equality across groups for specific parameters each time (i.e., factor loadings, structural weights/paths, factor variance-covariance, structural residuals, measurement uniqueness). If a constrained model yielded worse model fit than the unconstrained one then the hypothesis of invariance would be rejected, suggesting that there is at least one different parameter across the two groups. Model fit was determined by the Tucker-Lewis Index (TLI), and the normed χ^2 (i.e., chi-square to degrees of freedom ratio, χ^2/df). For normed chi-square (χ^2/df), values up to 2 or even as high as 3 considered acceptable (Kline, 2005; Tabachnick & Fidell, 2007). For model comparison we calculated the chi-square change ($\Delta\chi^2$) and CFI change (ΔCFI) but because χ^2 is sensitive to sample size we emphasized ΔCFI. Thus, we followed Cheung and Rensvold (2002) suggestion that if ΔCFI between two models is up to .010 then the null hypotheses of invariance should be accepted.

2.1.4. Results and discussion

Descriptive statistics, alphas, and latent factors' correlations for Study 1 variables are presented in Table 6. A series of confirmatory factor analyses (CFA) with the latent factors and items of both instruments established the validity of the measurement model. Specifically, CFA for the total sample and separately for each sub-sample produced satisfactory goodness of fit indices, that is, for the total sample n=276: TLI=.968, CFI=.974, χ^2=178.12, df=125, χ^2/df=1.43; for each sub-sample: n=191/ 85: TLI=.967/ .910, CFI=.973/ .927, χ^2=159.57/ 184.53, df=125, χ^2/df=1.28/ 1.48). Moreover, all factor correlations were in the expected directions establishing the concurrent and divergent validity of the measures. For the total sample, in line with AGT and SDT posits, mastery goal was significantly correlated to autonomous motivation (r=.54, p<.001), while performance approach and avoidance goals were interconnected (r=.43, p<.001) and both of them were associated with controlled motivation (approach r=.31, p<.001 and avoidance r=.41, p<.001) (Table 6/1).

Table 6 (1). Means, Standard Deviations, Alphas and CFA Factors Correlations across Groups (Study 4.1; Teachers-PE teachers)

Variables	*M*	*SD*	alphas	1	2	3	4	5
			Teachers (n=191) / *PE teachers* (n=85)					
1) MASTERY	4.56/ 4.39	.42/ .44	.73/ .79		.04/ .08	-.06/ -.10	.59***/ .47**	-.13/ .00
2) P. APPROACH	2.18/ 2.32	.93/ .92	.85/ .87			.46***/.38**	.02/ -.02	.28**/ .32*
3) P. AVOIDANCE	1.96/ 2.08	.78/ .80	.78/ .84				-.02/ -.02	.41***/ .41**
4) AUTONOMOUS	5.84/ 5.88	.99/ 1.2	.85/ .95					.07/ .01
5) CONTROLLED	2.07/ 2.65	1.01/ 1.2	.78/ .74					

*Note:****p<.001, **p<.01, *p<.05*

In multi-group SEM 1 (Figure 7/2), after establishing metric measurement invariance (M2; Table 7/2) which is considered a prerequisite (Chen, 2008), predictive relationships of the model were compared across groups-conditions. The subsequent models (M3-M5) presented in Table 7 imply that the patterns and strength of relationships between goal orientations and autonomous-controlled motivation are invariant across Teachers-optional and PE teachers-mandatory condition *(H_3)*. However, in M6 invariance of measurement uniqueness was rejected (ΔCFI>.010) implying that there are differences in the way these groups responded in one or more items, perhaps due to the specific condition of reference. These analyses revealed that only mastery goal orientation was significantly linked with autonomous motivation (β=.55, p<.001) (H_1), whereas from performance goals only avoidance orientation was significantly connected with teachers' controlled motivation (β=.37, p<.001) (H_2) to participate in training (Figure 7/2). These findings confirm H_1, H_2 and H_3 hypotheses.

In addition, when variable mean scores between the two groups were contrasted, significant differences were found (Wilk's λ=.91, F(5, 270)=5.56, p<.001). Specifically, teachers in the mandatory condition scored higher in controlled motivation F(1, 274)=16.86, p<.001, partial η^2=.06, than teachers in the optional condition (H_{4a}), while no differences were found in autonomous motivation (p=.76) (H_{4b}), supporting H_{4a} but not H_{4b} hypothesis. Teachers in the optional condition scored higher on mastery goal, F(1, 274)=9.81, p=.002, partial η^2=.04, while no differences were found on performance goals. Furthermore, inspection of mean scores (Table 6/1) indicates that in both conditions teachers scored much higher in mastery goal *(H_5)* than in performance goals and higher in autonomous than in controlled motivation.

The finding that teachers in the optional condition were highly mastery oriented confirms H_5 hypothesis.

Table 7 (2). Fit Indexes for the Invariance of the Structural Model 1 across Groups (Study 4.1; Teachers-PE teachers)

Model	χ^2	*df*	χ^2/df	$\Delta\chi^2$ (Δdf)	RMSEA	TLI	CFI	ΔCFI
(M1) Unconstrained model (configural invariance)	348.45	252	1.38		.037	.945	.954	
(M2) Factor loadings constrained (metric invariance)	367.89	265	1.39	19.44 (13)	.038	.944	.951	.003
(M3) +Structural weights/paths constrained (regression weights invariance)	369.80	271	1.37	21.35 (19)	.036	.947	.953	.001
(M4) +Structural covariances constrained (factor variances & covariances invariance)	371.48	277	1.34	23.03 (25)	.035	.951	.955	-.001
(M5) +Structural residuals constrained	**381.30**	**279**	**1.37**	**32.85 (27)**	**.037**	**.947**	**.952**	**.002**
(M6) +Measurement residuals constrained (***invariance rejected***)	487.05	297	1.64	138.6***(45)	.048	.907	.910	.038

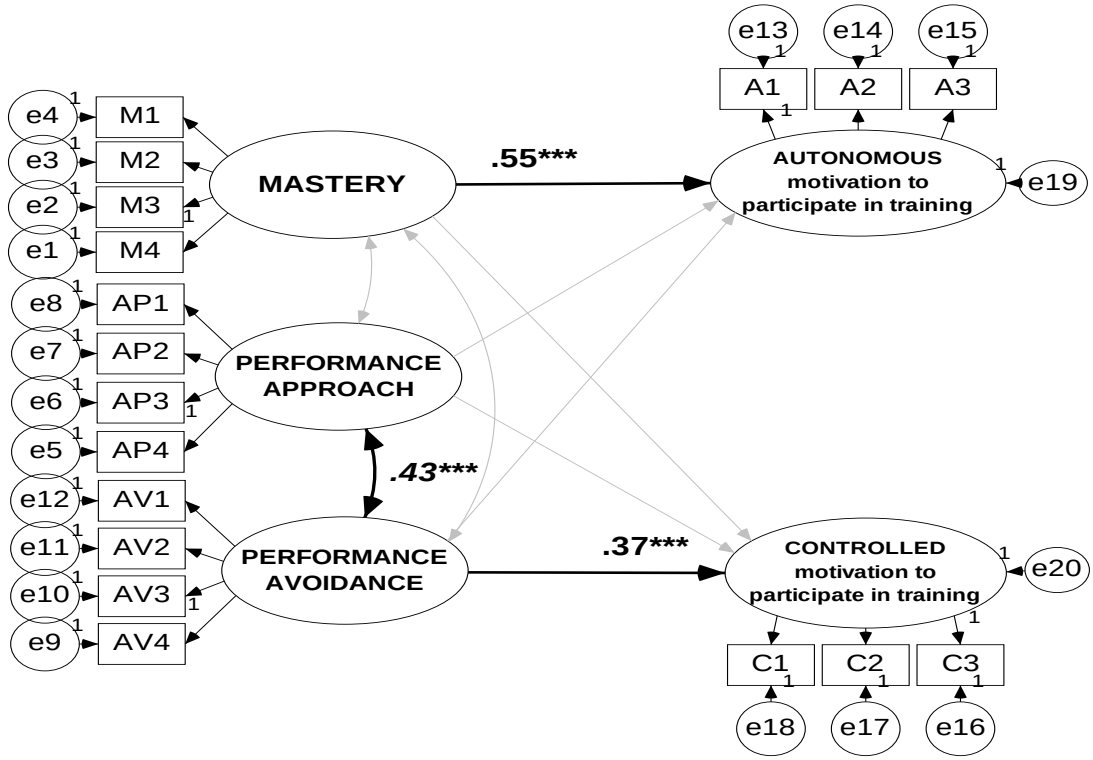

Figure 7 (2). SEM 1, depicting relations between teachers' Achievement goal orientations and their Autonomous (R^2=.30) and Controlled (R^2=.20) motivation to participate in training. *Model 5* values and only significant paths and correlation are presented (***p<.001) (Study 4.1).

3. Study 2

In Study 2 we examined again the link of achievement goals with autonomous and controlled types of motivation but now in a situation involving a different task. Task value is central across most theories of motivation including AGT and SDT. Subjective task value is comprised of interest (enjoyment), attainment (importance), utility and cost of the task for the person itself (Eccles, 2005). Higher levels of task value correspond to more positive cognitive outcomes and achievement (e.g., Pintrich, 2003, p. 114) implying that the value teachers attach to a work-task should be crucial to their motivation. Accordingly, in comparison to Study 1 a different work-task (i.e., teaching-implementing innovation) with a different underlying personal value was examined. While the first task (i.e., participation in training about innovation – Study 1) might have been meaningful and personally relevant for teachers' professional growth, the second task (i.e., implementing innovation – Study 2) may not hold the same personal value, and might be considered valuable mostly for their students' growth. Indeed, in the work task examined in the first study, teachers' mastery and personal improvement was stressed by the activity itself (i.e., participation in training); on the other hand, in the work task examined in the second study, mastery and improvement of students were stressed (i.e., implementing innovative instruction), which might not signify high personal relevance and meaning to the teachers. Moreover, while participation in training (Study 1) might have been considered valuable to performance oriented teachers due to external incentives (e.g., to gain a certification, to secure current position in school, to comply with demands), implementing the innovative program in Study 2 would appear less valuable to performance oriented teachers because at the time of this study evaluation-accountability of teacher instruction did not exist and teachers had no external incentives to implement the innovation.

In Study 2, intention to continue implementing the innovation was added in the model. Intention is considered the major determinant of behavior (e.g., Ajzen & Fishbein, 1980) and its inclusion in the model aligns with the intentional perspectives of AGT and SDT (Deci & Ryan, 2002; Nicholls, 1989). Theoretical postulates of AGT and SDT support that mastery oriented teachers would be engaged with a work task for the task itself, whereas performance oriented individuals would be involved

with a task as a mean to an end. Additionally, past research evidence suggest that teachers' mastery goal predicts through mediating variables their intention, whereas performance goals have no relation to intention (Gorozidis & Papaioannou, 2011). Based on these propositions, it was expected that:

H_6: Mastery goal would be positively linked with autonomous motivation to teach the new subject

H_7: The relationship between mastery goal and future intentions to implement innovation would be mediated by autonomous motivation.

H_8: Performance goals would be positively linked with controlled motivation.

H_9: Performance goals would have no effect on intentions to teach innovation in the future.

3.1. Method

3.1.1. Participants & Procedure

This study was conducted during the ending (June 2012) of the first school year of *Research projects* implementation in Greece. Following analogous procedures to Study 1, secondary teachers (n=140) of various specialties, who have implemented the new subject, decided to participate in the study. From these teachers 61 were males and 79 females, with 15.3 (*SD*=7.6) years of teaching experience (from 3-35 years), and 84 (60%) held a postgraduate degree. Moreover, questionnaires were distributed to PE teachers from pilot schools who were asked to implement the new PE curriculum, but only twenty of them replied, thus these data were not enough to conduct SEM and therefore, they were discarded from further analyses.

3.1.2. Instruments

3.1.2.1. Teachers' achievement goals in teaching innovation

The same instrument with Study 1 was used, which was comprised of 12 items corresponding to 3 factors.

3.1.2.2. Teachers' self-determined motivation to teach Research Project

Teachers' self-determination regarding the implementation of the new subject was assessed by a slightly modified version of the instrument used in the first study, in order to comply with the specific situation-task.

3.1.2.3. Intention to teach-implement Project

In order to assess teachers' intentions to future (next year) implement the innovation, a 2-item scale was constructed according to Ajzen's recommendation (Ajzen, 2002) which demonstrated good psychometric properties in previous studies (Gorozidis & Papaioannou, 2011, 2014). Following the statements "During the next season I plan to teach the new subject *Research Project*", and "During the next season I am determined to teach the new subject *Research Project*", teachers responded in 7-point semantic differential scales (from very likely to very unlikely, from definitely yes to definitely no respectively).

3.1.3. Data analysis

Analyses were conducted following the same procedures described in Study 1. The SEM which was constructed here intended to examine the effect of teachers' goal orientations on their self-determined motivation and in turn on future intentions regarding the implementation of the innovative academic subject.

3.1.4. Results and discussion

Descriptive statistics, alphas, and factors' correlations for Study 2 variables are presented in Table 8/3. Similarly to Study 1, CFA produced satisfactory goodness of fit indices (TLI=.974, CFI=.978, χ^2=183.83, *df*=155, χ^2/*df*=1.19), and factor correlations were in the hypothesized direction. Performance goals were interrelated and significantly associated to controlled motivation; mastery goal was significantly related to autonomous motivation and to intentions, while from behavioral regulations only autonomous motivation was related to intentions.

Table 8 (3). Descriptives, Alphas and CFA Correlations (Study 4.2; Teachers, *n*=140)

Variables	**M**	**SD**	**alphas**	**1**	**2**	**3**	**4**	**5**	**6**
1) MASTERY	**4.46**	**.54**	**.82**		.15	-.09	.56***	-06	.27**
2) P. APPROACH	**2.39**	**.90**	**.86**			.62***	.15	.48***	.05
3) P. AVOIDANCE	**2.04**	**.78**	**.78**				-.04	.46***	-.16
4) AUTONOMOUS	**5.53**	**1.19**	**.91**					.02	.67***
5) CONTROLLED	**2.07**	**.96**	**.81**						.09
6) INTENTIONS	**5.99**	**1.35**	**.88**						

*Note: ***p<.001, **p<.01*

The hypothesized model (SEM 2; Figure 8/3) fitted well to the data with TLI=.975, CFI=.979, χ^2=183.92, *df*=156, χ^2/df=1.18 (*n*=140). Only mastery goal orientation was positively linked with autonomous motivation (β=.54, *p*<.001) (*H6*) and in turn autonomous motivation was positively connected with intention (β=.74, *p*<.001) (*H7*); mediation analysis with bootstrap (1000 samples, CI at 95%, BC) revealed that mastery had an indirect effect on intentions (.39, *p*=.002), and this relationship was fully mediated by autonomous motivation (*H7*). Expectedly, only performance approach was positively linked with controlled motivation (β=.35, *p*=.01) *(H8)*, but not intention *(H9)* (Figure 8/3).

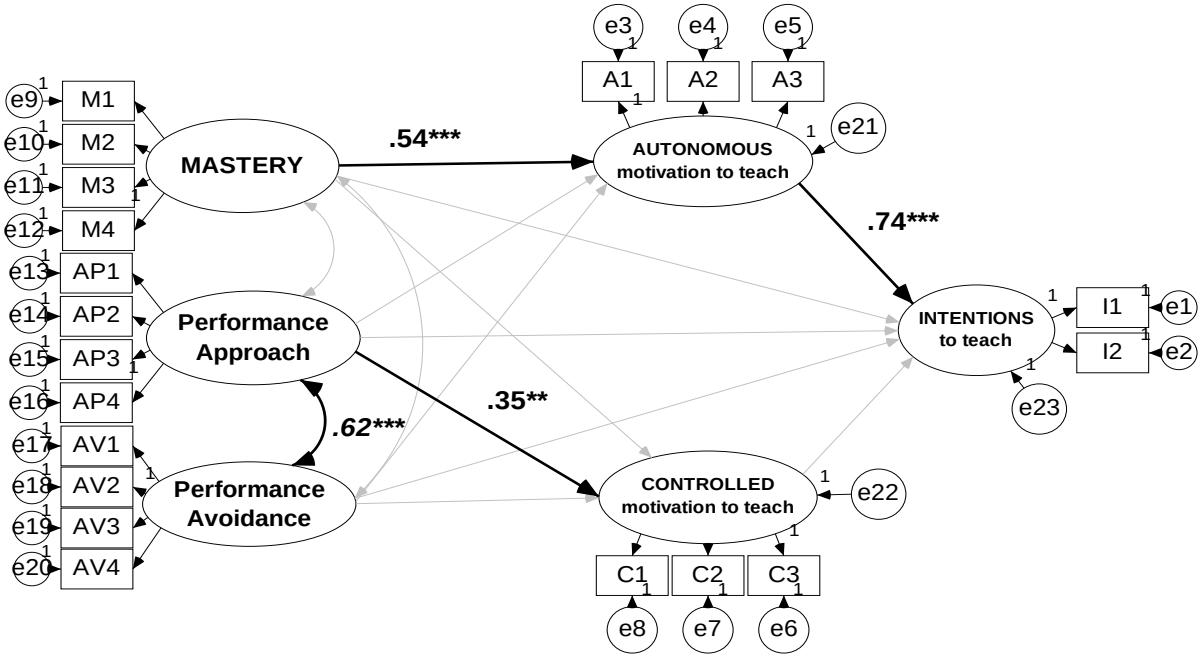

Figure 8 (3). SEM 2 depicting relations between teachers' Achievement goal orientations, their Autonomous (R^2 =.32) and Controlled (R^2 =.20) motivation, and Intentions (R^2 =.50) to teach innovation. Only significant paths and correlation are presented (**p<.01, ***p<.001) (Study 4.2).

4. General discussion

Combining the findings from both studies, mastery goal emerged as the most adaptive motivational orientation across groups-conditions and situations - work tasks, which is consistent with theoretical assumptions and empirical research evidence (e.g., Butler & Shibaz, 2008; Daniels, Frenzel, Stupnisky, Stewart, & Perry, 2012; Gorozidis & Papaioannou, 2011; Retelsdorf & Günther, 2011; VandeWalle, Brown, Cron, & Slocum, 1999). Mastery oriented teachers are more likely to pursue their

training participation relative to educational innovation autonomously (i.e., out of interest and pleasure, or because they highly value this task), irrespective of the circumstances (optional vs. mandatory recruitment). Similarly, in both work tasks examined here, only mastery goal emerged as a significant predictor of teachers' adaptive motivational regulations. These relationships are congruent with findings from studies involving students of all educational levels (i.e., primary, secondary, university), pre-service teachers, teachers, workers and athletes (Ciani, Sheldon, Hilpert, & Easter, 2011; Christodoulidis, 2004; Dysvik & Kuvaas, 2010; Malmberg, 2006; Nien & Duda, 2008; Ntoumanis, 2001; Papaioannou et al., 2009; Standage & Treasure, 2002) and suggest that mastery goal display analogous positive motivational patterns independent of the situation, context and teachers' specialization. It was also found that only mastery goal was positively associated with intention to future implement innovation at school. Mediation analysis yielded that mastery goal might be connected with intentions indirectly through teacher autonomous regulations. These findings imply that mastery goal may contribute positively in teacher autonomous motivation, which in turn can trigger their intention to implement innovations. Collectively, these results are in accordance with the notion that when individuals are mastery oriented (i.e., pursuing their personal growth), they engage in activities (i.e., participation in training) more optimally even in controlling situations. Hence, teachers displaying a mastery oriented pattern enjoy to engage and persist in a challenging activity (i.e., innovative instruction), because they recognize it as a chance for further development of their skills and practices (Dweck & Leggett, 1988; Nicholls, 1989).

Regarding performance goals, in agreement with prior teacher studies (e.g., Hoffmann et al., 2009; Retelsdorf et al., 2010), our findings yielded maladaptive or null motivational patterns which were less stable across conditions and tasks, implying that these goals (performance approach and avoidance) are more context and situation specific. This seems particularly true for performance approach goal, which had null relationship with autonomous motivation, while it was positively connected with controlled motivation to participate in training. However, as part of the model (SEM 1) including all goal orientations, performance approach had no significant contribution in the explanation of controlled regulations, and these patterns were invariant across groups-conditions. This implies that mandatory vs. optional recruitment does not alter the motivational responses of performance approach

oriented teachers. This outcome seems plausible, because during training teaching performance was not evaluated (e.g., there were no final test/exams assessing teachers' understanding of how to implement innovations), thus teachers did not have the possibility to exhibit their teaching ability. In contrast, when it came to the task of implementing innovation, performance approach goal relationship with controlled motivation was magnified yielding a direct effect on controlled regulations. Indeed, performance approach oriented individuals might have experienced controlled types of motivation (e.g., to be rewarded, conforming to authorities) when teaching innovative subjects, because during this task they had the chance to demonstrate superior competence relative to their colleagues who did not select to implement innovation. However, this predictive relationship was not enough to explain teacher's intention to teach innovation in the future.

On the other hand, in relation to performance avoidance goal it was found that its associations with autonomous and controlled motivation was more stable across groups-conditions and tasks. Expectedly, in all cases performance avoidance goal had null relationships with autonomous regulations but positive relationships with controlled regulations. It seems reasonable that performance avoidance oriented teachers while striving to avoid unfavorable judgments in case of teaching innovation, might engage in training for external reasons (e.g., to comply with external demands or feelings of pressure, shame), regardless of the recruitment method, which might explain the magnitude of relationship and the predictive ability of this goal on controlled motivation to participate in training. It should be noted here that these particular teacher training programs did not include any evaluation; hence, this work task did not include any risks for teacher competence appraisal. However, in the implementation of innovation, the explanation of controlled motivation by performance avoidance goal was mediated by its relationship with performance approach goal.

Furthermore, in line with predictions it was found that physical educators who were recruited without having a choice to act differently, were more controlled motivated to participate in training than teachers who had the opportunity to choose their participation. However, the controlling feature of the environment (recruitment method) did not thwart PE teachers' autonomous regulations, possibly because they acknowledged that the training program would be interesting and valuable to them. In

addition, as it was expected, the autonomy supportive feature of the environment attracted mostly mastery oriented teachers.

The finding that performance approach goals did not relate to autonomous motivation or intention, suggest that the multiple goal perspective (Harackiewicz et.al. 2002), supporting that performance approach goals is adaptive, does not apply with regard to teachers' involvement with educational innovation. This is congruent with studies in work and teaching domains (Dyvsik & Kuvaas, 2013; Butler & Shibaz, 2008; Retelsdorf et al., 2010) showing that performance approach goals may not predict adaptive patterns and outcomes in situations and contexts where academic (graded) performance is not the first priority. Overall, our findings are in line with the theoretical tenets of AGT and SDT, and recent findings in the domain of teaching revealing adaptive motivational patterns for mastery goal oriented teachers and less adaptive motivational patterns regarding performance oriented teachers (Butler & Shibaz, 2008, 2014; Gorozidis & Papaioannou, 2011; Papaioannou & Christodoulidis, 2007; Retelsdorf & Gunther, 2011).

4.1. Implications

Teachers' quality of motivation regarding innovation, until recently had received little attention. This situation is worrisome since the kind of motivation guiding teacher work behavior is essential for gaining qualitative in-depth educational results. Moreover, globally, there is a trend for policy makers to be concerned mostly with teacher motivation in quantitative terms because quantity is directly observable. However, when approaching teacher motivation in this way it is inevitable to construct educational work environments inducing performance goals and controlling reasons for implementing innovations. Indeed, the general tendency in education is obligating, or awarding teachers incentives (mostly materially defined) to promote their participation in professional development (e.g., European Commission/EACEA/ Eurydice, 2013). For example according to the European Commission report (Eurydice, 2013), for most EU countries, job promotion is the most important incentive for teacher' participation in training. In some educational systems it is imperative in order to stay in the profession, and in other cases grants, monetary allowances and salary increments are offered (European Commission/EACEA/ Eurydice, 2013). But the kind of motivation that will emerge by these policies is most certainly leading to superficial educational outcomes.

Alternatively, if the aim of an educational system is to foster the quality of student attainments, initially it should focus on promoting teacher quality of motivation to the most optimal level in every aspect of their job (i.e., fostering mastery goal and autonomous motivation while diminishing performance goals and controlled motivation). This aim could be achieved if decision makers create a mastery oriented climate supporting teacher autonomy. The basic characteristics of such environments include an emphasis on personal improvement, effort and persistence; the provision of frequent opportunities for cooperation and experimentation, corrective feedback and support by colleagues and specialists. These features of teachers' work environments are contrary to the promotion of competition between teachers and the stress with normative evaluation criteria (with rewarding and/or punishing extensions), which are currently used in many teacher accountability systems worldwide. AGT and SDT literature is generally congruent on how the most supportive environments can be constructed to foster teacher mastery orientation and autonomous motivation (e.g., Baard, 2002; Deci & Ryan, 2000; DeShon & Gillespie, 2005).

4.2. Limitations and future research

One limitation of this study is that it was based on cross-sectional data and thus causality in relationships cannot be inferred, nevertheless, our analyses are supported by well established theoretical postulates and past research evidence confirming the present findings (e.g., Barkoukis et al., 2007; Conroy, Kaye, & Coatsworth, 2006; Elliot & Church, 1997; Nien & Duda, 2008). Another limitation is that only teachers' self-reports were used and more types of data (e.g., longitudinal, interviews, observation) would be of great value to get a more comprehensive picture of the whole situation. A useful line of research in the future could focus on the effects of different structured educational environments for educators (mastery-autonomy supporting vs. performance-controlling) on their actual professional behavior and in turn on students' motivation and behavior.

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5.3 PE teachers' self-efficacy (Quantitative/ Publications 6 & 7)

Future directions study: Incorporating teachers' self-efficacy in motivational studies investigating educational innovations

Physical educators' self-efficacy in the implementation of the new curriculum for the "New School of the 21st century". Validation evidence of a new instrument [11]

Abstract

Research in education consistently shows that teachers' self-efficacy beliefs are instrumental for their teaching behavior and the adoption of any reform effort. Teachers' self-efficacy towards the successful implementation of curriculum goals and standards may determine the acceptance or rejection of curriculum various parts. Thus, self-efficacy assessment seems very important for the design of teacher training promoting educational innovations. The purpose of this study was to evaluate the factorial validity and reliability of a newly developed self-efficacy instrument, and to examine Physical Education (PE) teachers' self-efficacy, in teaching the six basic standards (Std.) of the new national Greek PE curriculum (i.e., reform effort "New School- the school of the 21st century", 2011-2012 school year), and its relationships with their achievement goals. In total, 149 in-service PE teachers responded voluntarily in anonymous questionnaires (92 from pilot and 57 from typical schools; 74 primary, 75 secondary school; 83 males, 66 females). Cronbach's alphas yielded satisfactory values for every subscale supporting scales' internal consistency. Confirmatory factor analysis produced acceptable goodness-of-fit indices supporting the construct validity of the instrument. PE teachers held relatively high self-efficacy beliefs to implement most of the standards. One-way RM-ANOVA revealed differences among the teachers' self-efficacy on the six standards. Educators' efficacy was lower in developing: students' fitness level through their exercise self-regulation (Std. 3), a responsible sporting and social behavior (Std. 6), understanding and respect for diversity of people (Std. 5). Furthermore, MANOVA's revealed that differences also exist between gender, and school level. Women demonstrated higher levels than men, while primary school teachers had higher self-efficacy than secondary school teachers. Total self-efficacy was positively related with teachers' mastery goal orientation supporting the external validity of the instrument. Overall, analyses produced preliminary evidence of validity for this new instrument which may prove a useful tool to monitor physical educators' self-efficacy regarding the latest PE curriculum reform. It is suggested that physical educators' in-service training need to be provided in a mastery oriented way, to target in the improvement of individual self-efficacy, relative to specific curriculum standards, while during training teacher gender and school level might need to be taken under consideration.

[11] **Study 5: Parts of this study have been published (a) by Hellenic Association for Physical Education, in the peer-reviewed journal *Inquiries in Sport & Physical Education, volume 10*(3), *91-101*, 2012 (Publication 6; Gorozidis, Papaioannou, & Diggelidis, 2012), and (b) by the Department of Physical Education and Sport Science of University of Thessaly (Trikala, Greece), in the 13th Conference of Sport Psychology proceedings of 2014, as a short paper (pp. 147-151)(Pilot 2/ Publication 7; Gorozidis, Papaioannou, Diggelidis, & Syrbas, 2014).**

Introduction

A central concept in the theories of the present PhD research is individuals' perceptions of personal competence. A relative construct is self-efficacy, termed as, people's judgments of personal competencies to organize and perform successfully specific tasks under specific circumstances (Bandura, 1997). According to Schunk & Pajares (2005) *"self-efficacy research findings are representative of the larger research literature on perceived competence constructs"* (p. 85).

The focal point of AGT is that individuals are oriented towards specific competence-related purposes or goals for action in achievement situations, and refers to competence multidimensionally. These achievement goals - i.e., developing competence (mastery), demonstrating competence (performance approach), and hiding incompetence (performance avoidance) - determine their personal criteria of success and guide cognition, affect, and behavior (Elliot, 2005).

In SDT competence is a unidimensional construct and is described as a universal innate human need which must be satisfied in order to promote self-determination and well being. According to Ryan and Deci, *"self-efficacy (called perceived competence within SDT) is a necessary condition for motivation"* (2006, p. 1570) and "*people must not only experience perceived competence (or self-efficacy), they must also experience their behavior to be self-determined if intrinsic motivation is to be maintained or enhanced"* (2000, p. 57).

According to TPB (Ajzen, 1991) self-efficacy beliefs (termed as perceived behavioral control within TPB) together with intention may directly predict behavior (Ajzen, 1991). Because intention is considered the immediate predecessor and major determinant of the behavior (Armitage & Conner, 2001), in this PhD, intentions were examined as future behavior indicator/manifestation to study teacher motivation relative to educational innovation. According to Ajzen (1991), the significance of intention and perceived behavioral control may vary across tasks and situations. In situations where the person is in absolute control of his behavior (e.g., voluntary participation in training) intention may be enough to predict action (Ajzen & Fishbein, 1980). However, in cases where volitional control of a person is low (e.g., mandatory participation in training or implementation of innovations), perceived behavioral control (or self-efficacy) may become very important for the prediction of a behavior (Ajzen, 1991).

This importance of competence perceptions (such as self-efficacy) for the theoretical foundation of this PhD research, led to a future direction study investigating PE teachers' self-efficacy beliefs with regard to the new curriculum This is the first study to investigate the development of a new multidimensional self-efficacy instrument of teachers' beliefs in their capabilities to successfully implement the core aspects (i.e., aims/standards) of this innovative PE curriculum.

According to self-efficacy theory (Bandura, 1997) teachers' self-efficacy beliefs are main determinants of the choices they make in every day routines, their persistence in specific goals and their resistance in the face of difficulties. Teachers' self-efficacy is concerned with their capability beliefs to organize and execute a given educational task or goal successfully in a specific school context (Bandura, 1997; Tschannen-Moran et al., 1998). The role of teachers' self-efficacy in the implementation of new curricula has been revealed in a various studies. For instance, in studies in general education teachers' self-efficacy beliefs emerged as essential determinants of teaching outcomes and students' achievement (Ashton & Webb, 1986; Tschannen-Moran, Woolfolk-Hoy, & Hoy, 1998), and very important cognitions for the acceptance and implementation of instructional innovations (Evers, Brouwers, & Tomic, 2002; Ghaith & Yaghi, 1997; Ross, 1994). These findings have been replicated in Physical Education domain. For example, in the Greek context, self-efficacy beliefs have been related to different use of teaching styles (Stephanou & Tsapakidou, 2008). Furthermore, our previous studies revealed that the implementation of new curriculum is determined by teachers' self-efficacy beliefs (Gorozidis & Papaioannou, 2010, 2011; Gorozidis, Tzioumakis, & Papaioannou, 2011). Indeed, in these studies it emerged that teachers' self-efficacy beliefs were important mediators of their achievement goals and intentions to implement the newly introduced PE curriculum (Gorozidis & Papaioannou, 2011; Gorozidis, Tzioumakis, & Papaioannou, 2011). It seems that teachers' self-efficacy in applying and implementing curriculum goals and standards during their teaching is of great significance for the adoption of any reform effort.

Additionally, in the previous section (Ch.5 Section 5.2.) it was suggested that teachers' mastery goal orientation need to be fostered in order to promote participation in professional training and intentions to implement educational innovations (Gorozidis & Papaioannou, 2015). Past findings show a significant connection of teachers' self-efficacy beliefs with their mastery goal orientation, their

tendency towards development and improvement of personal competencies (Christodoulidis, 2004; Gorozidis & Papaioannou, 2011). Most importantly, Gorozidis and Papaioannou (2011) found that highly efficacious and mastery oriented physical educators had the most positive attitudes and future intentions towards a newly introduced curriculum, and reported that have implemented the proposed curriculum in a higher degree. Expectedly, since mastery oriented individuals strive for end in itself goals (Nicholls, 1989), teachers with this disposition tended to present higher levels of personal teaching efficacy towards educational aims that are an end in itself, such as self-efficacy in promoting students' exercise self-regulation. In turn, these self-perceptions of competence explained new curriculum implementation and intention to implement it next season. On the other hand performance approach oriented PE teachers exhibited higher self-efficacy towards means to-an-end instructional goals, such as self-efficacy in student-centered teaching styles which is a mean to achieve central curriculum aims (i.e., fostering students' self-regulation in physical activity). In turn, these self-efficacy beliefs explained new curriculum implementation but not intention to future implement it (Gorozidis & Papaioannou, 2011). This evidence implies that mastery oriented teachers implemented new curriculum with higher self-efficacy in its central aims. At the same time, performance approach oriented teachers presented higher self-efficacy only in interim (secondary/mediational) instructional aims, and low attitudes and intentions towards the new curriculum, implying that they might have implemented it superficially, without necessarily pursuing the actual curriculum goals (Gorozidis & Papaioannou, 2011).

Because self-efficacy refers to context and task specific self-perceptions, it has to be measured with regard to specific curriculum aims/standards. In existing instruments self-efficacy is considered either as a unidimensional construct measuring general teaching or personal efficacy (e.g., Christodoulidis, 2004), or assesses self-efficacy towards a general or some mediational curriculum aims (e.g., Gorozidis & Papaioannou, 2011). This means that existing instruments are unable to capture PE teachers sense of efficacy towards the multiple standards of the new PE curriculum with great accuracy. The reason is that these multiple aims of the new curriculum demand different teaching skills in order to be achieved. For instance, several PE teachers with high self-efficacy in promoting traditional goals of the PE curriculum, like pupils' sport skills, might have low self-efficacy in promoting contemporary

goals of the PE curriculum, like pupils' physical activity, social and life skills. Hence, investigating the impact of teacher education programs on teachers' self-efficacy to implement innovation in education should employ multidimensional self-efficacy measures. Utilizing this kind of measures, strengths and weaknesses of teachers'sense of efficacy towards specific curriculum aims can be identified and targeted in order to improve. Recent studies demonstrated that well-designed professional development programs/interventions can significantly influence physical educators' self-efficacy (Martin, McCaughtry, & Kulinna, 2008; Martin, McCaughtry, Kulinna, & Cothran, 2008; Martin, McCaughtry, Kulinna, & Cothran, 2009). This means that the new instrument constructed here may provide important data for the design of future interventions/seminars aiming to effectively enhance PE teachers' efficacy on the core aims/standards of the present curriculum.

Purposes-Significance-Hypotheses

The above evidence underlines the necessity of developing a multidimensional instrument to assess teachers' self-efficacy beliefs towards end-in-itself educational aims, contrary to means-to-an-end educational aims (e.g., other teaching purposes). For instance, the innovative parts of the new pilot PE curriculum, which was studied in the present PhD, were designed to focus on the attainment of six specific central PE aims/standards. Thus, the purpose of this study was the development and evaluation of the factorial validity and internal consistency, of a newly constructed self-efficacy instrument, measuring PE teachers' sense of efficacy in implementing the six basic aims/standards of the new national PE curriculum, which was firstly introduced to be piloted in 167 selected schools all over Greece (i.e., New School- the school of the 21st century, 2011-12 school year) (http://ebooks.edu.gr/info/newps/Φύση και Άσκηση/ΠΣ για Φυσική Αγωγή — Πρόλογος.pdf). These aims/standards were (a) Motor and sports skills development, students' satisfactory perform some basic and complex motor and sports skills (Std. 1), (b) Knowledge acquisition from sports science, students effectively apply sport related knowledge in their engagement with physical activities (Std. 2), (c) Development of a fitness level for better health through students' exercise self-regulation, students set and pursue personal goals for physical activity in out-of-school settings (Std. 3), (d) Attainment of positive experiences from sports and physical activity and development of self-expression and sociability (Std. 4), (e) Development of understanding and respect for diversity of people and

cooperativeness (Std. 5), (f) Development of responsible sporting and social behavior, students demonstrate responsibility as a result of participation in physical activity and sport (Std. 6).

Factorial validity of the six-dimensional instrument was examined through confirmatory factor analysis (CFA). In addition, in order to establish convergent and divergent validity of the instrument, relationships between self-efficacy and teachers' achievement goals, measured by a valid and reliable instrument (TAGWQ; Gorozidis & Papaioannou, 2015; Papaioannou & Christodoulidis, 2007), were examined. Based on previous evidence (Gorozidis & Papaioannou, 2011) it was expected that mostly mastery and maybe performance approach goal orientations will be positively related with teachers' self-efficacy, whereas performance avoidance goal will have no significant relationship with self-efficacy.

Furthermore, this study aimed to explore PE teachers' efficacy levels, and to investigate if there are any differences across different curriculum standards or between groups of teachers (i.e., primary-secondary education, men-women). Due to their limited experience and knowledge with some aims, it was expected that teachers would feel less efficacious in curriculum aims (e.g., Std 3, 5, 6) that were secondary or limited in volume in the previous PE curriculum or their pre-service education. In addition, due to primary-secondary school differences in Greek PE context, such as limited PE time allocation and students' motivation (Digelidis & Papaioannou, 1999) in secondary compared to primary schools, it was expected that primary school teachers would be more efficacious than secondary school teachers. No hypothesis was made on gender differences due to lack of evidence in previous studies (Gorozidis, 2009; Christodoulidis, 2004).

In general, it was anticipated that this preliminary study would provide useful information about teachers' perceived strengths and weaknesses regarding the implementation of the new curriculum standards, and a handy tool to be used in future interventions and in-service training programs, promoting the implementation of the specific PE curriculum.

Methods

Participants-Procedure: The total sample which was used in the study comprised 149 in-service Physical Educators (83 males, 66 females/ 74 primary, 75 secondary schools) (Gorozidis et al., 2014). From them 57 in-service PE teachers (35 males, 22

females/ 21 primary, 36 secondary schools) were working in general schools and responded only to self-efficacy relevant questionnaires, in order to examine the factorial validity of the newly constructed instrument through CFA[12]. These teachers were excluded from further analyses because they did not participate in the training and implementation process of the educational innovation under study. The rest 92 (48 males, 44 females/ 53 primary, 39 secondary schools) of the sample who were working in pilot schools, have been purposefully recruited through the training program held by the Ministry of Education about the new innovative PE curriculum (2011-2012 school year; *New school of the 21st century*). Before the first training session hand-pencil questionnaires were distributed to the 126 participants of the program held in five peripheral training centers all over Greece (PEK; Athens, Thessaloniki, Patra, Piraeus, Kozani). Questionnaires completed voluntarily in the presence of the researcher or the instructor who provided clarifications when needed, and were returned before the end of the meeting, while teachers' anonymity and confidentiality were reassured. The PE teachers who replied were 92 (48 males, 44 females/ 53 primary, 39 secondary school) with 3-30 years of teaching experience (15.2±6.9 years). From them 53 were teaching in primary and 39 in secondary schools. Postgraduate degrees were held by the 20% (n=18) of the respondents. This sample was used to examine differences in self-efficacy between groups of teachers (see Gorozidis et al., 2012), and the relationships of teachers' self-efficacy with their achievement goal orientations relative to the innovation (external validity of the instrument).

Instrument development: This instrument was used only for the future directions study (Pub.6 & Pub.7) which was complementary to the main studies. Based on Self-Efficacy Theory (SET; Bandura, 1997) and Bandura's guide for the construction of self-efficacy scales (Bandura, 2006), as well as our prior experience with SET measures (Gorozidis & Papaioannou, 2011; Gorozidis, Tzioumakis, & Papaioannou, 2011), a new instrument was developed, divided in six subscales (3-4 items each, a total of 22 items), to capture PE teachers' self-efficacy in the implementation of the

[12] Westland (2010) consolidated and summarized Boomsma's (1982) and Marsh et al.'s, (1996; 1988; 1998) suggestions for the lower bound on sample sizes required for CFAs in the formula:
$n \geq 50r^2 - 450r + 1100$ (where r is the ratio of indicators-observed variables to latent variables). Based on this formula, a minimum sample of 123 participants would be appropriate to examine the present model structure.

six basic standards (Std.) of the new PE curriculum (see Table 1) (http://ebooks.edu.gr/info/newps/Φύση και Άσκηση/ΠΣ για Φυσική Αγωγή — Πρόλογος.pdf). Following the stem "In your school, how confident are you that you can help all students…" participants responded in items such as "…develop basic sports skills" (Std.1, 3 items), "…learn how to promote physical fitness and health" (Std.2, 4 items), "…set and reach goals of regular physical activity outside school settings" (Std.3, 4 items), "…gain positive experiences from their participation in sports & physical activities" (Std.4, 4 items), "…understand and respect individual differences" (Std.5, 4 items), "…demonstrate responsible sports & social behavior" (Std.6, 3 items). Answers were given on 11-point scales ranging from 0-100% (0%=not confident at all, 100%=absolutely confident).

Teachers Achievement goal orientations: Teachers achievement goal orientations with regard to the specific PE innovative curriculum were measured with the same instrument (TAGWQ; Papaioannou & Christodoulidis, 2007) which was described in the previous study (Gorozidis & Papaioannou, submitted), and produced acceptable reliability scores (alphas >.81) and validity indices (TLI=1.02, CFI=1.00, RMSEA=.00, χ^2=45.55, *df*=51, χ^2/*df*=.89).

Statistics: Construct validity was examined with CFA, which was conducted using maximum likelihood estimation method (AMOS 16 statistical package). Internal consistencies were examined with Cronbach's α. Differences across self-efficacy Std. examined with RM-ANOVA, and between teacher groups with MANOVA. Finally, external validity was examined with Pearson correlation, by computing the relationships between teachers' achievement goals and their self-efficacy in each Std. and their total score of self-efficacy.

Results

Construct Validity: CFA produced acceptable goodness-of-fit indices supporting the structure of the initial 22 item 6-factor correlated model (Figure 9) TLI=.912, CFI=.926, RMSEA=.86, χ^2=406.6, *df*=194, χ^2/*df*=2.1. Internal consistency was verified with acceptable Cronbach's α (>.74) for each subscale (Table 9/1).

Modification indices inspection indicated that the model fit could further improve. Thus, an alternative shortened 18-item 6-factor correlated model (3 items

per factor) was tested yielding a significantly better model fit (Figure 10). TLI= .95, CFI=.96, RMSEA=.69, χ^2 =204.53, *df* =120, χ^2/df=1.70. Internal consistency again, was satisfactory, with Cronbach's α >.77 for every subscale.

Table 9 (1). Alphas, means standard deviation and items per scale (Full version instrument) (Study 5/ Pilot 2; PE teachers)

Variables - Self-efficacy in developing…	Cronbach's *α*	*M*	*SD*	items
Standard 1 (…motor & sports skills)	**.74**	**9.05**	**1.39**	**3**
Standard 2 (…knowledge acquisition from sports science)	**.83**	**8.56**	**1.51**	**4**
Standard 3 (…fitness level & exercise self-regulation)	**.94**	**7.23**	**1.99**	**4**
Standard 4 (…positive experience from sports– sociability)	**.92**	**8.46**	**1.83**	**4**
Standard 5 (…understanding-respect for peoples' diversity)	**.94**	**8.44**	**1.71**	**4**
Standard 6 (…responsible sporting and social behavior)	**.90**	**8.18**	**1.73**	**3**
Note: in parenthesis is a short title of each standard				

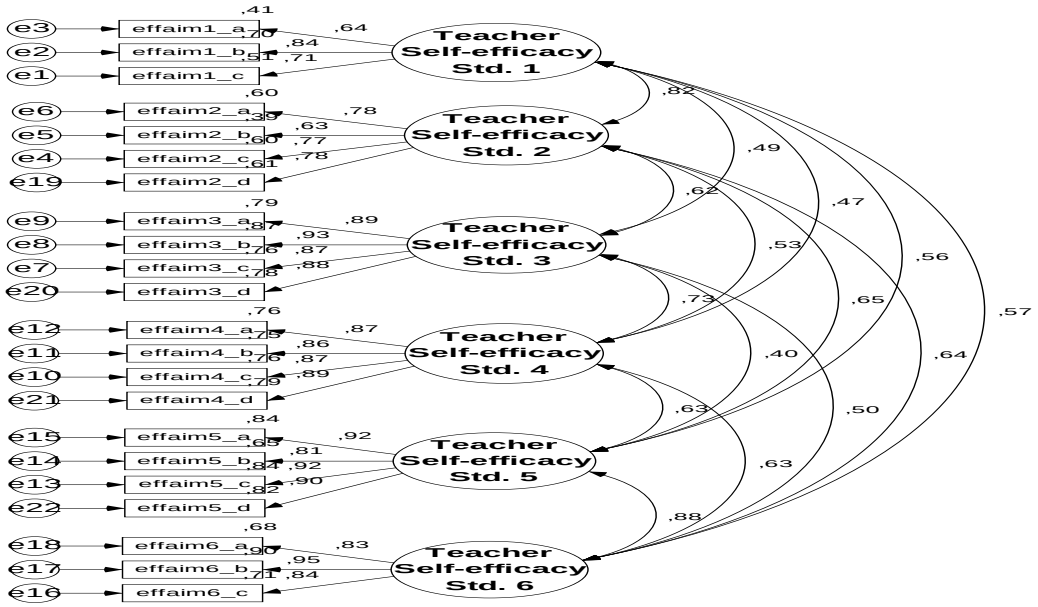

Figure 9 (1). CFA full instrument (Study 5/ Pilot 2)

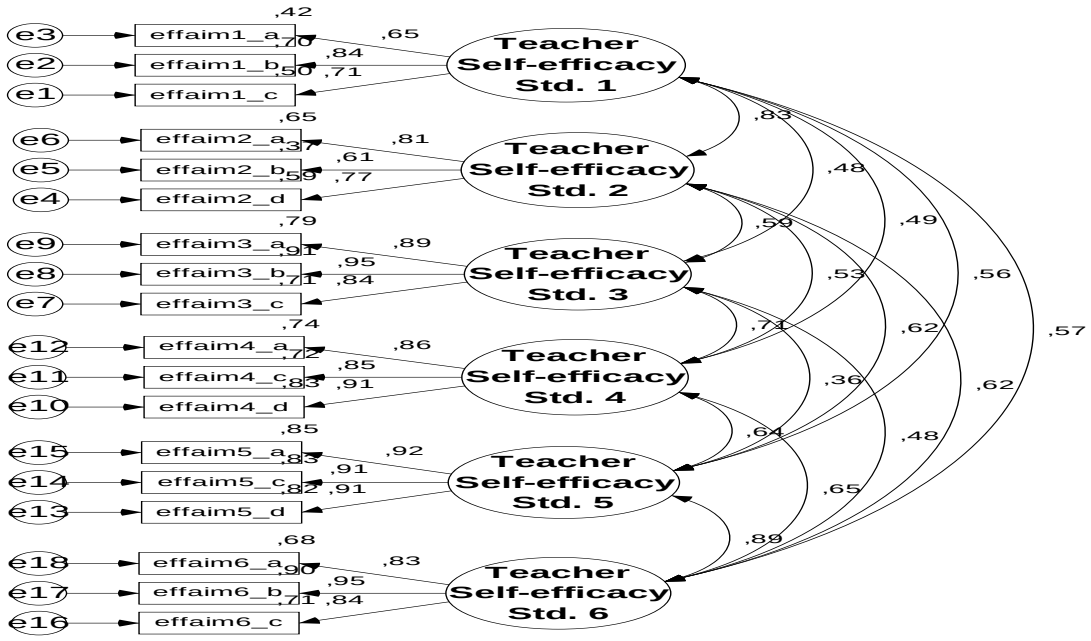

Figure 10 (2). CFA shortened instrument (Study 5/ Pilot 2)

External Validity. Relationships with teacher achievement goals: In the subsequent analyses only the sample participating in the innovation was utilized. To examine instruments' external validity a total self-efficacy variable was computed from the scores of the six-sub scales. Next, Pearson correlations were calculated between the total self-efficacy variable and mastery, performance approach, and performance avoidance goal orientations (Table 10/2). Also, the relationships of the six sub-scales with teachers' achievement goals were computed. Expectedly, it was found that physical educators' total self-efficacy to implement the basic standards of the curriculum was significantly related to their mastery goal orientation. However, no meaningful relationship was found with performance approach goal; and as anticipated null relationship also emerged with performance avoidance goal. In particular, mastery goal orientation tended to present the most positive correlations with all self-efficacy scales and it was significantly related with self-efficacy in Std.4 and Std. 6 (Table 11/3).

Table 10 (2). Descriptives and Pearson correlation of the scales (Study 5; PE teachers)

N=92	Mean	SD	**α**	Mastery	Perf. Appr.	Perf. Avoid.	Self-Efficacy Tot.
Mastery	4.4	.45	.81	-	.09	-.13	**.21***
Perf. Approach	2.3	.96	.88		-	**.27***	.06
Perf. Avoidance	2.1	.79	.82			-	-.02
Self-Efficacy Total	8.5	1.3	.88				-

*Note: *p<.05*

Table 11 (3). Pearson correlation between self-efficacy scales and achievement goals

N=92	Mastery	Performance Approach	Performance Avoidance
Self Eff. in Std. 1	.11	.14	-.16
Self Eff. in Std. 2	.11	.08	.03
Self Eff. in Std. 3	.09	-.03	.09
Self Eff. in Std. 4	.30**	.05	.02
Self Eff. in Std. 5	.20	.07	-.03
Self Eff. in Std. 6	.24*	.02	-.07

Note: *p<.05, **p<.01

Self-efficacy differences: All scales again, produced acceptable reliability scores and medium to high positive relationships ($r > .42$, $p<.001$). Mean and standard deviation inspection (Table 12/4) showed that Physical educators present relatively high self-efficacy in applying most of the basic aims/standards of the new curriculum.

Table 12 (4). Alphas, means, standard deviation and number of items per scale (Study 5; PE teachers)

Variables - Self-efficacy in developing…	Cronbach's *α*	*M*	*SD*	items
Std. 1 (…motor & sports skills)	**.69**	**9.07**	**1.39**	**3**
Std. 2 (…knowledge acquisition from sports science)	**.83**	**8.58**	**1.52**	**4**
Std. 3 (…fitness level & exercise self-regulation)	**.95**	**7.39**	**2.07**	**4**
Std. 4 (…positive experience from sports– sociability)	**.90**	**8.85**	**1.57**	**4**
Std. 5 (…understanding-respect for peoples' diversity)	**.95**	**8.49**	**1.68**	**4**
Std. 6 (…responsible sporting and social behavior)	**.90**	**8.33**	**1.58**	**3**

Note: in parenthesis is a short title of each standard

However, one-way RM-ANOVA showed that some differences exist in self-efficacy across different standards (Mauchly's $\chi^2=83$, $p<.001$, Greenhouse-Geiser $\varepsilon=.71$, $F(3.55, 322.6)=26.22$, $p<.001$, $\eta^2=.22$). Paired wise contrast revealed several statistical differences: a) teachers had higher scores on self-efficacy in Std. 1, than in standards 2, 3, 5 and 6 ($p<.001$), b) self-efficacy in Std.3 was the lowest ($p<.001$), c) self-efficacy in Std. 4 was higher than Std. 5 ($p<.01$) and Std. 6 ($p<.001$).

Furthermore, MANOVAs revealed that differences also exist across gender and school level. Based on Wilks' λ, statistical significant differences emerged

between genders λ=.72, $F(6, 83)=5.31$, $p<.001$, $\eta^2=.28$, and school levels λ=.85, $F(6, 83)=2.48$, $p<.05$, $\eta^2=.15$. Separate univariate analyses of variance followed indicating that women scored higher in self-efficacy in Std. 2, $F(1, 88)=12.37$, $p<.001$, $\eta^2=.12$, in Std. 4, $F(1, 88)=13.21$, $p<.001$, $\eta^2=.13$ and in Std. 6, $F(1, 88)=4.56$, $p<.05$, $\eta^2=.05$, from men (Table 13/5). Physical educators teaching in primary schools indicated higher scores in self-efficacy in Std. 1, $F(1, 88)=4.39$, $p<.05$, $\eta^2=.05$, in Std. 3, $F(1, 88)=5.31$, $p<.05$, $\eta^2=.06$ and in Std. 4, $F(1, 88)=5.10$, $p<.05$, $\eta^2=.05$, from their junior high school counterparts (Table 14/6).

Table 13 (5). Gender differences (Study 5; PE teachers)

Variables - Self-efficacy in developing…	Women (*n*=44)		Men (*n*=48)			partial
	M	*SD*	*M*	*SD*	*p*	η^2
Std. 1 (…motor & sports skills)	9.20	1.12	8.94	1.61	.393	.01
Std. 2 (…knowledge acquisition from sports science)	9.14	1.21	8.08	1.61	**.001**	.12
Std. 3 (…fitness level & exercise self-regulation)	7.70	1.91	7.09	2.19	.287	.01
Std. 4 (…positive experience from sports– sociability)	9.43	1.07	8.32	1.78	**.000**	.13
Std. 5 (…understanding-respect for peoples' diversity)	8.75	1.41	8.26	1.88	.111	.03
Std. 6 (…responsible sporting and social behavior)	8.68	1.17	8.01	1.84	**.035**	.05

Table 14 (6). Primary-Secondary school differences (Study 5; PE teachers)

Variables - Self-efficacy in developing…	Primary (*n*=53)		Secondary (*n*=39)			partial
	M	*SD*	*M*	*SD*	*p*	η^2
Std. 1 (…motor & sports skills)	9.36	1.11	8.68	1.64	**.039**	.05
Std. 2 (…knowledge acquisition from sports science)	8.67	1.25	8.47	1.84	1.00	.00
Std. 3 (…fitness level & exercise self-regulation)	7.84	1.93	6.76	2.12	**.024**	.06
Std. 4 (…positive experience from sports– sociability)	9.24	1.18	8.33	1.88	**.026**	.05
Std. 5 (…understanding-respect for peoples' diversity)	8.60	1.49	8.34	1.92	.744	.00
Std. 6 (…responsible sporting and social behavior)	8.55	1.37	8.03	1.80	.269	.01

Discussion-Conclusion

The initial evidence of the self-efficacy instrument's factorial validity was good. CFA produced acceptable goodness-of-fit indices, both for the full version and for the shortened version of the instrument (Hu & Bentler, 1999). These finfings support the multidimensional character of the newly constructed instrument and its usefulness for the most acurate investigation of PE teachers sense of efficacy towards the recently introduced curriculum. Furthermore, external construct validity was supported by the relationships that were found between total self-efficacy and teachers' achievement

goals. Expectedly, mastery goal orientation was positively related with teaching efficacy, and performance avoidance goal was unrelated to teaching efficacy which is consistent to previous research findings (Christodoulidis, 2004; Gorozidis & Papaioannou, 2011). Also, performance approach goal orientation did not relate to teaching efficacy to implement end-in-itself curriculum aims. This finding might seems inconsistent with our previous study showing a low positive significant relationship; on the other hand, as a part of the structural model predicting curriculum implementation, performance approach goal had no direct effect on self-efficacy towards end-in-itself curriculum aims (Gorozidis & Papaioannou, 2011). In addition, Christodoulidis (2004) also reported null relationships between personal teaching efficacy and performance approach goals.

The present results provide promising evidence supporting the validity and reliability of this new instrument. This kind of measurement may prove useful in monitoring physical educators' self-efficacy regarding the latest PE curriculum reform. Because instrument development is a process, it is recommended in future studies to use it in combination with other well established measures of psychological constructs, and also longitudinally to reveal any improvements or fluctuations in teaching efficacy during training and implementation of educational innovations.

Means and standard deviations inspection revealed that participants PE teachers held relatively high self-efficacy beliefs to implement most of the standards. This finding might be partly ascribed to teachers' ignorance of what exactly means to pursue these educational aims, how it can be evaluated, and what is required for the attainment of these standards. Indeed, in private conversations with some of the teachers, and after listening to their views during training it appeared that they have some misconceptions relevant to some of the standards, and they did not have the appropriate experience or the proper knowledge on how to achieve them in practice.

Relevantly, it has been suggested that the last PE curriculum reform in Greece has not been adopted and implemented satisfactorily (Gorozidis & Papaioannou, 2010, 2011; Gorozidis et al., 2011), which might be partly ascribed in teachers' self-efficacy beliefs. Therefore the examination of teachers' self-efficacy levels is very important in order to detect the specific parts of the curriculum that teachers might perceive themselves less efficacious. This will reveal the curriculum standards in which teachers feel inefficacious to implement successfully. This kind of knowledge

might be used constructively by policy makers aiming to foster and improve teachers' self-efficacy towards the new curriculum's core aims.

According to Bandura (1997) the basic sources of self-efficacy are *enactive mastery experiences, vicarious experiences* (modeling)*, verbal persuasion* (social influences)*,* and *physiological and affective states*. The most influential information that builds personal efficacy stems from individual experiences and its accompanying emotional-physiological arousal (Bandura, 1997). Based on this postulate the present results regarding differences, are explained next. Teachers' efficacy to develop students motor and sports skills (Std.1), was found to be in high degree, which was expected since this aim focuses on one of the most fundamental aims of the old PE curriculum still in use. Also, in high levels appeared to be their efficacy to develop sociability, self-expression and positive experiences from sports participation (Std.4). This can also be explained by the structure of the previous curricula where the prevalent teaching contents were team sports and traditional dances that are considered enjoyable and important means to promote sociability, self-expression and satisfaction of students. Teachers' past experiences might have made them highly efficacious with regard to the specific aims.

In contrast, teachers' efficacy in developing students' fitness level for health through the promotion of their exercise self-regulation (Std.3) was found to be the lowest. This finding is consistent with previous results where PE teacher presented relatively low scores in their self-efficacy to foster students' self-regulation in physical activity settings (Gorozidis & Papaioannou, 2011). It is very probable that their past attempts to achieve this goal confronted with many difficulties, such as students' attitudes, deficient prior knowledge, or curriculum structure. For instance, students accustomed to traditional PE lessons have never been taught or asked to set goals for out-of-school regular exercise, which they should try to fulfill by participating in outside the school physical activity settings. In addition, PE teachers' prior education with regard to this goal might be insufficient. Until the last fifteen years, University Departments of Physical Education and Sports Science in Greece were oriented towards sports coaching and university courses focusing on how to promote this curriculum aim (Std.3) were absent or limited. Hence, although this aim was also central in the old PE curriculum, due to insufficient former education teachers might have not been confident enough to implement this goal. Significantly, recent studies showed that Greek PE teachers are not accustomed to use student-

centered teaching styles such as, self-check, learners' individual designed program, learner initiated or self-teaching (Stephanou & Tsapakidou, 2008; Syrmpas & Digelidis, 2014). However, these teaching styles are the most appropriate to teach students how to improve their fitness level for health, and how to set and evaluate personal goals for regular physical activity (Std.3).

Furthermore, the relatively low levels of teaching efficacy in developing students' responsible sporting and social behavior (Std.6), and understanding-respect of peoples' diversity, promoting cooperation with everyone (Std.5), might be explained from the lack of previous teaching experience on these curriculum purposes. Indeed, these aims even though present in the previous PE curriculum have never been central aims for PE and the emphasis traditionally was placed on the development of motor and sports skills. Hence it is very probable that PE teachers feel relatively incompetent due to limited experience in pursuing the specific educational goals. In addition to that, PE lessons in junior high school and also in the two last grades of primary school are provided only two times per week in the timetable of the *New school* reform. However, these grades, due to higher emotional and mental maturity of students, are considered the most suitable to focus on these aims. This situation might weaken teachers' efficacy who might feel restricted by the limited amount of time they have to pursue many new educational aims.

Differences between primary-secondary school teachers seem reasonable if we consider that environmental and students' differences exist across educational levels. Primary school PE teachers tended to be more efficacious to achieve all curriculum standards, with significantly higher scores in Std.1 (motor & sports skills) and Std.4 (positive experience from sports– sociability). Again, this evidence might be ascribed in the restricted PE timetable for secondary schools (2 times/week), contrary to primary school especially regarding the first four grades where the time allocation for PE is much more sufficient (4 times/week) in the new curriculum reform. Also, the new curriculum brought together a PE time allocation reduction (from 3 to 2 hours/week) for junior high school. This situation in conjunction with the increased number of the core educational aims might have caused confusion and frustration to secondary school PE teachers, generating self-limiting doubts on how to implement successfully more goals in less time. Additionally, these differences may be attributed to students' motivation to participate in PE classes, since junior high school students present generally lower scores than primary school students (Digelidis &

Papaioannou, 1999; Papaioannou, 1997). Students' decreased motivation has been found to be a barrier for PE teachers' self-efficacy beliefs (Martin & Kulinna, 2003); and past studies showed that teachers feel more efficacious when they teach cooperative students (e.g., Newmann, Rutter, & Smith, 1989). Therefore, it seems plausible that in general junior high school teachers, who have to teach less motivated students, feel less efficacious than primary school teachers.

Relative to the differences which have been found between men and women we should be cautious. Currently, women tended to be more efficacious than men in all curriculum aims, but most significantly towards Std.2 (knowledge acquisition from sports science), Std.4 (positive experience from sports– sociability), and Std.6 (responsible sporting and social behavior). Probably, women already have been implemented the specific curriculum aims more than their men counterparts, or they might have a natural inclination to teach cognitive, emotional and behavioral goals. However, this explanation needs further research to be supported or not because previous studies did not provide similar evidence. For instance, in our past study Greek PE teachers did not presented differences in their efficacy to implement the old curriculum (Gorozidis, 2009; Gorozidis & Papaioannou, 2011). In addition, in another Greek based study relative to the implementation of a PE innovative program namely *Kallipatira,* it was found that men held higher self-efficacy than women at the end of their training (Kefallinou-Tzinieri, 2009). These inconsistencies may rise because of the different contents of the curriculua examined in these studies, jointly with teachers' previous experiences. Hence, no safe conclusion can be drawn without further investigating the subject of self-efficacy gender differences.

Educational studies have demonstrated that more efficacious teachers are more likely to adopt and implement successfully any promoted educational change (Ghaith & Yaghi, 1997; Gorozidis & Papaioannou, 2011; Guskey, 1988). Moreover, it has been supported that teacher efficacy can be fostered by their participation in appropriately designed training programs (Martin, McCaughtry, & Kulinna, 2008; Martin, McCaughtry, Kulinna et al., 2008; Martin et al., 2009; Shechtman, Levy, & Leichtentritt, 2005). Obviously, systematic training of teachers can be a fundamental productive source of personal teaching efficacy. Thus, it is very important for teachers' self-efficacy perceptions and the adoption of instructional innovations, to decide participating regularly in training programs provided to introduce these educational novelties. In relation, the previous section (5.2) of this chapter suggests

that teacher mastery goal orientation should be cultivated and fostered to achieve teachers' optimal engagement with innovation and training. The present finding, that total self-efficacy is positively linked with teacher mastery goal orientation supports this argument.

In brief, the findings of this study suggest that when authorities planning to introduce educational innovations, it would be useful to design training programs targeting to enhance individual teachers' self-efficacy beliefs, concurrently with their optimal motivation to participate and engage with teaching novelty.

Specifically, future programs should incorporate teachers' efficacy enhancement in their central scopes. This can be achieved by initially exploring the level of teachers' efficacy in each basic goal of the curriculum (distributing the questionnaire before the training), next based on teachers' capability beliefs the program should be designed primarily to foster teacher efficacy in curriculum aims that they feel less efficacious. At the end of the program teacher self-efficacy levels should be assessed again to evaluate the effectiveness of the training. Thus, training should emphasize, at least initially, curriculum aims attainment where teachers' believe they have weaknesses. If differences exist across groups, then training should be provided according to the needs of each group.

According to Bandura (1997) the basic sources of self-efficacy are *enactive mastery experiences*, *vicarious experiences* (modeling)*, verbal persuasion and allied types of social influence, and physiological and affective states*. Thus, in the training stage teachers firstly need to observe other teachers applying curriculum goals. Secondly, they need to implement the same goals and subsequently to observe and evaluate their attempts/performance. Thirdly, to evaluate and manage their emotional arousal and physiological states while they have these teaching experiences. Fourthly, during this process continuous corrective non-threatening feedback, guidance and encouragement are necessary to provide teachers the appropriate conditions to experience mastery in teaching the new curriculum. Then, having these enactive mastery experiences it would be more probable their efficacy to be enhanced and to follow this kind of teaching. The reason is because mastery experiences are the most powerful sources of efficacy since they provide authentic evidence of teacher capability to master the task in hand (Bandura, 1997)

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Chapter VI GENERAL DISCUSSION AND CONCLUSIONS

In total, the empirical findings presented above align with the notion that educators' motivational qualities (i.e., dispositions, regulations) are key determinants of their involvement with educational innovations. The principal objective of the present PhD research project was to decipher and convincingly explain educators' motivation and intentions with regard to educational innovations. Founded on two prominent theories of motivation SDT and AGT, the study followed a complex multiphase mixed methods design (see Chapter III) where multiple independent samples, and types of data were used to credibly answer three overarching research questions:

1. Why do some individuals decide to participate in training aiming to promote educational innovation?
2. Why are some educators more engaged with educational innovations?
3. How this involvement with instructional innovation might be fostered?

For reasons of parsimony the convergence of findings will be presented with regard to these general research questions.

6.1 Summary of findings

6.1.1 Why do some individuals decide to participate in training aiming to promote educational innovation?

Firstly, to answer this question a qualitative study with youth football coaches was conducted (Gorozidis, Tzioumakis, Papaioannou, & Krommydas, 2014). This study showed that SDT can provide the theoretical framework to sufficiently interpret coaches' participatory motivation in training promoting innovative instruction. Most importantly, coaches reported that they have decided to participate in the program mostly for autonomous reasons, whereas some controlled motivations existed but in a much smaller degree. Secondly, the same question was examined both qualitatively and quantitatively with a sample of in-service secondary school teachers and confirmed that when participation is optional, educators are highly autonomously motivated to engage with training promoting educational innovation, while some controlled motivations also existed in their mind (Gorozidis & Papaioannou, 2014).

Thirdly, this finding was replicated quantitatively with a sample of physical educators who took part in a mandatory training program aiming to promote a new innovative PE curriculum. These educators, like teachers, scored much higher in autonomous than in controlled motivations to participate in training (Gorozidis & Papaioannou, 2015). In similar vein, pre-service PE teachers who participated in a compulsory course (practicum module) promoting innovative teaching, scored significantly higher in autonomous (intrinsic, identified) than in controlled regulations (introjected, external) (Gorozidis & Papaioannou, 2012). One may argue here that when participation in training is coerced the reason for participation is exactly this, the obligation of individuals to do the task. However, it seems that irrespective of the condition under which people participate in training, they tend to internalize external drives maybe subconsciously, in order to feel more self-determined and to fulfill their innate need for autonomy.

Previous research in this area has not examined the reasons for participation in professional training through the lenses of SDT or under different conditions of recruitment (i.e., mandatory vs. optional participation). However, a closer look to the findings of past studies in various countries align with ours, and suggest that teachers (e.g.,Hynds & McDonald, 2009; Livneh & Livneh, 1999) and other professionals (e.g., Dia, Smith, Cohen-Callow, & Bliss, 2005; Garst & Ried, 1999) participate in continuous education primarily for autonomous reasons, but also for some controlling reasons. Interestingly, while controlled motivation may have been important for teachers' decisions, only autonomous motivation predicted their intention for future participation in similar training (Gorozidis & Papaioannou, 2014). This finding is very significant because intention is considered a major determinant of behavior (Ajzen & Fishbein, 1980), and implies that controlling motivations, provided by policy makers in order to promote participation in training, would have no effect on teacher's intentions when seize to exist. On the other hand, autonomous reasons for engagement seem very probable to motivate educators to participate in future relevant training, which is essential for the continuation of educational innovations. Furthermore, it appeared that a strong mastery goal orientation would be beneficial for teachers' autonomous motivation and their future intentions to get involved with innovations.

6.1.2 Why are some educators more engaged with educational innovations?

This research question goes beyond the decision of educators to participate in training, and investigates their volition to try implementing innovative instruction in every day practices. It was found that teachers' autonomous motivation (contrary to controlled) not only determines their participation in training but also their further engagement with innovation. It appeared that teachers' motivation to implement innovation is mainly dependent on intrinsic and well internalized extrinsic reasons, because only autonomous motivation was sufficient to predict intention to teach innovative subject. At the same time teachers who have implemented innovation indicated significantly higher scores in autonomous than in controlled motivation to teach innovatively (Gorozidis & Papaioannou, 2014, 2015).

In the examination of individual dispositions that determine educators' courses of action, achievement goals (i.e., mastery, performance approach & avoidance) were assessed. Teachers' autonomous motivation was significantly linked only with mastery goal orientation (contrary to both performance goals) irrespective of the recruitment condition of participation in training (mandatory vs. optional), whereas controlled motivation was positively connected only to performance goal orientations (approach and avoidance) (Gorozidis & Papaioannou, 2015; Study 1). As expected, these relationships were already evident from the Study 2-Pilot 1 with the sample of pre-service PE teachers (Gorozidis & Papaioannou, 2012). Most importantly, it was found that mastery oriented teachers tended to be more autonomously motivated and had the intention to future implement innovation, contrary to performance oriented teachers (both approach and avoidance) who were more controlled motivated and with no intention to teach innovation next year (Gorozidis & Papaioannou, 2015; Study 2). The finding that only mastery goal orientation was positively linked with autonomous motivation irrespective of the condition of recruitment or the task in hand, underline the importance of teachers' mastery goal enhancement.

Last but not least, the empirical evidence suggests that different tasks and situations involving educational innovations have been very attractive to mastery oriented and autonomously motivated educators. On the other hand, these innovation relevant tasks (i.e., training participation, implementation) may have been attractive for controlled motivated and performance oriented individuals too, but not in the sufficient degree to sustain and enhance their intentions to get engaged with novelty in

the future. All these findings hide important implications for policy and practice aiming to foster educators' participation in professional training and their long term involvement with educational innovation. These implications concern the formation of the appropriate educational environments for teachers and are discussed next.

6.1.3. How involvement with instructional innovation might be fostered? Implications-Suggestions

Empirical evidence in conjunction with literature reviews (e.g., Gorozidis & Papaioannou, 2011a) reported in this PhD research solidly supports the applicability of SDT and AGT in the specific situation and context. This means that theoretical suggestions of SDT and AGT for the basic characteristics of optimal learning environments should be considered major priority to be met. Based on the hierarchical models developed in SDT and AGT frameworks, it is suggested that in order to foster teacher involvement with instructional innovation, firstly quality of motivation (autonomous motivation and mastery goal orientation) should be targeted in a more broad level of generality as the work domain (i.e., teacher work in general), and subsequently to focus on more specific situations and tasks at the situational level of generality (i.e., participation in training, implementation of educational innovation).

According to SDT in order to foster teachers' self-determination in work and specifically with regard to educational innovation, the three innate organismic needs of autonomy, competence and relatedness must be satisfied by the professional environments they operate in. Indeed, Gagne´ and Deci (2005) suggested that work environments supportive for employee basic needs, lead to increased intrinsic motivation and facilitate the internalization process of external motivations. Interestingly, with regard to school innovations it has been found that the basic needs for autonomy, competence and relatedness can impact teachers' autonomous contrary to controlled motivation (Schellenbach-Zell & Gräsel, 2010). Similarly, it has been reported that teacher motivation to implement innovation may be predicted by the three basic supportive dimensions of school environments, that is autonomy, competence and collegial support (Lam, Cheng, & Choy, 2010). In addition, a recent study demonstrated that teachers' work related mastery goal orientation was predicted by their perceptions that the school environment they work in fulfils their basic psychological needs for autonomy, competence, and relatedness (Janke, Nitsche, & Dickhäuser, 2015).

Educators' need for autonomy can be satisfied in autonomy supportive environments that provide teachers (a) meaningful rationale for the necessity of innovations, (b) opportunities to get actively involved with the formation of reform efforts, and (c) the choice to customize their training according to their needs and personal time, which is consistent with the suggestions for effective professional development programs (Armour & Yelling, 2004; O'Sullivan & Deglau, 2006). Teacher need for competence might be satisfied if their self-efficacy beliefs are strengthened (reinforced). This can be done (a) by observing other teachers implement innovation (vicarious experiences), (b) by having successful prior experiences of innovative teaching maybe through pilot projects (mastery experiences), and (c) by getting encouragement, feedback and guidance from colleagues and experts (verbal persuasion) (Deglau & O'Sullivan, 2006; Kulinna, McCaughtry, Martin, Cothran, & Faust, 2008; Martin, McCaughtry, & Kulinna, 2008; Martin, McCaughtry, Kulinna, & Cothran, 2009). For relatedness need fulfillment, teachers' collaboration and cooperation with colleagues, experts and officials might be essential for their professional development and training. If this combined effort is mutual and fair in nature, it is very probable to raise teacher sense of belongingness, to satisfy their need for relatedness and to foster their self-determination (Deci & Ryan, 1985). This can be achieved through the formation of collaborative teacher networks (or e-forums/networks), relevant to each innovation, where participants would have the opportunity to constantly communicate and share ideas about problems and solutions, during training and implementation of educational innovation. This participation in *professional communities of learning, teacher networks, discourse communities, and communities of practice* align with professional development literature and research underscoring the multiple benefits of these practices (Cochran-Smith & Lytle, 1999; Deglau, Ward, O'Sullivan, & Bush, 2006; Lieberman & Miller, 1999; Putnam & Borko, 2000).

In similar fashion, teacher mastery goal orientation must be cultivated and fostered not only when individuals being pre-service, but during their professional career (being in-service) as well. Teacher predisposition towards personal development and improvement can be encouraged and supported, if the general educational/professional framework they live and teach in, is carefully constructed to reflect the philosophy of a mastery/learning motivational climate, contrary to a performance one. Essentially, this climate may be established following the strategies

outlined above for the promotion of teachers' autonomous motivation, which is rather consistent with recent evidences that perceived needs satisfaction predicts teachers' work-related mastery goal orientation (Janke et al., 2015); and at the same time by emphasizing teacher personal improvement, effort, and persistence, and by providing freedom for constant experimentation with instructional innovations which should be followed by a corrective non-threatening feedback.

6.2 Limitations & Strengths

The focal point of this research project was educators' work specific motivational qualities relevant to educational novelty and its connection and prediction of behavioral intentions to engage with innovation in the future. While different samples, conditions, and tasks were examined and multiple sources of data were utilized such as self-reports, written interviews, face-to-face interviews (and some participant observation), no systematic observation of teachers' actual behavior were conducted to confirm the main findings of each study, and to examine teacher motivation with regard to the successful implementation of innovative teaching. Also, some theoretical hypotheses were examined with small sample sizes, or based primarily on cross-sectional data where causality in relationships cannot be inferred. To address these limitations sophisticated statistical techniques were utilized, while each assumption was supported by theoretical postulates and past research evidence. Additionally, triangulation process in data, theories and analysts that was followed during the whole research project, augments the credibility of the arguments made. In addition, the participants of each study were purposefully selected to meet certain criteria such as their actual involvement with tasks promoting innovation (i.e., training, teaching) in authentic settings. This condition strengthens the findings because a teacher having experienced the phenomenon of interest is the best sample to give insights on the reality, since his/her reports are based on meaningful, real-life tasks/situations and not on experimental conditions, uninteresting tasks and/or hypothetical scenarios.

Another limitation is that this PhD research did not focus on the quantity of educators' motivation (e.g., amotivation), or did not explore the barriers teachers face when decide to participate in training, or the hindrances they confront during implementing innovation. Nevertheless, according to SDT and AGT the psychological factors examined here (i.e., behavioral regulations, dispositional achievement goals), are sufficient to energize educators' actions helping them overcome any obstruction

they met, and to maintain intensity, persistence and direction of their intentional behaviors.

6.3 Future research avenues

A meaningful next step of this research would be to investigate how specific characteristics of different educational/work environments can influence educators' motivation, their actual behavior towards innovation, and the subsequent impact on student achievements. For example, in modern Greece there is a long lasting debate about accountability/evaluation system of educators and other public (or civil) servants, posing questions as (a) accountability or no accountability, (b) evaluation for what (improvement vs. dismissal), (c) evaluation associated with wages/payments or not? This debate in the current political events and reforms is more topical than ever. Therefore, it would be very interesting to study what the effect of the adoption and establishment of different accountability/evaluation systems is for educators, such as evaluation for improvement of a mastery/autonomy supportive environment versus to evaluation for punishment or material incentives of a performance/controlling professional climate.

Another purposeful line of research should be to target the interaction of various environmental/situational characteristics with employees' organizational-occupational commitment (Meyer & Allen, 1997) or other important personal factors such as self-efficacy (Bandura, 1997), which was examined in the future oriented study of the present PhD research. Indeed, it seems very promising to study educators' self-efficacy improvements or fluctuations during well designed training interventions and the subsequent implementation of instructional innovations; the self-efficacy instrument that we constructed in the last part, can serve to this direction. The basic assumption evolving here is that if teachers work in mastery oriented and autonomy supportive educational environments and they feel highly efficacious to implement innovations in every day practices, then it will be inevitable after a process of experimentation, evaluation and improvement to apply successfully these practices, bringing multiple benefits in students' life.

6.4 Main conclusions

Collectively, all empirical evidence advocates that the key variable for educators' involvement with innovation is their autonomous or self-determined motivation. Not only autonomous motivation predicted intentions to future participate in training and

to teach innovation, but it was also positively related with teacher mastery orientation and mediated its relationship with behavioral intention. Above that, all the different samples of educators who were involved with instructional innovation presented significantly higher proportions of autonomous motivation in comparison to controlled motivation. Interestingly, although controlled motivation may provide some obvious extrinsic reasons for engagement with an activity, it failed to predict teachers' intentions. In similar vein, performance approach and avoidance goals failed to account for autonomous motivation or intentions explanation and were only related to controlled motivation. The patterns of relationships between achievement goal orientations and motivational regulations were invariant across different teacher groups/conditions of recruitment (optional-mandatory).

These findings are especially important for the current practices implemented globally. Officials and policy makers in order to promote innovations are accustomed to establish controlling motivations (such as monetary incentives, evaluation, job promotion). This choice might be justified if the aim in education is the quantity and we naively assume that by engaging more people, independently of their type of motivation, we will have the expected long-term results. However it seems that for this kind of choices on how to promote educational innovation there is ***the easy way and the right way***. The *easy way* is to provide controlling incentives in order to have fast and measurable quantitative results with questionable quality and waiting to see if the long term goals will have been achieved. Nevertheless, based on the evidence most probably this policy will lead to superficial and temporal results. The *right way* founded on the present findings, theory and past research is to provide the appropriate environment, supporting teachers' mastery and promoting their self-determined motivation in work. This policy might be difficult to implement under certain circumstances (political uncertainty, successive reforms without a long term acceptance and an agreed basic plan) because it might entail the general restructuring of the whole educational system and its philosophy. Baring that in mind, theoretical tenets of motivational theories such as SDT and AGT should not be overlooked, when authorities and administrators design in-service training programs and educational environments for teachers' optimal functioning.

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APPENDIX I

Research Permission from the Ethics Committee of the University of Thessaly

ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΙΑΣ
ΤΜΗΜΑ ΕΠΙΣΤΗΜΗΣ ΦΥΣΙΚΗΣ ΑΓΩΓΗΣ ΚΑΙ ΑΘΛΗΤΙΣΜΟΥ

Εσωτερική Επιτροπή Δεοντολογίας

Τρίκαλα: 29/3/2012
Αριθμ. Πρωτ.:506

Αίτηση Εξέτασης της πρότασης για διεξαγωγή Έρευνας με τίτλο: «Παρακίνηση εκπαιδευτικών και προπονητών στην συμμετοχή τους σε επιμορφωτικά προγράμματα για την εφαρμογή εκπαιδευτικών καινοτομιών.»

Επιστημονικός υπεύθυνος / επιβλέπων: Παπαϊωάννου Αθανάσιος
Ιδιότητα: Καθηγητής
Ίδρυμα: Πανεπιστήμιο Θεσσαλίας
Τμήμα: Τ.Ε.Φ.Α.Α

Κύριος ερευνητής / φοιτητής: Γοροζίδης Γεώργιος
Πρόγραμμα Σπουδών: Διδακτορικός Κύκλος Σπουδών
Ίδρυμα: Πανεπιστήμιο Θεσσαλίας
Τμήμα: Τ.Ε.Φ.Α.Α

Η προτεινόμενη έρευνα θα είναι:

Ερευνητικό πρόγραμμα ☐ Μεταπτυχιακή διατριβή ☐ Διπλωματική εργασία ☐ Διδακτορική έρευνα ☒

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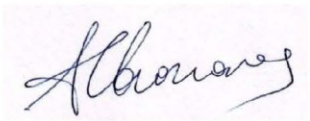
Η Εσωτερική Επιτροπή Δεοντολογίας του Τ.Ε.Φ.Α.Α., Πανεπιστημίου Θεσσαλίας μετά την υπ. Αριθμ. 5-1/22-2-2012 συνεδρίαση της εγκρίνει τη διεξαγωγή της προτεινόμενης έρευνας.

Ο Πρόεδρος της
Εσωτερικής Επιτροπής
Δεοντολογίας – ΤΕΦΑΑ



Τσιόκανος Αθανάσιος
Αναπληρωτής Καθηγητής

APPENDIX II

Participants' inform consent forms according to the standards of the Ethics Committee of the University of Thessaly

Έντυπα συναίνεσης

ΣΥΓΚΑΤΑΘΕΣΗ

Ο υπογράφων……συμφωνώ να συμμετάσχω στην έρευνα που διεξάγεται από τον υποψήφιο διδάκτορα του ΤΕΦΑΑ του Πανεπιστημίου Θεσσαλίας Γοροζίδη Γεώργιο. Γνωρίζω ότι κανένα είδος ζημιάς δεν πρόκειται να υποστώ συμμετέχοντας και κατανοώ ότι οι πληροφορίες θα χρησιμοποιηθούν για ερευνητικούς σκοπούς. Έχω επίσης υπόψη μου ότι έχω το δικαίωμα να διακόψω την συμμετοχή μου οποιαδήποτε στιγμή το επιθυμήσω.

……../……/…2011

Υπογραφή

ΒΕΒΑΙΩΣΗ

Με το παρόν βεβαιώνεται ότι κανένα είδος ζημιάς δεν θα υποστούν οι συμμετέχοντες στην παρούσα συνέντευξη, η οποία γίνεται για ερευνητικούς σκοπούς. Όλες οι πληροφορίες που θα χρησιμοποιηθούν θα είναι ανώνυμες και απόλυτη εχεμύθεια θα διατηρηθεί για το περιεχόμενο της συνέντευξης. Σε οποιαδήποτε στιγμή μπορείτε να διακόψετε την συμμετοχή σας στην έρευνα, εάν το επιθυμείτε. Μπορείτε επίσης ελεύθερα να βλέπετε όλα όσα γράφονται σε αυτήν την εργασία οποιαδήποτε στιγμή το επιθυμείτε. Τέλος εάν θέλετε αντίτυπο της τελικής εργασίας υπάρχει δυνατότητα να το προμηθευτείτε όποτε το ζητήσετε.

……../……./..2011

Ευχαριστώ για την συνεργασία

Γοροζίδης Γεώργιος

APPENDIX III

Original Publications - Sample Pages

Publication 1

Γοροζίδης, Γ., & Παπαϊωάννου, Α. (2011). Η σημασία του αυτό-καθορισμού των εκπαιδευτικών στα προγράμματα επιμόρφωσής τους: Η περίπτωση των εκπαιδευτικών φυσικής αγωγής. *Επιθεώρηση Εκπαιδευτικών Θεμάτων, 17, 273-298. Παιδαγωγικό Ινστιτούτο, Αθήνα.*

Η σημασία του αυτο-καθορισμού των εκπαιδευτικών στα προγράμματα επιμόρφωσής τους: η περίπτωση των εκπαιδευτικών φυσικής αγωγής

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Παπαϊωάννου Αθανάσιος, *Πανεπιστήμιο Θεσσαλίας*

Περίληψη

Σκοπός της παρούσας ανασκόπησης ήταν η μελέτη των σύγχρονων προγραμμάτων επαγγελματικής ανάπτυξης των εκπαιδευτικών διεθνώς. Επικεντρώνοντας στον κλάδο των Εκπαιδευτικών Φυσικής Αγωγής, έγινε προσπάθεια διερεύνησης των βασικών χαρακτηριστικών που μπορούν να μετατρέψουν τα προγράμματα επιμόρφωσης των εν-ενεργεία εκπαιδευτικών σε αποτελεσματικές εμπειρίες μάθησης και αλλαγής. Φαίνεται ότι, υπό το πρίσμα της θεωρίας του Αυτό-καθορισμού (Deci & Ryan, 1985), μπορούν να σχεδιαστούν ενδοϋπηρεσιακά προγράμματα επιμόρφωσης που θα προάγουν τις εσωτερικές ψυχολογικές ανάγκες των ατόμων για αυτονομία, κοινωνικές σχέσεις και επάρκεια. Τέτοιου είδους προγράμματα έχουν σημαντικές πιθανότητες να επιφέρουν ουσιαστικές και μακροχρόνιες βελτιώσεις στη διδακτική συμπεριφορά των εκπαιδευτικών και στη ζωή των μαθητών.

Λέξεις κλειδιά: Επαγγελματική ανάπτυξη εκπαιδευτικών, Αυτό-καθορισμός.

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Publication 2

Gorozidis, G., Tzioumakis, Y., Papaioannou, A. G., & Krommydas, C. (2014). *Youth football coaches' self-determination to participate in professional training promoting innovative/empowering coaching.* Paper presented at the 13th Conference of Sport Psychology, "Psychology in Sports and Education", Trikala, Greece.

Youth football coaches' self-determination to participate in professional training promoting innovative/empowering coaching.

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Abstract

The purpose of this study was to investigate youth football coaches' motivation to participate in an innovative training program. Fifteen coaches, participants of the *PAPA project* in Greece, were individually interviewed in order to give insights about the reasons why they decided to engage in this program. Guided from a prominent theory of human motivation, self-determination theory (SDT; Deci & Ryan, 1985; 2002), analyses of the qualitative data revealed that coaches were highly autonomously motivated regarding their participation in training, while controlling behavioural regulations existed in a much smaller extent in their sayings. It seems that the application of the theoretical foundation employed in this study can provide the appropriate lenses to explain coaches' motivation to participate in professional training. Enhancing the quality of coaches' learning motivation seems a wise tactic to foster the quality of coaching provision in youth football and SDT may provide useful guidelines to this direction.

Introduction

Coach behaviour and practice have a substantial impact on young athletes' motivation, achievement, their psychosocial development and well-being (Conroy & Coatsworth, 2007; Cushion, Ford, & Williams, 2012; Mageau & Vallerand, 2003; Newton & Duda, 1999). Although there is an ample body of research on motivation concerning sport participants (Roberts, 2001) or other professionals (Gagne´ & Deci, 2005), coaches' motivation literature seems to be limited (Jowett, 2008; McLean & Mallett, 2011; McLean, Mallett, & Newcombe, 2012),and the subject of coach motivation to participate in learning has often been neglected (Cushion et al., 2010). To our knowledge there are only few studies addressing this important subject (e.g., MORI, 2004; Vargas-Tonsing, 2007), which are not theory based or driven.

Coaching is a very demanding and complex professional endeavour (Cushion, 2007). Giges, Petitpas and Vernacchia (2004) pointed out that coaches are required to play the multiple roles of teacher, parent, mentor, leader, manager, and performer. These professional demands together with the amount of people affected by them, makes coaches' continuing

Publication 3

Gorozidis, G., & Papaioannou, A. (2012). Initial validation of the "Work Tasks Motivation Scale for Teachers" - Greek version (WTMST-GR). Paper presented at the the 20th International Conference of Physical Education and Sports, Democritus University of Thrace-D.P.E.S.S. (Short papers, Section: Sports Psychology, pp. 3-7), Komotini, Greece.

ΑΡΧΙΚΗ ΜΕΛΕΤΗ ΕΓΚΥΡΟΤΗΤΑΣ ΤΗΣ ΚΛΙΜΑΚΑΣ «ΠΑΡΑΚΙΝΗΣΗ ΣΕ ΕΠΑΓΓΕΛΜΑΤΙΚΑ ΚΑΘΗΚΟΝΤΑ ΓΙΑ ΕΚΠΑΙΔΕΥΤΙΚΟΥΣ»

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Περίληψη

Η παρακίνηση των εκπαιδευτικών σχετικά με τα καθήκοντα τους είναι πρωταρχικής σημασίας για την ποιότητα της δουλειάς τους. Στην ελληνική γλώσσα υπάρχει έλλειψη έγκυρων και αξιόπιστων εργαλείων μέτρησης της αυτό-καθοριζόμενης παρακίνησης των εκπαιδευτικών σε επίπεδο κατάστασης. Ο σκοπός της παρούσας εργασίας ήταν η μελέτη της παραγοντικής εγκυρότητας και εσωτερικής συνοχής της κλίμακας «Παρακίνηση σε Επαγγελματικά Καθήκοντα για Εκπαιδευτικούς» (Fernet, Senecal, Guay, Marsh, & Dowson, 2008). Η μετάφραση και προσαρμογή του ερωτηματολογίου για τον ελληνικό πληθυσμό έγινε από δυο ειδικούς στον τομέα της παρακίνησης εκπαιδευτικών. Συμμετέχοντες ήταν 52 τεταρτοετείς φοιτητές (29 άνδρες, 23 γυναίκες) από τα ΤΕΦΑΑ-Θεσσαλίας που συμμετείχαν στο μάθημα Πρακτική στα σχολεία. Το αρχικό εργαλείο απαντάται σε 7-βάθμια κλίμακα τύπου Likert και αποτελείται από 5 παράγοντες-ρυθμίσεις της συμπεριφοράς του φάσματος της θεωρίας του Αυτό-καθορισμού (εσωτερική παρακίνηση, αναγνωρίσιμη ρύθμιση, εσωτερική πίεση, εξωτερική ρύθμιση, μη-παρακίνηση), με 3 ερωτήματα ανά παράγοντα. Η επιβεβαιωτική παραγοντική ανάλυση υποστήριξε την δομή του ερωτηματολογίου αναπαράγοντας τους δείκτες της πρωτότυπης έκδοσης. Η ανάλυση αξιοπιστίας έδωσε ικανοποιητικούς δείκτες α του Cronbach για όλες τις υπο-κλίμακες. Η εξωτερική δομική εγκυρότητα μελετήθηκε μέσω των συσχετίσεων των ρυθμίσεων της συμπεριφοράς, με τους προσανατολισμούς στόχων επίτευξης των εκπαιδευτικών, και έδωσε συσχετίσεις αναμενόμενες, βάση των θεωριών και προηγούμενων ερευνών. Συνολικά τα αποτελέσματα των αναλύσεων έδωσαν ικανοποιητικά στοιχεία για την εγκυρότητα και αξιοπιστία της ελληνικής έκδοσης του ερωτηματολογίου και υποστήριξαν τις ψυχομετρικές του ιδιότητες. Τέτοια εργαλεία μπορεί να αποδειχθούν πολύ χρήσιμα στην διερεύνηση της παρακίνησης των εκπαιδευτικών Φυσικής Αγωγής σε σημαντικά επαγγελματικά τους καθήκοντα (πχ, συμμετοχή σε επιμορφωτικά προγράμματα) που μπορεί να επηρεάσουν την ποιότητα της δουλειάς τους.

Λέξεις κλειδιά: *Αυτό-καθορισμός, καθήκοντα εκπαιδευτικών, επιβεβαιωτική παραγοντική ανάλυση*

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INITIAL VALIDATION OF THE "WORK TASKS MOTIVATION SCALE FOR TEACHERS" - GREEK VERSION (WTMST-GR)

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Abstract

Teachers' motivation regarding the many different tasks they have to carry out is essential for the quality of teaching and their working behavior. In Greek context there is a lack of valid and reliable instruments measuring teachers' self-determined situational motivation. Thus, the purpose of this study was to evaluate the factorial validity and internal consistency for the Greek version of the Work Tasks Motivation Scale for Teachers (WTMST; Fernet, Senecal, Guay, Marsh, & Dowson, 2008). The translation (back to back translation) and adaptation of the instrument for the

Publication 4

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Teachers' motivation to participate in training and to implement innovations

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HIGHLIGHTS

- Self-determination theory is beneficial in understanding teachers' work motivation.
- Autonomous motivation predicts teachers' intentions to participate in training.
- Autonomous motivation predicts teachers' intentions to teach an innovative subject.
- Controlled motivation does not predict teachers' intentions.

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ABSTRACT

Based on Self-determination theory, a mixed method design was used to explore 218 teachers' motivation and intentions regarding participation in training and teaching of an innovative academic subject (i.e., *Research Project*). Structural equation modeling revealed that autonomous motivation positively predicted teacher intentions to participate in relevant training and to implement innovation in the future, while controlled motivation did not. The findings imply that policy makers should encourage strategies that foster teacher autonomous motivation for promoting successful implementations of educational innovations.

1. Introduction

In recent years, school innovations have become increasingly important for worldwide reforms in an attempt to improve education and to switch from traditional teaching practices (teacher-centered) to more creative student-centered approaches (e.g., cooperative, project-based learning). A notable example is Greece where many top-down reform efforts have been made in the last ten years in an attempt by the Ministry of Education to improve education and to align national curricula with international trends (e.g., Cross Thematic Curriculum, 2003; New books, 2006; New School-Priority the student, 2011). In the most recent educational change, an innovative new course namely *Research Project*, was introduced to Greek high schools (10th to 12th grade) (http://www.pi-schools.gr/; http://www.minedu.gov.gr/). This is based on four pedagogical principles, (a) Inquiry based learning, (b) Interdisciplinary teaching-collaboration, (c) Differentiated learning, (d) Cooperative learning (Ministry of Education, 2011). The new subject requires students to work on interdisciplinary projects in small groups, and teachers to facilitate initiative, choice, experimentation, and individual/group responsibility (Ministry of Education, 2011). In Greece, apart from inductive training, further in-service education is not obligatory; in this context the first act was to support the implementation of this innovative subject by way of an optional in-service training program for high school teachers, provided by The National Organization for Teachers' Training (i.e., OEPEK) in June of 2011.

In the international educational arena, innovations are often introduced via centrally organized in-service teacher training programs (or continuous professional development programs). However, in many cases, participation in these programs is optional, and when it is mandatory there is no way of ensuring

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Publication 5

Gorozidis, G., & Papaioannou, A. (submitted). Teachers' achievement goals and self-determination to engage in work tasks promoting educational innovations.

Teachers' achievement goals and self-determination to engage in work tasks promoting educational innovations

Abstract

Teachers' motivation determines the adoption and effective implementation of school innovations. The main objective of this research was the investigation of the patterns of relationships between teachers' achievement goals and their self-determined motivation to get involved with work tasks promoting innovations (i.e., participation in training, implementation of new practices). Participants were (a) 276 teachers who were involved in training about innovations, divided into two groups according to the condition of their recruitment (i.e., optional, n =191 vs. mandatory, n =85; Study 1); and (b) 140 teachers who implemented educational innovation at school (Study 2). Teachers' achievement goals, self-determination and intentions were responded to questionnaires with good psychometric properties. Hypotheses were tested using structural equation modeling. Analyses in Study 1 revealed that only mastery goal was positively linked with teachers' autonomous motivation, while performance avoidance goal was positively linked with their controlled motivation to participate in training and these patterns were invariant across teacher groups-conditions. Study 2 showed that mastery goal orientation had an indirect effect on intentions to implement innovation, and this relationship was fully mediated by autonomous motivation to teach innovation. None of the performance goals was linked with intention, and only performance approach goal was positively linked with controlled motivation to implement innovation. These findings suggest that teachers' mastery goals and autonomous motivation should be promoted in order to foster teachers' optimal engagement with educational innovations.

Keywords: Mastery goal orientation, performance goal orientations, autonomous motivation, controlled motivation, teaching innovation

Publication 6

Γοροζίδης, Γ., Παπαϊωάννου, Α. & Διγγελίδης, Ν. (2012). Αυτό-αποτελεσματικότητα εκπαιδευτικών φυσικής αγωγής στην εφαρμογή του νέου προγράμματος σπουδών για το «Νέο Σχολείο - Σχολείο 21ου αιώνα». *Αναζητήσεις στη Φυσική Αγωγή & τον Αθλητισμό, 10*(2), 91-101.

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Αυτο-αποτελεσματικότητα Εκπαιδευτικών Φυσικής Αγωγής στην Εφαρμογή του Νέου Προγράμματος Σπουδών για το «Νέο Σχολείο -Σχολείο 21ου Αιώνα»

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Περίληψη

Σκοπός της παρούσας έρευνας ήταν να μελετηθεί η αντιλαμβανόμενη αυτό-αποτελεσματικότητα των Εκπαιδευτικών Φυσικής Αγωγής (ΕΦΑ), σε σχέση με τους έξι κεντρικούς σκοπούς (Σκ.) του νέου προγράμματος σπουδών (ΠΣ) δημοτικού και γυμνασίου, που εισήχθη πιλοτικά κατά το σχολικό έτος 2011-2012 σε 167 σχολειά πανελλαδικά. Στην έρευνα συμμετείχαν 92 ΕΦΑ (48 άνδρες, 44 γυναίκες/ 53 δημοτικό, 39 γυμνάσιο) από τα πιλοτικά σχολεία. Οι ΕΦΑ συμπλήρωσαν εθελοντικά, ανώνυμα ερωτηματολόγια που μετρούσαν την πεποίθησή τους για την αποτελεσματική εφαρμογή των έξι βασικών σκοπών του νέου ΠΣ. Οι έξι κλίμακες (μια ανά σκοπό), έδειξαν ικανοποιητική αξιοπιστία με υψηλούς δείκτες α του Cronbach (α > .70). Από τις αναλύσεις φαίνεται ότι οι ΕΦΑ έχουν σχετικά υψηλή αυτό-αποτελεσματικότητα στο να εφαρμόσουν τους περισσότερους σκοπούς του νέου ΠΣ. Ωστόσο, η ανάλυση διακύμανσης επαναλαμβανόμενων μετρήσεων μονής κατεύθυνσης (one-way RM-ANOVA) έδειξε ότι υπήρχαν διαφορές ως προς την αυτό-αποτελεσματικότητα στην εφαρμογή των έξι σκοπών. Επιπλέον από πολυμεταβλητές αναλύσεις διακύμανσης (MANOVA) φάνηκε ότι υπήρχαν διαφορές ως προς το φύλο όπου οι γυναίκες παρουσίασαν ψηλότερες τιμές και ως προς τον τύπο σχολείου, όπου οι εκπαιδευτικοί που υπηρετούν σε Δημοτικά Σχολεία είχαν υψηλότερη αυτό-αποτελεσματικότητα σε σύγκριση με τους καθηγητές που υπηρετούν στη Β/θμια Εκπαίδευση. Από τα αποτελέσματα φάνηκε ότι η αυτοπεποίθηση των ΕΦΑ ήταν χαμηλότερη στο να αναπτύξουν την φυσική κατάσταση μέσω της αυτορρύθμισης των μαθητών τους (Σκ. 3), την επίδειξη υπεύθυνης αθλητικής και κοινωνικής συμπεριφοράς (Σκ. 6) και την κατανόηση και το σεβασμό της διαφορετικότητας των ατόμων (Σκ. 5). Φάνηκε ότι οι ΕΦΑ έχουν ανάγκη από στοχευμένη βελτίωση της αυτό-αποτελεσματικότητας τους, μέσω επιμόρφωσης, σχετικά με συγκεκριμένους σκοπούς του νέου ΠΣ, ενώ πρέπει να ληφθούν υπόψη η βαθμίδα εκπαίδευσης και το φύλο τους.

Λέξεις κλειδιά: *Αυτό-αποτελεσματικότητα, Φυσική Αγωγή, αναλυτικό πρόγραμμα*

Physical Educators Self-efficacy in the Implementation of the New Curriculum for the "New School- the School of the 21st century"

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Abstract

Educational studies have been shown that teachers' self-efficacy beliefs are essential determinants of the teaching outcomes and very important factors for the adoption of any reform effort. The scope of the present study was to examine Physical Education (PE) teachers' self-efficacy in teaching the six basic standards (Std.) of the new national PE curriculum. As a part of the reform effort "New School- the school of the 21st century", the new curriculum

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Publication 7

Gorozidis, G., Papaioannou, A. G., Diggelidis, N., & Syrbas, I. (2014). Validation evidence of the scale "self-efficacy in teaching physical education curriculum standards". Paper presented at the 13th Conference of Sport Psychology, "Psychology in Sports and Education" (pp. 147-151), Trikala, Greece.

Validation evidence of the scale "self-efficacy in teaching physical education curriculum standards.

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Abstract

Research in education consistently shows that teachers' self-efficacy beliefs are instrumental for their teaching behavior and students' achievement. Teachers' self-efficacy towards the successful implementation of curriculum goals and standards may determine the acceptance or rejection of curriculum various parts. Thus, self-efficacy assessment seems very important for the design of teacher training and the adoption of any reform effort. The purpose of the present study was to evaluate the factorial validity and reliability of a newly developed self-efficacy instrument, measuring Physical Education (PE) teachers' personal efficacy in teaching the six basic standards of the new national Greek PE curriculum (i.e., reform effort "New School- the school of the 21st century", 2011-2012 school year). The instrument was developed by a panel of experts experienced with self-efficacy measures. Following Bandura's guidelines (2006) a 22-item instrument was constructed, divided in six subscales (3-4 items each) corresponding to the six basic standards of the new curriculum. Participants were 149 in-service PE teachers (83 males, 66 females/ 74 primary, 75 secondary school) who responded voluntarily in anonymous questionnaires. Reliability of the scales was evaluated with Cronbach's alphas yielding satisfactory values for every subscale (>.74). To examine construct validity confirmatory factor analysis was conducted producing acceptable goodness-of-fit indices supporting the initial 22 item 6-factor correlated model (TLI= 0.912, CFI= 0.926, RMSEA= 0.86, χ^2 =406.6, *df* =194, χ^2/df=2.1). However, modification indices inspection indicated that the model fit could further improve. Thus, an alternative shortened 18-item model (3 items per factor) was tested yielding a significantly better model fit (TLI: 0.950, CFI: 0.960, RMSEA: 0.69, χ^2 =204.53, *df* =120, χ^2/df=1.70). Overall our analyses produced preliminary evidence of validity for this new instrument which may prove a useful tool to monitor physical educators' self-efficacy regarding the latest PE curriculum reform.

Introduction

Research in education has been consistently showed that teachers' self-efficacy beliefs are instrumental for their teaching behavior and students' achievement(Ashton & Webb, 1986; Tschannen-Moran, Woolfolk-Hoy, & Hoy, 1998). Teachers' self-efficacy is concerned