

1 **'The final, definitive version of this paper has been published in *European Physical***
2 ***Education Review*, Vol. 17 / Issue 2, 231-153, June, 2011 by SAGE Publications Ltd, All**
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5 *To cite this paper: Gorozidis, G., & Papaioannou, A. (2011). Teachers' self-efficacy,*
6 *achievement goals, attitudes and intentions to implement the new Greek physical education*
7 *curriculum. *European Physical Education Review*, 17(2), 231-253.*
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11 Teachers' self-efficacy, achievement goals, attitudes and intentions to implement the new
12 Greek Physical Education Curriculum

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20 *Running head: Teachers' self-efficacy, goals, intentions*
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2 **Teachers' self-efficacy, achievement goals, attitudes and intentions to implement the new**

3 **Greek physical education curriculum**

4

5 **Abstract**

6 The network of relations between Physical Education (PE) teachers' self-efficacy, goal
7 orientations, attitudes, intentions and behaviours concerning the implementation of a new PE
8 curriculum was examined. Participants were 290 Greek junior high school PE teachers. Two
9 years after the introduction of the new curriculum, participants responded to de-identified
10 questionnaires with acceptable psychometric properties. Mastery-oriented and high self-
11 efficacious teachers had positive attitudes towards the new curriculum, implemented the
12 biggest number of teaching plans and they intended to do the same in the future. Performance
13 approach goal orientation had low positive relationship with the implementation of teaching
14 plans and no relationship with intention to do the same in the future, while performance
15 avoidance goal was not related to any determinant of curriculum implementation and
16 intention. The effects of mastery goal orientation on intention and behaviour were mediated
17 by self-efficacy to achieve an educational aim which is an end in itself, that is, the promotion
18 of students' self-regulation in exercise settings. The effects of performance approach goal
19 orientation on behaviour were mediated by self-efficacy to achieve a curricular goal which is
20 a means to promote other educational aims, that is, the adoption of student-centred teaching
21 styles. Teaching experience was negatively related to implementation of the new curriculum
22 and with most of its determinants. Strategies aiming to strengthen teachers' self-efficacy,
23 mastery goals, attitudes and intentions to implement a new curriculum are suggested.

24

25 *Key words*

26 Innovation, teaching methods, self-regulation, teaching experience, resistance to change

1 In the last two decades there was a global tendency for educational reform in school
2 Physical Education (PE) (Hardman and Marshall, 2008). Similarly, PE in Greece at the
3 beginning of the school year 2006 was found to be in the centre of a top-down reform. After
4 16 years of no reform, renovation or change in the subject of PE, the Ministry of Education
5 introduced a new national curriculum in order to align with international trends (Hardman and
6 Marshall, 2000), and knowledge which was developed by a series of studies in Greek schools
7 revealing several maladaptive patterns. Specifically, from age 11 to 18 a continuous decline
8 of Greek students' motivation and perceptions of mastery-oriented climate in physical
9 education emerged (Digelidis and Papaioannou, 1999; Marsh et al., 2006; Papaioannou, 1997),
10 which is accompanied by a decrease of sport and exercise involvement in out-of-school
11 settings but an increase of health risks (e.g. Papaioannou et al., 2004).

12 Taking into consideration the training of current Greek PE teachers on sport-based
13 curricula, the Greek ministry launched a curriculum which is primarily sport-centred but
14 aimed to promote lifelong physical activity involvement (Corbin et al., 1987; Fox, 1992) and
15 holistic student development. Following successful interventions in Greek physical education,
16 the authors of the new curriculum introduced the following new elements: interdisciplinary
17 teaching (e.g. Cone et al., 1998; Milosis and Papaioannou, 2007), life skills (e.g. Goudas et
18 al., 2006), and teaching methods aiming at the promotion of students' responsibility (Hellison,
19 2003; Papaioannou and Milosis, 2009), autonomy and task-involvement (e.g. Christodoulidis
20 et al., 2001; Digelidis et al., 2003).

21 At the core of the new curriculum is the promotion of life long physical activity and
22 healthy lifestyle through self-regulation techniques and the development of life skills (Goudas
23 et al., 2006; Theodorakis et al., 2006). Teachers are encouraged to adopt a task-involving
24 climate facilitating students' self-determination in physical education (Digelidis et al., 2006;
25 Papaioannou et al., 2007; Papaioannou et al., 2008). New ways of teaching are proposed,
26 basically through the use of student-centred teaching styles (e.g. reciprocal style) (Mosston
27 and Ashworth, 2002), which are suggested to gradually replace most of the traditional teacher-

1 centred style (e.g. command style) which has been predominant in Greece. For the first time
2 in the modern history of Greek physical education, a sufficient number of recommended daily
3 teaching plans for the whole educational year were proposed in order to help PE teachers to
4 switch their practices and start using the proposed teaching methods.

5 It is well documented that teachers are the most important agents of an educational
6 reform effort (Hall and Hord, 2001). Moreover, teachers' beliefs and feelings about the new
7 curriculum are powerful indicators of their active participation in the implementation
8 procedure (Curtner-Smith, 1999; Fullan, 1991; McCaughtry et al., 2006; Rosenblatt, 2004;
9 Sparkes, 1991). Here we explain why it is important to understand the psychosocial
10 determinants of teachers' conscious decision to implement a new curriculum, and then we
11 present findings supporting a network consisted of different determinants, which are proposed
12 by three theories of motivation sharing an intentional perspective, namely Theory of Planned
13 Behaviour (TPB; Ajzen, 1991), social-cognitive theory and particularly Self-Efficacy (SET;
14 Bandura, 1977) and Achievement Goals Theory (AGT; Ames 1984; Elliot and Church, 1997;
15 Maehr and Nichols, 1980).

16 Curriculum reform in Physical Education

17 Reports in other countries reveal important reasons for PE curriculum reform.
18 According to Ward (1999) in the US, PE curricula for secondary education remained the same
19 for many years, PE in school was 'business as usual' and this resulted in PE time allocation
20 reduction, low status of PE teacher, and marginalization of PE in schools. This poor 'state and
21 status' of PE in schools have been acknowledged by European and World-wide surveys,
22 including Greece (Hardman, 2008; Hardman and Marshall, 2000; 2008) demonstrating that
23 PE is not considered to be a core subject matter (Hardman, 2008; Hardman and Marshall,
24 2000; Ward and Doutis, 1999).

25 Nevertheless, attempts to change curriculum in PE have been difficult to implement
26 and maintain (Curtner-Smith, 1999; Curtner-Smith et al., 1999; Rink and Stewart, 2003; Ward
27 et al., 1999). Several barriers and facilitators for successful implementation of reform efforts

1 have been revealed. Specifically, workplace conditions, poor resources (equipment, facilities),
2 teacher isolation and feelings of marginality, lack of collegiality and administrative support,
3 lack of knowledge, and difficult students, have been identified as hindrances for effective
4 implementation of new curricula (Castelli and Rink, 2003; Doutis and Ward, 1999; Stroot,
5 1994; Wirszyla, 2002). On the other hand, in line with Curtner-Smith's (1999) conclusions,
6 Rink and Stewart (2003) demonstrated how important it is to create a state policy and a shared
7 vision and to hold accountable every school, student and teacher in order to achieve change.
8 Most common facilitators for innovations' adoption are teachers' continuous professional
9 development, collaboration with colleagues, administrators, university faculty, teacher deep
10 knowledge of the program and principals' support (Castelli and Rink, 2003; Curtner-Smith,
11 1999; Ward et al., 1999; Wirszyla, 2002; Wright et al., 2006).

12 Top-down reform efforts have been criticized as ineffective (Darling-Hammond, 1990;
13 Locke, 1992). Past studies showed that the introduction of National Curriculum for PE
14 (NCPE) in England and Wales did not result in alteration of PE teachers' philosophies, while
15 it had small or no effect on their teaching practices (Curtner-Smith, 1999; Curtner-Smith et
16 al., 1999; Green, 1998). Wright et al. (2006) suggested that innovative curriculum
17 implementation seems to be problematic, especially when it is mandated from the state as a
18 directed contact change (i.e. when outsiders present new practices to fulfil goals that they
19 value). However, this kind of reform is maybe the most appropriate to initiate a wide range
20 reform, and Fullan (1991) suggested that in order to initiate reform in education, sometimes,
21 external pressure (i.e. from policy makers, parents, legislators) is necessary.

22 Continuous professional development is the means to implement reform efforts
23 ([Fullan, 1991](#)) leading to a substantive and prolonged change (Rink and Mitchell, 2003; Ward,
24 1999). In many cases the usual in-service training and continuing professional development
25 provided for PE teachers seem inadequate and limited (Hardman, 2008; Hardman and
26 Marshall, 2008; Rink and Williams, 2003; Ward and Doutis, 1999). Ward's and Doutis's
27 (1999) description of the traditional 'one-shot design' for teachers' in-service training, well-

1 define the way policy makers selected to inform and to educate Greek PE teachers for the new
2 national curriculum. However, even when appropriate in-service training programs were
3 offered, Faucette (1987) found that, not all of the teachers who attended the same program
4 became users of the new curriculum. Taking into consideration these findings and the fact that
5 there is no effective accountability system for teachers in Greece, one can assume that an
6 essential factor for the adoption of the new curriculum is the cognitive and psychological
7 functioning of each teacher.

8 Indeed, PE teachers' positive attitudes and willingness to try new things and make
9 successful change facilitates the implementation of the new curriculum (Cothran, 2001;
10 Fraser-Tomas and Beaudoin, 2002). Additionally, Rink and Stewart (2003) reported that,
11 teachers who perceived themselves good in their job welcomed the change and Doutsis and
12 Ward (1999) found that teachers who perceived reform as 'partially imposed and partially
13 needed' (i.e. not totally dictated, feeling a degree of freedom concerning their curriculum),
14 embraced it. Moreover, [Faucette \(1987\)](#) identified three types of teachers regarding their view
15 of a new curriculum: resisters, conceptualizers and actualizers. Only actualizers who initially
16 agreed with the innovation, succeeded in increasing their confidence and fully implemented
17 the new curriculum. They felt that the support they received from their principals enhanced
18 their sense of self-efficacy. Conceptualizers, although they were positively disposed to the
19 innovation felt insecure and incompetent, while resisters felt negatively about the new
20 curriculum and reported feelings of discomfort and insecurity with their abilities to be
21 effective. Both conceptualizers and resisters became nonusers and failed to implement the
22 proposed changes.

23 In all aforementioned studies the research methodology has been qualitative and the
24 sample sizes were very small, which limits the generalization of results. Although there is a
25 number of studies adopting a quantitative research methodology to examine PE teachers'
26 cognitions and behaviours during educational reform (e.g. [Martin et al., 2008; 2009](#)) it is
27 important to extend this line of research across countries where curriculum changes are

1 introduced. Summarizing results from different countries will broaden our understanding
2 about the psychosocial determinants of teachers' motivation to implement a new curriculum
3 and, consequently, how to intervene on these determinants and help teachers become
4 actualizers ([Faucette, 1987](#)) when a new curriculum is introduced.

5 The necessity to understand what determines teachers' decision to implement a new
6 curriculum led us towards social-cognitive theories sharing an intentional perspective. Each of
7 these are described below followed by specific hypotheses linking their essential components
8 that might help us understand what determines teachers' conscious decisions regarding
9 curriculum implementation.

10 Theory of Planned Behaviour (TPB)

11 According to Ajzen (1991) intention is considered to be the activator of behaviour.
12 Knowing the intention of a person, his behaviour can be accurately predicted. Intentions are
13 determined by individuals' beliefs and their formation is dependent on individuals' attitudes
14 toward the behaviour, perceived behavioural control (facilitators and impediments of the
15 behaviour) and subjective norm (perceived social influences) ([Ajzen, 1991](#)). Sheppard,
16 Hartwick, and Warshaw (1988) in their meta-analysis of 87 studies in various contexts, found
17 that intention is highly related to behaviour, while the relation of intention with attitudes and
18 subjective norm is even more powerful. These findings were replicated in the physical activity
19 domain of Greece (Theodorakis, 1992; 1994; Theodorakis et al., 1993). These studies also
20 revealed that past behaviour contributes significantly in the prediction of future behaviour.
21 Indeed, Ouellette and Wood (1998) in their meta-analytic synthesis of existing research and in
22 their own study demonstrated that frequency of past behavior directly predicts intentions, and
23 past behavior directly contributes to future behavior.

24 More recently it has been also revealed that teachers' attitudes and perceived
25 behavioural control were predictors of their intentions in physical education classes, and that
26 PE teachers' attitudes and intentions predicted significantly their actual behaviour (Martin et
27 al., 2001; Martin and Kulina, 2004; 2005; Stewart-Stanec, 2009). Taking into consideration

1 that hypotheses based on TPB are valid in Greece, it was expected that attitudes would be
2 strong determinants of intentions to implement a new curriculum, and that teachers' attitudes,
3 intentions and past behaviours would be positively related.

4 Self-Efficacy

5 Self-efficacy beliefs are peoples' judgments of their capability to undertake and
6 execute successfully a specific task in a specific context ([Bandura, 1977; 1997](#)). Through the
7 formation of human behavior self-efficacy has a great impact on peoples' motivation and
8 personal accomplishments. Highly efficacious teachers tend to be more organized, try to find
9 better ways of teaching, they are willing to experiment and to use new instructional material,
10 innovative methods and are more enthusiastic about teaching ([Allinder, 1994](#)), while teachers'
11 efficacy relates to positive attitudes and acceptance of new teaching styles (Ghaith and Yaghi,
12 1997; Guskey, 1988). Reviewing 88 studies in education, [Ross \(1994\)](#) summarized that
13 teachers' efficacy is associated with the use of challenging and more difficult teaching
14 techniques, higher implementation of new innovative programs, better classroom
15 management, the use of more humanistic approaches to control class and the promotion of
16 students' autonomy, cognitive and affective development, and the increase of students'
17 motivation. [Evers et al. \(2002\)](#) also reported that highly efficacious teachers tend to be more
18 prepared to experiment and to implement educational innovations.

19 Few studies examined PE teachers' self-efficacy. [Martin et al. \(2001\)](#) found that PE
20 teachers with stronger sense of efficacy to teach physically active classes had stronger
21 intentions to promote vigorous physical activity in comparison to low efficacious teachers. PE
22 teachers with positive beliefs about the importance of program goals and high self-efficacy
23 were the most likely to implement their program ([Martin and Kulinna 2004](#)). In a study with
24 160 Greek PE teachers, [Stephanou and Tsapakidou \(2008\)](#) found that highly efficacious
25 teachers expressed more positive opinions for student-centred teaching styles and they
26 reported more frequent adoption of these styles than teachers with low self-efficacy.

1 acknowledged (Papaioannou, 2006; Papaioannou et al., 2007). Therefore, the present study
2 examined the four aforementioned goals that may influence PE teachers' behaviour in their
3 work.

4 The benefits of mastery goals in employees' performance, motivation, and working
5 quality have been acknowledged (e.g. Moss and Ritossa, 2007; Sujan et al., 1994; Vandewalle
6 et al., 2001). In a recent study in Greece, Papaioannou and Christodoulidis (2007) found that
7 job satisfaction was positively related to teachers' mastery goals but it was not related to
8 performance approach goals and performance avoidance goals. Christodoulidis (2004) also
9 concluded that high mastery-oriented teachers had greater intrinsic motivation and higher self-
10 efficacy in their work. These results are rather consistent with recent findings in other
11 countries revealing positive motivational outcomes when teachers adopt mastery goals,
12 negative outcomes when they adopt performance avoidance goals and mixed findings when
13 teachers adopt performance approach goals (Butler, 2007; [Butler and Shibaz, 2008](#); Retelsdorf
14 et al., 2010). Based on this literature it was expected that mastery goal adoption would be a
15 determinant of PE teachers' self-efficacy and intention to implement the new curriculum.

16 Teaching experience and the implementation of a new curriculum

17 Another scope of this study was to find whether teaching experience affects PE
18 teachers' cognitions and behaviours concerning the implementation of the new curriculum.
19 Although experience in a workplace is generally considered to be a great advantage for most
20 professionals, there are studies suggesting that when it comes to innovation and specifically to
21 new teaching practices experience can be an obstacle rather than a facilitator. Curtner-Smith
22 (1999) reported that experienced teachers are more resistant to change and less experienced
23 teachers are more likely to implement new innovative programs. Ghaith and Yaghi (1997)
24 indicated that experience was negatively correlated with teachers' attitudes toward
25 implementing new instructional practices. Ma et al. (2009) found that positive attitudes
26 towards curriculum reform and behavioral intentions decline with teaching experience.
27 Moreover, in a multi-national study about school reform Rosenblatt (2004) noticed that less

1 senior at work teachers were more open to change their teaching ways and methods and to
2 exercise various skills in order to align with the transformation of school work. There are also
3 findings implying that years in education is negatively related to self-efficacy (Guskey and
4 Passero, 1993) and teachers' mastery orientation (Retelsdorf et al., 2010). Although this
5 literature does not provide evidence supporting a causal explanation, these findings suggest
6 that years in education might correspond negatively to teachers' self-efficacy and intentions to
7 implement the new curriculum.

8 Purposes

9 The main scope of this study was the investigation of the network of relations amongst
10 PE teachers' self-efficacy, goal orientations, attitudes, intentions and past behaviours
11 concerning the implementation of the new curriculum. The study focused on the determinants
12 of teachers' intention to implement the new curriculum in the next year but also on the
13 determinants of teachers' implementation of the curriculum last year because past behaviour
14 is a strong predictor of future behaviours ([Ouellette and Wood, 1998](#)). Based on social-
15 cognitive theory ([Bandura, 1997](#)) it was expected that self-efficacy would be a mediator
16 between dispositions such as goal orientations and situation-specific constructs such as
17 intentions and behaviours. Self-efficacy was examined with respect to three curricular goals:
18 (1) promotion of students' self-regulation in exercise settings, and (2) implementation of
19 teaching plans and (3) implementation of student-centred teaching methods. While the first as
20 an educational aim is an end in itself, the other two curricular goals should be considered as a
21 means to achieve other educational aims. Taking into consideration that mastery oriented
22 individuals pursue goals that are an end in itself ([Nicholls, 1989](#)), it was expected that the
23 effects of mastery goal orientation on curriculum implementation and intentions would be
24 mediated by self-efficacy to promote students' self-regulation in exercise. On the other hand,
25 taking into consideration that performance approach oriented individuals pursue goals that are
26 means to another end (e.g., exhibit that they implement the new daily plans), it was expected
27 that any effects of performance approach goal orientation on curriculum implementation

1 would be mediated by self-efficacy to implement student-centred methods and the new daily
2 plans. If the expected network of relationships is correct, educational policies and in-service
3 training should target these variables to facilitate educational reform in physical education.

4 Method

5 *Participants and Procedure*

7 Four hundred and thirty PE teachers who work in Junior High Schools located all over
8 Greece were randomly selected from the official catalogues of secondary public education,
9 representing 15.3% of all Greek PE teachers in Junior High Schools¹. We particularly
10 focused on Junior High School teachers because the age of their students (12-15) is the
11 starting point of significant decreases in all motivational indices in physical education and
12 sport settings (Digelidis and Papaioannou, 1999; Marsh et al., 2006; [Papaioannou, 1997](#)).
13 Thus, the implementation of the new curriculum is particularly important for junior high
14 school students (e.g. [Digelidis et al., 2003](#)). After teachers' agreement to participate in the
15 study² and during the 1st trimester of academic year 2008/2009, the third academic year after
16 the introduction of the new PE curriculum in junior high school, these teachers received the
17 de-identified questionnaires that are described below. Participants were informed that the
18 findings would be used exclusively for scientific purposes. A total of 303 teachers completed
19 the questionnaires and posted them back without mentioning their name in the envelope
20 (response rate 70%). We excluded 13 questionnaires which were not completed properly (e.g.
21 more than 20% of missing values).

22 The final sample comprised 290 in-service Greek PE teachers, 179 males (62%) and
23 110 females (38%), while 1 did not indicate gender. From them, 95.2% (n=276) held
24 permanent position in education, while 3.4% (n=10) held temporary position (4 did not
25 respond; 1.4%). All of them were working in public schools (1st, 2nd, 3rd grades of junior high
26 school), in 11 out of the 13 regions of Greece (including the metropolitan areas of Athens and
27 Thessaloniki). Years of teaching experience ranged from 1 to 33, M = 12.6, SD = 8.3.

28 *Measures*

1 After a brief demographic scale the following questionnaires were used.

2 *Theory of Planned Behaviour Measures*. According to Ajzens' (2002) guidelines, 3
3 scales were constructed in order to assess attitudes, intentions and past behaviours of PE
4 teachers concerning the implementation of the new curriculum. In order to shorten the size of
5 the questionnaire, we did not assess perceived behavioural control because it is a very similar
6 construct to self-efficacy ([Ajzen, 1991](#)) as well as subjective norm which is generally
7 regarded as a worse predictor than attitudes and intentions (e.g. [Theodorakis, 1994](#)).

8 The *attitudes* scale included 4 items assessing PE teachers' attitudes toward the
9 implementation of the new curriculum. Under the general stem 'teaching at least 50% of the
10 proposed teaching plans of the new curriculum during the next season is ...', participants
11 responded in a 7-point semantic differential scale with 4 opposite pairs of adjectives (e.g.
12 *good/bad, useful/useless, important/unimportant, pleasant/unpleasant*). In this study the alpha
13 reliability was .93.

14 Two items assessing PE teachers' *intentions* to implement the new curriculum were
15 used: 'During the next season I plan to teach at least 50% of the proposed teaching plans of
16 the new curriculum...' (*likely/unlikely*) and 'During the next season I am determined to teach
17 at least 50% of the proposed teaching plans of the new curriculum...' (*yes/no*). Participants
18 responded in 7-point semantic differential scales. The alpha reliability for this scale was also
19 .93.

20 The *past behaviours* scale consisted of 3 items. Teachers were asked 'During the past
21 academic year how many teaching plans of the proposing ones did you teach in every class...':
22 'in general?', 'so that in every class, at least 70-80% of the tasks come from the plans of the
23 new curriculum?', 'so that in every class, at least 50-70% of the tasks come from the plans of
24 the new curriculum?'. Taking into consideration that each academic year contains about 60
25 sessions/classes of physical education, for every item teachers indicated their preference in a
26 13-point scale ranging from 0 to 60 (e.g. 0, 1-5...36-40...56-60). The alpha reliability score
27 produced by the present scale was .98.

1 *Self-efficacy Theory Measures*. Based on Bandura's theory (1997) and his guidelines
2 for the construction of self-efficacy scales ([Bandura, 2006](#)), we developed 3 measures
3 capturing self-efficacy in (1) teaching lesson plans, (2) teaching styles, and (3) promoting
4 students' exercise self-regulation. Responses to the items of all three Self-efficacy Theory
5 measures were given on 11-point scales ranging from 0% (*not confident at all*) to 100%
6 (*absolutely confident*). Similar scales for American PE teachers have produced reliable and
7 valid scores (Martin and Kulinna, 2004, 2005; [Martin et al., 2001](#)).

8 The *Self-Efficacy in Teaching Plans* scale consists of 3 items that were developed to
9 assess PE teachers' self-efficacy beliefs that they can implement the proposed daily teaching
10 plans. Following the stem 'From the total number of the new curriculum's daily teaching
11 plans, how confident are you that you can implement in your school...' participants indicated
12 their responses to 4 items indicating different percentages of daily teaching plans (100%, or
13 75%, or 50% of the total number of proposed daily teaching plans). Scale alpha reliability was
14 .91.

15 The *self-efficacy in teaching styles* scale consists of two subscales, the first capturing
16 Self-Efficacy in Student-Centred Teaching Styles and the second measuring Self-Efficacy in
17 Teacher-Centred Teaching Styles³. Although Mosston and Ashworth (2002) categorized
18 teaching styles of the *spectrum* in two clusters reproductive-productive, we used the
19 categorization suggested by Byra (2006) teacher-student centred which was in agreement with
20 the present theoretical conceptualization and exploratory factor analysis results. Following the
21 stem 'In your school how confident you are that you can teach effectively using the next
22 teaching styles...' teachers responded to 11-point scales for each of the following 6 styles:
23 command, practice, reciprocal, self-check, inclusion, and learner-initiated. To make sure that
24 all readers would recognize all teaching styles, a brief explanation of each style was provided.
25 Principal components factor analysis of teachers' responses to this scale revealed two factors.
26 The first was named 'Self-efficacy in student-centred teaching styles' with eigenvalue of 2.85,
27 explaining 47.6% of the total variance. It included the items 'reciprocal, self-check, inclusion

1 and learner-initiated'. All loadings were higher than .69 and alpha reliability was at .82. The
2 second factor was named 'Self-efficacy in teacher-centred teaching styles' with eigenvalue of
3 1.18, explaining 19.6% of the total variance. This factor was consisted of only 2 items,
4 command and practice style, with loadings higher than .71. However, the alpha reliability for
5 the 2-item scale was not satisfactory, at .52. These teaching styles were hardly innovative for
6 Greek PE curriculum and, therefore, due to low alpha reliability score this factor was
7 excluded from further analyses.

8 The *Self- efficacy in promoting Students' Exercise Self-Regulation* consists of 4 items
9 following the stem 'In your school, how confident are you that you can help all your students
10 to...': 'set goals for regular exercise outside school and accomplish them?', 'find ways to
11 exercise outside school, even those who have difficulty to do so?', 'exercise outside school
12 more than today?' and, 'monitor themselves how much they exercise so as to set goals for
13 more exercise?'. Cronbach's alpha for this scale was .91.

14 *Achievement Goal Theory measure.* PE teachers' achievement goal orientations were
15 assessed using the Teachers' Achievement Goals in Work Questionnaire (TAGWQ)
16 (Christodoulidis, 2004; Papaioannou, and Christodoulidis, 2007). The opening stem of this
17 measure was 'In my work place...', the scale consisted of 16 items corresponding to 4 factors:
18 'mastery goals' (four items; e.g. 'My goal is to continuously develop my abilities as a
19 teacher'), 'performance approach goals' (four items; e.g. 'I am absolutely satisfied when it
20 looks that I am better teacher than others'), 'performance avoidance goals' (four items; e.g. 'I
21 want to avoid teaching tasks in which I may look incapable') and 'social approval goals' (four
22 items; e.g. 'It's important to me to teach a good lesson so that my students love me'). For each
23 item responses were indicated on 5-point Likert type scales ranging from 1 (*strongly disagree*)
24 to 5 (*strongly agree*). Internal reliabilities were satisfactory with alphas equal to .71, .87, .83
25 and .84, for mastery, performance approach, performance avoidance and social approval
26 goals, respectively.

27 *Pilot Study*

1 Prior to the contact of the main study with the 430 teachers, the present scales had
2 been tested in a pilot study involving 138 Greek PE teachers (86 males, 52 females). The
3 achievement goals questionnaire was not used in the pilot study because it is a valid and
4 reliable instrument in the Greek context ([Papaioannou and Christodoulidis, 2007](#)). Construct
5 validity and internal consistency of the measures were tested via exploratory factor analyses
6 and alpha reliability tests respectively. Results from factor analyses and scale correlations
7 were in line with expectations and similar to those of the main study that are described below.
8 For reasons of parsimony only Cronbach's alphas are reported here, while the factor analytic
9 and scale correlation results are available from the authors upon request. Alphas were .93 for
10 Self-Efficacy in Teaching Plans, .89 for Self-Efficacy in Student-Centred Teaching Styles, .93
11 for Self- efficacy in promoting Students' Exercise Self-Regulation, .97 for past behaviours,
12 .87 for attitudes, and .84 for intentions.

13 *Statistical Analyses in Main Study*

14 Confirmatory factor analysis was performed to assess the factorial validity of the present
15 measures. Convergent and divergent validity was investigated via factor correlations
16 investigating the hypothesized network of relationships between constructs. A rigorous
17 construct validation approach was employed with a single Confirmatory Factory Analysis
18 (CFA) whereby we tested concurrently the whole bunch of instruments using maximum
19 likelihood estimation (e.g. Marsh et al., 2006). When multidimensional measures are used,
20 such as the Achievement Goal Theory and Theory of Planned Behaviour scales, this analysis
21 allows one to investigate simultaneously both the between and the within-measures
22 independence of constructs. A description of the conduct of CFA and evaluation of goodness
23 of fit is beyond the scope of the present study and is available elsewhere (e.g. Joreskog and
24 Sorbom, 1993; Marsh et al., 1996). In evaluating goodness of fit we emphasized the Tucker-
25 Lewis index (TLI) and the Comparative Fit Index index (CFI), but also the Root Mean Square
26 Error of Approximation (RMSEA), the χ^2 test statistic, and an evaluation of parameter
27 estimates. The TLI and CFI vary from 0 to 1, with values greater than .90 and .95 reflecting

1 acceptable and excellent fit to the data respectively. For RMSEAs, values of less than .05 and
2 .08 are taken to reflect a close fit and a reasonable fit, respectively (see Joreskog and Sorbom,
3 1993; Marsh et al., 1996).

4 Scale reliabilities and scale scores were computed for each factor. Next, two structural
5 equation models were constructed. With the first model we investigated the effects of goal
6 orientations and self-efficacy latent variables on curriculum implementation in the previous
7 academic year. With the second model we examined the effects of goal orientations, self-
8 efficacy and attitudes on intention to implement the new curriculum in the next academic
9 year. Performance avoidance goal was not included in these models because it was unrelated
10 to both behaviour and intention (Table 1). For both models, dispositions (i.e. goal
11 orientations) were considered exogenous variables while variables which mainly depict
12 response to situational demands (self-efficacy, attitudes, intentions) were considered
13 endogenous. All models were constructed using AMOS 5 software.

14 Results

15 *Construct validation: Confirmatory factor analysis.*

16 We evaluated the factor structure of the 10 factors which are shown in Figure 1. The
17 fit of the overall model was good, (TLI = .931, CFI = .943, RMSEA = .050, $\chi^2 = 964$, $df =$
18 549 , $\chi^2/df = 1.76$). Taking into consideration the complexity of the model, these findings
19 support the factorial validity of the present measures.

PLEASE INSERT FIGURE 1 ABOUT HERE

20 Factor correlation results are described below. Impressively, all findings were in line
21 with theoretical assumptions, providing strong evidence of convergent and divergent validity
22 for the instruments of this study. A detailed description of these relationships follows below.

23 *Relationships of past behaviour with other factors.* In line with Theory of Planned
24 Behaviour, implementation of the curriculum in the previous year was most strongly related to
25 intention ($r = .57$, $p < .001$) (Table 1). As it was expected, implementation of the curriculum
26 had positive relationship with attitudes and self-efficacy ($r = .35$, and $r > .30$ respectively, p

1 <.001), with mastery ($r = .21, p <.01$), performance approach ($r = .17, p <.01$) and social
2 approval goals ($r = .20, p <.01$), no relationship with performance avoidance and negative
3 relationship to teaching experience ($r = -.14, p <.05$).

4 *Relationships among Theory of Planned Behaviour and Self-efficacy Theory factors.*

5 In line with social cognitive theory (Bandura, 1997), relationships among Theory of Planned
6 Behaviour factors and among Self-efficacy Theory factors were positive and meaningful ($r >$
7 $.35, p <.001$). Furthermore, all Theory of Planned Behaviour factors were positively
8 associated with all Self-efficacy Theory factors ($r > .26, p <.001$) except of self-efficacy in
9 teaching plans-attitudes ($r = .16, p <.05$).

10 *Relationships among Theory of Planned Behaviour and Achievement Goal Theory*

11 *factors.* Correlations among Achievement Goal Theory factors (Table 1) were in line with
12 past findings (e.g. [Papaioannou and Christodoulidis, 2007](#)). Specifically, mastery goal was
13 positively related to performance approach ($r = .19, p <.05$) and social approval goals ($r = .54,$
14 $p <.001$). The two performance goals were positively connected between each other ($r = .39, p$
15 $<.001$). Mastery goal was not related to performance avoidance goal. Finally, social approval
16 goal was positively related to performance approach ($r = .45, p <.001$) and avoidance goals (r
17 $= .25, p <.001$).

18 Intentions were positively associated with mastery ($r = .25, p <.01$) and social
19 approval goals ($r = .26, p <.001$), while attitudes were only related to social approval goal ($r =$
20 $.20, p <.01$).

21 *Relationships among Achievement Goal Theory and Self-efficacy Theory factors.*

22 Mastery goal corresponded positively to self-efficacy in promoting students' exercise self-
23 regulation ($r = .26, p <.01$). Performance approach goal was positively related to self-efficacy
24 in student-centred teaching styles ($r = .18, p <.01$) and self-efficacy in promoting students'
25 exercise self-regulation ($r = .14, p <.05$). Performance avoidance and social approval goals
26 were unrelated to Self-efficacy Theory factors (Table 1).

27 *Relationship of Teaching Experience with other variables*

1 Pearson product moment correlations between years in education and all scale scores
2 (Table 1) revealed that teaching experience was negatively related to all Theory of Planned
3 Behaviour ($r < -.14, p < .05$) and Self-efficacy Theory ($r < -.17, p < .01$) variables. Moreover,
4 years in education were negatively associated with mastery goal ($r = -.13, p < .01$).

5 *Descriptive statistics*

6 Means and standard deviations for each scale are shown in Table 1. On average
7 teachers suggested that they implemented about 45% of the daily lesson plans. About 10% of
8 the teachers suggested that they implemented more than 75% of the daily plans while another
9 10% of the teachers reported that they did not implement even a single daily plan.

10 Although teachers' attitudes and intentions seem relatively positive, only 13.9% of the
11 teachers were absolutely definite that the new curriculum is something important, good,
12 pleasant and useful, while only 22.6% stated that they will definitely implement the new
13 curriculum in the next year (i.e. scale scores = 7). Teachers' self-efficacy to implement the
14 new curriculum emerged relatively high but again only 8.3% of them were absolutely
15 confident (i.e. scale scores = 10-11). In comparison, teachers' self-efficacy to employ student-
16 centred methods or to promote students' self regulation in physical activity was lower; for
17 example, less than 2% of the teachers were absolutely confident that they can use all student-
18 centred methods and they can promote students' self-regulation (i.e. scale scores = 10-11).
19 Indeed, significant differences emerged when self-efficacy in teaching daily lesson plans was
20 contrasted with (a) self-efficacy in using student-centred methods ($F(1, 252) = 160.8, p < .001$,
21 *partial* $\eta^2 = .39$), and (b) with self-efficacy in promoting students' self-regulation ($F(1, 253) =$
22 $41.13, p < .001, \textit{partial} \eta^2 = .14$).

PLEASE INSERT TABLE 1 ABOUT HERE

24 *Path Analysis: Determinants of past behaviour and intentions*

25 *Implementation of the new curriculum in the last academic year.* In the initial model
26 three goal orientations latent variables were constructed from the respective observed

1 variables. These three exogenous variables were assumed to be correlated. Endogenous
2 variables were the three self-efficacy latent variables and the latent variable implementation of
3 the daily plans in the last academic year. Initially, all exogenous variables were assumed to
4 affect all endogenous variables. Moreover, it was assumed that self-efficacy in student-centred
5 teaching styles and self-efficacy in promoting students' exercise self-regulation would have
6 direct effects on implementation of the daily teaching plans, but also indirect effects through
7 self-efficacy in teaching daily lesson plans. It was evident from the beginning that all paths
8 that were started from social approval goal were not significant, hence this latent variable was
9 excluded from further analyses. In a reformulation of the initial model all paths with
10 regression coefficients close to zero were excluded and the model was improved by retaining
11 only paths with statistically significant coefficients ($p < .05$).

12 The final model is shown in Figure 2. The goodness-of-fit indices for this model were
13 good (TLI = .964, CFI = .971, RMSEA = .055, $\chi^2 = 325$, $df = 202$, $\chi^2/df = 1.61$). According to
14 this model, self-efficacy in teaching daily lesson plans and self-efficacy in promoting
15 students' exercise self-regulation had direct effects on curriculum implementation in the last
16 academic year. The effects of self-efficacy in the use of student-centred teaching styles on
17 curriculum implementation were indirect through the two aforementioned self-efficacy
18 variables. The effects of performance approach goals were mediated by self-efficacy in the
19 use of student-centred styles, while the effects of mastery goals were mediated by self-
20 efficacy in promoting students' exercise self-regulation.

PLEASE INSERT FIGURE 2 ABOUT HERE

21 In total, 17% of the total variance of implementation of the proposed daily teaching
22 plans was explained by the sum of these exogenous and endogenous variables. The remaining
23 unexplained variance implies that other variables such as those suggested by TPB should be
24 taken into account. Indeed, the findings in Table 1 imply that if we had included intention in
25 the present model, the total variance of curriculum implementation would have been
26 substantially higher. We did not include intention because it would be logically inconsistent to

1 use intention for future actions as a predictor of past behaviour. On the other hand, it seems
2 important to investigate the determinants of intention.

3 *Intention to implement the new curriculum in the next academic year.* In line with the
4 previous model the three goal orientations latent variables were exogenous variables while
5 endogenous were the three self-efficacy latent variables, the attitudes latent variable and the
6 intention latent variable (Figure 3). In the initial model, all exogenous variables had effects
7 on all endogenous variables. Moreover, it was assumed that self-efficacy in student-centred
8 teaching styles and self-efficacy in promoting students' exercise self-regulation would have
9 direct effects on intention, but also indirect effects through attitudes and self-efficacy in
10 teaching the proposed daily lesson plans. In a reformulation of the initial model (1) the
11 performance approach goal was removed because all paths that were started from this latent
12 variable were not significant, (2) all paths with regression coefficients close to zero were
13 excluded and (3) only paths with statistically significant coefficients were retained ($p < .05$).

14 The goodness-of-fit indices for the final model were good (TLI = .934, CFI = .946,
15 RMSEA = .055, $\chi^2 = 513$, $df = 267$, $\chi^2/df = 1.92$). Performance approach goal was not
16 included because it was not related to intention. In line with TPB, attitude was placed as the
17 most proximal variable to intention. Indeed, as is shown in Figure 3, attitude and self-efficacy
18 in teaching daily teaching plans had direct effects on intention to implement the new
19 curriculum in the following year. As was expected, the effects of goal orientations on
20 intention were indirect. The effects of social approval goal were mediated by attitude while
21 the effects of mastery goal were mediated by self-efficacy in promoting students' self-
22 regulation in exercise settings. The effects of self-efficacy in student-centred styles on
23 intention were indirect through attitudes and self-efficacy in teaching the new daily teaching
24 plans. The effects of self-efficacy in promoting students' exercise self-regulation were
25 mediated by self-efficacy in the use of student-centred styles. In sum, 60% of the variance of
26 intention was explained by the variables shown in Figure 3, but a large proportion of this
27 variance was explained just by attitudes.

PLEASE INSERT FIGURE 3 ABOUT HERE

Discussion

Introducing a new curriculum at a national level is a challenging task. Extensive in-service teacher retraining is needed to make sure that teachers will implement effectively the new curriculum ([Rink and Williams, 2003](#); [Ward, 1999](#)). Curriculum change in Greece was a top-down reform which was evidence based but also disconnected from teachers' continuing professional development. Hence, the present findings suggesting that this reform was not embraced by many Greek PE teachers are hardly surprising. Teachers' responses suggest that two years after the introduction of the new curriculum, less than 50% of the proposed tasks were taught, while a significant number of teachers did not bother at all about its implementation.

Furthermore, many teachers who reported that they taught some of the proposed daily plans probably did not adopt the proposed teaching methods aiming to affect students' self-determination, task-involvement and self-regulation. Indeed, teachers' scores on self-efficacy to implement the daily lesson plans were much higher than their self-efficacy to promote students' self-regulation through student-centred styles. This finding implies that many teachers believe that it is enough to implement some of the proposed teaching tasks using their familiar teacher-centred styles. According to Ward et al. (1999) a necessary requirement for curriculum reform is the deep knowledge of the curriculum, but it seems that teachers often do not have this kind of knowledge. In-service training programs should convey persuasive information about the importance of replacing the old teaching methods with new, in order to strengthen teachers' attitudes and intentions to implement a new curriculum. This study revealed that in-service training programs should primarily target PE teachers' intention, attitudes, self-efficacy and mastery goal orientation in order to make sure that teachers will eventually implement a new curriculum.

Our finding that mastery-oriented teachers were more likely to implement the current reform fits well with reports that seeking for help and collaboration by teachers during change

1 is a very important facilitator ([Cothran, 2001](#); Doutis and Ward 1999). As Butler (2007)
2 revealed, mastery oriented teachers are more inclined to seek for help in order to become
3 more knowledgeable and improve their teaching. A strong mastery orientation directs
4 teachers towards improvement of their teaching competences and collaboration with their
5 peers in order to apply effectively new innovative curricula. Importantly, a strong mastery
6 goal cultivates positive expectations for success by enhancing teachers' self-efficacy to apply
7 effectively the new curriculum and the proposed student-centred teaching methods. In turn,
8 high self-efficacy strengthens teachers' intentions to apply the new curriculum and the
9 innovative teaching methods. Thus, in line with Rink's and Stewart's (2003) finding that
10 teachers who thought they were doing a good job welcomed the opportunity to exhibit the
11 results of their teaching, the present results imply that teachers with high self-efficacy were
12 more likely to implement change.

13 Importantly, the implementation of student-centred teaching styles and the new daily
14 plans is not necessarily a fully self-determined decision for all teachers. Some teachers might
15 adopt these behaviours in order to exhibit that they comply with the requirements. In other
16 words the adoption of student-centred teaching styles and the implementation of daily plans is
17 a means to achieve the aims of the curriculum such as the promotion of students' self-
18 regulation in physical activity settings. That is why self-efficacy in student-centred teaching
19 styles was mediator of performance approach goal orientation and implementation of the new
20 curriculum in the previous year, and why attitudes were mediator of social approval goal
21 orientation and intention toward implementation.

22 On the other hand, the promotion of students' exercise self-regulation is not an easily
23 observable outcome by others. Even though it is a substantial goal of teaching and central aim
24 of the new curriculum, the achievement of this goal is an end in itself in the teaching process.
25 In line with Nicholls' theory (1989) teachers' mastery goal orientation was a positive
26 antecedent of their self-efficacy to promote students' exercise self-regulation and the latter
27 self-perception had an impact on curriculum implementation and intention to implement the

1 new curriculum in the future. Hence, the approach of mastery-oriented teachers perhaps is
2 more likely to achieve the aims of education than the approach of performance oriented
3 teachers who seem prone to exhibit that they implement the new curriculum, without
4 necessarily pursuing the actual aims of education.

5 Teacher continuous professional development should provide sufficient mastery
6 experiences, vicarious experiences (i.e. learning through modeling-observation) and a positive
7 emotional state, which are the most important sources for teachers' self-efficacy (Bandura,
8 1977; [Tschannen-Moran and Woolfolk Hoy, 2001](#)). Mastery experiences and emotional state
9 should be pertinent to the innovative elements of the curriculum, such as the student-centred
10 styles and the self-regulation techniques which were the focus of this study. Ward et al.,
11 (1999) felicitously suggested that, teachers need to revisit their pedagogy and to discover
12 alternatives teaching strategies in order to implement change. As it emerged here, by
13 increasing teachers' self-efficacy on the implementation of the innovative elements of the
14 curriculum there will be both a direct effect on teachers' intentions and behaviours and an
15 indirect effect through their positive effect on attitudes and self-efficacy to implement the new
16 curriculum as a whole.

17 Policy makers should also directly target teachers' intention to implement the new
18 curriculum. One possibility is the adoption of goal setting programs specifying measurable
19 goals regarding the implementation of new elements of the curriculum. These programs
20 should be accompanied by procedures providing immediate, clear and unambiguous feedback.
21 Teachers can receive this type of feedback through effective self-monitoring and self-
22 assessment systems. As Castelli and Rink (2003) demonstrated, teacher training accompanied
23 by administrative support and an accountability system were important in the successful
24 implementation of curriculum change. The implementation of personal goal setting programs
25 accompanied by self-monitoring is expected to create a mastery climate with positive effects
26 on teachers' mastery goal orientation.

1 The organizational culture of schools is important for an effective implementation of a
2 new curriculum. A school climate emphasizing teachers' task-involvement, personal
3 improvement and effort might have positive effects on teachers' mastery and social approval
4 goals which are determinants of self-efficacy beliefs and positive attitudes towards the
5 implementation of a new curriculum respectively. According to Doutsis and Ward (1999),
6 when political and economic environment of the school (e.g. resources, national requirements
7 and community demands for PE) supports reform, educational change is possible and
8 innovative projects can be successful. Taking into consideration findings suggesting that the
9 effects of individuals' goals should be examined in conjunction with the effects of the
10 environment ([Murayama and Elliot, 2009](#); [Papaioannou et al., 2004](#)) we recommend the
11 investigation of the interactive effects of school climate and teachers' goals on teachers'
12 behaviours before making conclusions about the usefulness of teachers' performance
13 approach goals.

14 In this study teaching experience was negatively related with implementation of the
15 new curriculum and with most determinants of this behaviour. The low negative relationship
16 between mastery orientation and years in education maybe emerged because this scale was in
17 the same set of questionnaires with scales measuring competence in the new curriculum and
18 therefore they responded in mastery items having in mind the implementation of the new
19 curriculum. The present data are in agreement with the cumulative research evidence
20 suggesting that years of teachers' professional experience is rather an obstacle for the
21 adoption of a new curriculum ([Curtner-Smith 1999](#); [Ghaith and Yaghi 1997](#); [Guskey and](#)
22 [Passero, 1993](#); [Retelsdorf et al., 2010](#)). Changing a habitual practice which has been adopted
23 for many years in a profession is very difficult, especially when someone is not totally
24 convinced about the usefulness and the value of the new practice and when he/she is not
25 appropriately trained for this change. Our findings do not necessarily demonstrate that
26 teachers suffer a lose of motivation, they maybe just decide to ignore reform for a number of
27 other reasons that were not measured here. Future research should investigate what determines

1 centered. This has been very well articulated by Byra (2006, p. 451-452) who classified the
2 command and practice styles as the only teacher-centered teaching approaches.

3

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Table 1
Alphas, Means, Standard Deviations of TPB, SET, AGT variables, Correlations among TPB, SET, AGT factors, and Pearson correlations between teaching experience and TPB, SET, AGT variables

<i>New Variables</i>	Cronbach α	<i>M</i>	<i>SD</i>	Range of scale														
					1	2	3	4	5	6	7	8	9	10				
1.Past behaviour	.98	6.88	3.37	1-13														
2.Intentions	.93	5.61	1.50	1-7	.57***													
3.Attitudes	.93	5.69	1.21	1-7	.35***	.71***												
4.Self-efficacy in teaching plans	.91	7.05	2.48	1-11	.35***	.42***	.16*											
5. Self-efficacy in student-centered teaching styles	.82	5.86	2.11	1-11	.30***	.42***	.30***	.50***										
6. Self-efficacy in promoting students' self-regulation	.91	6.37	2.00	1-11	.32***	.26***	.27***	.36***	.56***									
7. Mastery	.71	4.35	.53	1-5	.21**	.25**	.12	.12	.07	.21**								
8. Performance approach	.87	2.51	1.0	1-5	.17**	.02	.03	.08	.18**	.14*	.20*							
9. Performance avoidance	.83	2.41	.88	1-5	.02	.04	.07	-.05	.08	.06	-.07	.39***						
10. Social approval	.84	4.05	.77	1-5	.20**	.26***	.20**	.10	.03	.13	.54***	.45***	.25***					
11. Years in education	-	12.58	8.3	1-35	-.14*	-.22**	-.18**	-.17**	-.25**	-.23**	-.13**	.07	.08	.01				

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

Figure 1

Factor structure in confirmatory factor analysis

Note: Diagrams in oval shape indicate latent variables, in square shape indicate observed variables and in circles indicate errors.

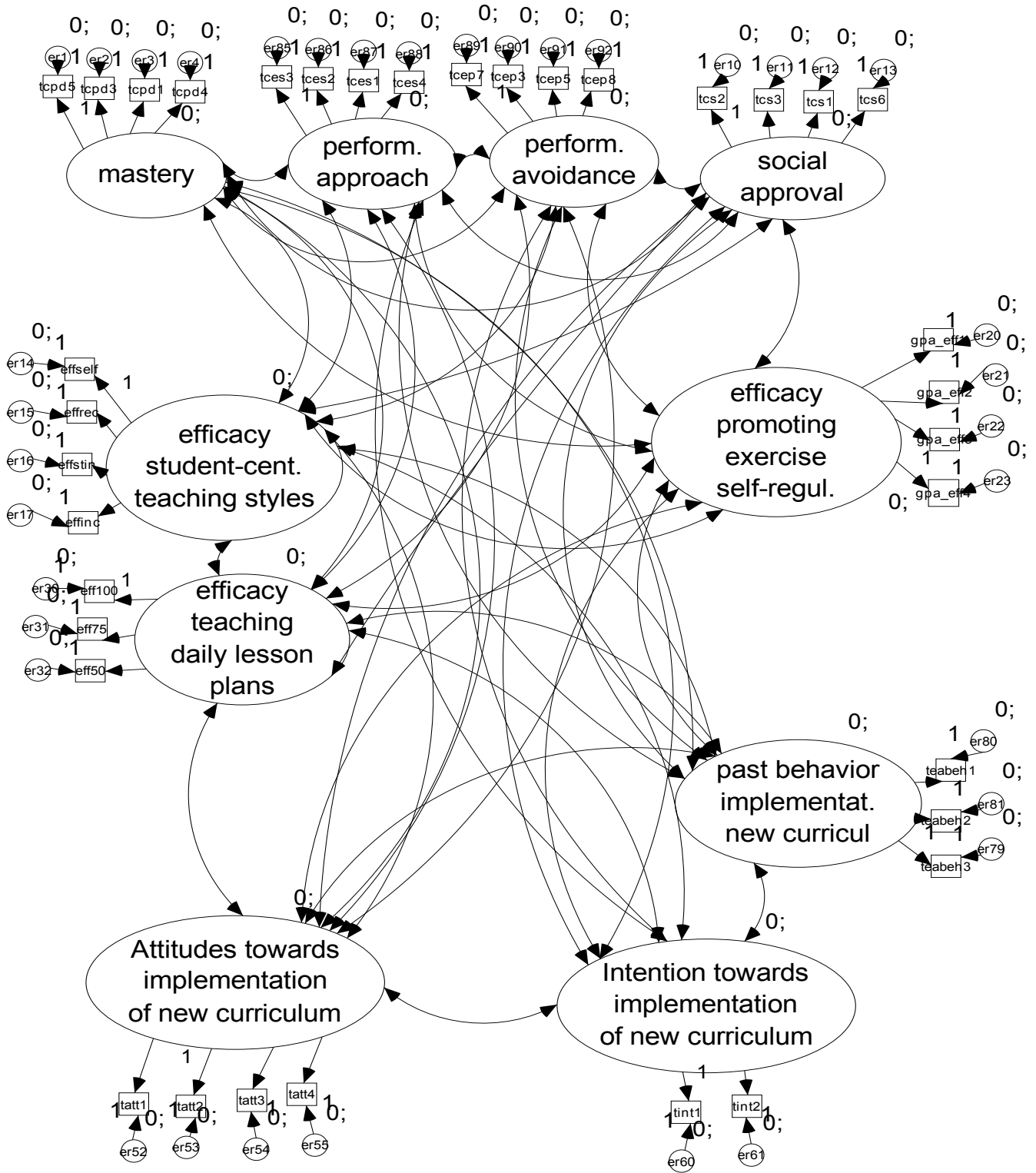


Figure 2

Path diagram explaining the effects of self-efficacy and goal orientation variables on implementation of the new curriculum in the last academic year.

Note: Diagrams in oval shape indicate latent variables, in square shape indicate observed variables and in lines indicate errors. Numbers next to straight arrows indicate standardized regression weights and numbers next to curved arrows indicate correlations. Numbers in bold and italics indicate squared multiple correlations. Numbers next to curved lines indicate correlations. All regression weights were statistically significant, ($p < .001$, but the regression weights indicating the effect of mastery goal, $p = .007$, and the effect of performance approach goal, $p = .004$).

Figure 2

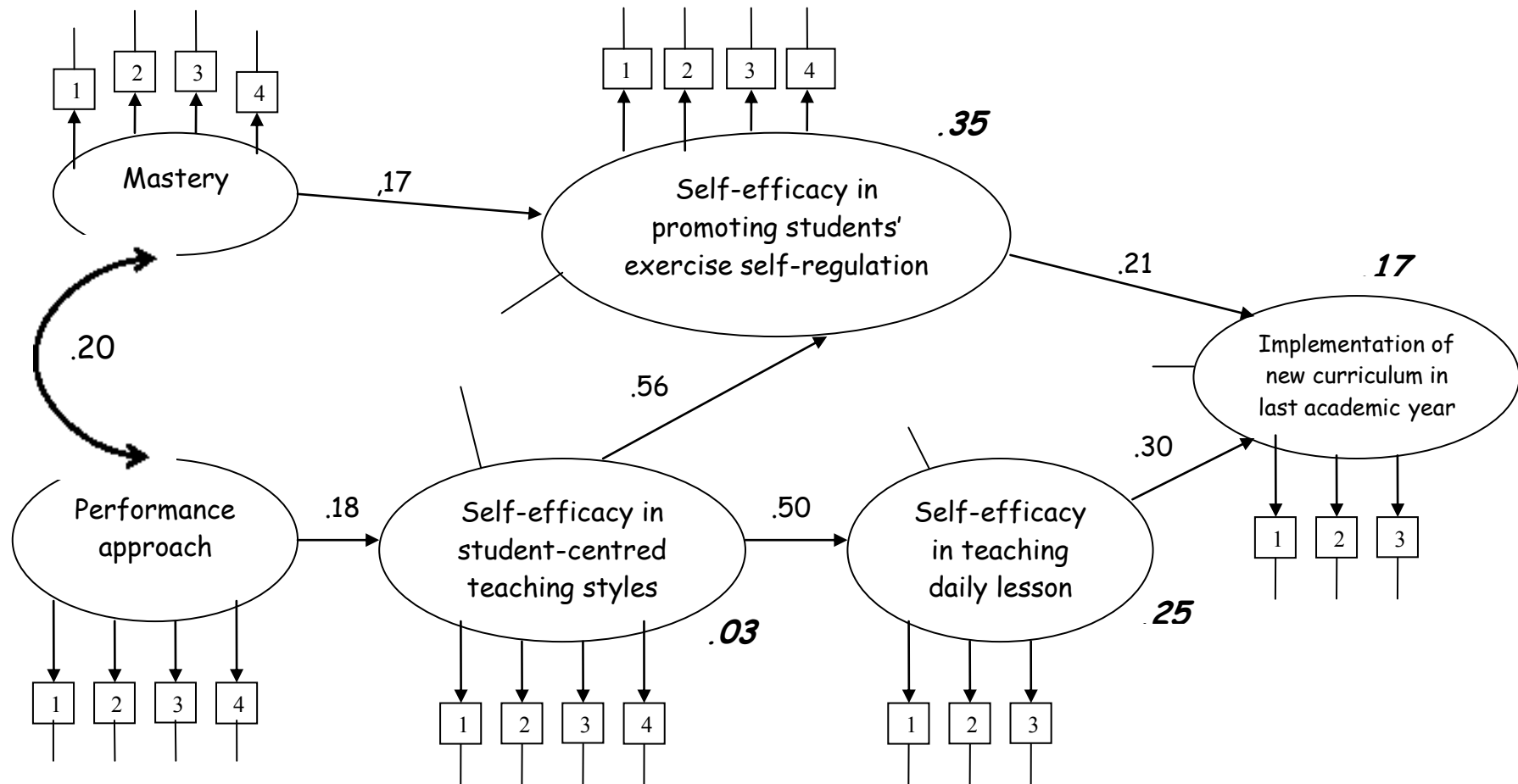


Figure 3

Path diagram explaining the effects of attitudes, self-efficacy and goal orientation variables on intention to implement the new curriculum in the following academic year.

Note: Diagrams in oval shape indicate latent variables, in square shape indicate observed variables and in lines indicate errors. Numbers next to straight arrows indicate standardized regression weights and numbers next to curved arrows indicate correlations. Numbers in bold and italics indicate squared multiple correlations. Numbers next to curved lines indicate correlations. All regression weights were statistically significant, ($p < .001$; but the regression weights indicating the effect of mastery goal, $p = .004$).

Figure 3

