

What do Greek physical education teachers know about elementary student assessment?

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ABSTRACT

Derri V, Avgerinos A, Emmanouilidou K, Kioumourtzoglou E. What do Greek physical education teachers know about elementary student assessment? *J. Hum. Sport Exerc.* Vol. 7, No. 3, pp. 658-670, 2012. The purpose of the study was to investigate whether teachers' knowledge of student assessment was influenced by their gender and if it was related to their teaching experience (years in education). One hundred and twenty six physical education teachers (n=126) who teach in different Greek public elementary schools, participated. Their teaching experience ranged from one to 24 years (M=10.45, SD=5.9). Participants' knowledge of student assessment was assessed via a multiple choice questionnaire. Independent samples t-test and Spearman rank order correlation were conducted in order to explore the impact of gender on teachers' knowledge and the relation between the latter and teaching experience, respectively. Descriptive statistics showed deficiencies in teachers' knowledge. Results indicated that females presented higher knowledge scores than males, although marginally non-significant. Marginally non-significant was also the negative correlation between teaching experience and teachers' knowledge. It seems that gender and teaching experience play a role on teachers' knowledge of student assessment, as measured in the present research, in favor of the females and the teachers with less teaching experience. These findings could be taken into consideration for further research as well as for teacher training on student assessment. **Key words:** GENDER, TEACHING EXPERIENCE, KNOWLEDGE, PHYSICAL EDUCATION, STUDENT EVALUATION.

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INTRODUCTION

The movements of constructivism (Vygotsky, 1978), critical thinking (Bruner, 1997) and holistic approach influenced the theoretical orientation of the curricula and school practice, and led to alternative teaching approaches (Wineburg & Grossman, 2000). These movements are also evident in the framework of the educational reform, entitled “New School: The Student First” by the Greek Ministry of Education, Lifelong Learning and Religious Affairs (2011a). In the context of this reform, new educational curricula have been prepared for the physical education lesson, among all schooling content subject matters. The new pilot curricula, following an international practice (e.g., Government of South Australia, Department of Education, Training & Employment, 2001; National Association for Sport and Physical Education; NASPE, 2004), are standard-based and clearly describe the fundamental knowledge and performance skills required by the teachers in order to implement them successfully, and promote student learning. The corresponding Educators' Manual also provides teachers with detailed information and examples regarding lesson programming, content selection/creation, teaching strategies, and student assessment methods (Ministry of Education, Lifelong Learning & Religious Affairs, 2011b, 2011c).

Student evaluation is one of the critical aspects involved in establishing the educational quality. As a mechanism, it is a continuous monitoring and intervention in structuring the educational quality of the school. It is also a key component of effective teaching (Good & Brophy, 1986). According to NASPE (2009), teachers should understand and use students' assessment to foster their physical, cognitive and emotional development. Under this point of view, student assessment was defined as one of the elements in which physical education teachers should receive training.

The adoption of alternative teaching approaches influenced the perceptions of researchers and teachers on student assessment, since it is considered integral part of the teaching process. As such, student assessment assists in verifying the achievement of the learning objectives, as they are defined in the curricula of each course. According to Melograno (2006), literacy refers to alternative forms and techniques of student assessment and evaluation. Melograno claims that the foundation for developing assessment literacy is directing teacher knowledge on assessment for learning (formative assessment), assessment of learning (summative assessment) and authentic assessment to measure student achievement. Based on this perspective, student assessment forms such as formative, summative and alternative evaluation techniques that are presented in the literature (Wood, 2003) have been adopted in the new Greek curricula of elementary and secondary physical education. These techniques are described in detail and accompanied by examples for each grade in the respective Educator's Manual (Ministry of Education, Lifelong Learning & Religious Affairs, 2011b, 2011c).

In other countries, like United States of America, since the decade of the 1980s great emphasis was placed on the quality of student assessment at classroom level. Standards for teacher competence in the educational assessment of the students were developed to specify teacher skills in this area. Correspondingly, survey instruments were used to evaluate pre-service and in-service teachers' literacy in student assessment (Campbell et al., 2002; Mertler, 2003; Mertler & Campbell, 2005; Plake, 1993). However, the above research evidence indicated deficiencies on teachers' knowledge for student assessment. To improve teachers' competence in this area, courses and professional development programs were successfully developed and applied (e.g., Mertler, 2009; O'Sullivan & Johnson, 1993; Rockman et al., 2004; Sato et al., 2008).

In Greece, a research conducted by the Pedagogical Institute (2004) revealed that primary school teachers' attitudes towards the new alternative assessment approaches were not positive. This finding might be attributed to the lack of adequate training and pedagogical guidance on this subject. Especially in the field of physical education, the absence of reference and guidelines for evaluating and grading students in elementary school, led to a lack of teacher's knowledge.

Since 2006, with the release of the new books-manuals for the physical education teachers in primary and secondary education, there were for the very first time references to the necessity and the importance of students' assessment. Terms like "qualitative" and "quantitative", as well as modern terms like "authentic", "formative" and "summative" assessment appeared in the curriculums and teachers' books. For instance, in the first and second grades' manual (Burnelli et al., 2006a) there are few examples of qualitative and quantitative assessment for some fundamental movement skills and concepts, through check lists. In third and fourth grades (Burnelli et al., 2006b), apart from the above information, there is an example of authentic assessment, via a check list. Diagnostic, summative and formative assessment (explanations of each term), along with an example that combines these three assessment types, are presented. In fifth and sixth grades (Digelidis et al., 2006), there is a great number of examples for motor and cognitive assessment of student performance in sports, mainly through check lists and oral questions, respectively, as well as some suggestions for the assessment of the emotional domain.

However, it appears that there is a lack in the continuity and consistency of the information provided among grades, regarding student assessment. Also, the guidelines, for the most part, are general and not targeted to the assessment of specific objectives in physical education (motor, cognitive, affective) that should be achieved in each grade. Accordingly, there is no reference to the traditional and alternative assessment, and the techniques (task organization, team projects, portfolio, etc.), tools (rubrics, rating scales), and methods (norms, criteria) of the latter. With regard to the criteria of student assessment, the information is limited to the way they are determined. A lack in the techniques of formal and informal student assessment is also apparent.

Furthermore, it was not earlier than the decade of the 2000s that university departments of physical education, through their courses and assignments, started to provide teacher candidates with multiple experiences of using and creating student assessment tools, and analyzing the assessment results. Consequently, the majority of more experienced in-service physical educators, in terms of teaching practice, had not attended related courses during their undergraduate studies. As a result, they used to assess and grade their students based on their effort and participation in classroom activities (Ikonomopoulos et al., 2004), criteria which are both difficult to be measured, unreliable and inconsistent with the educational goals of physical education.

In line, in the study of Chatzopoulos & Mouratidou (2004), elementary physical education teachers select and use different evaluation criteria such as effort and individual student progress, comparison of performance among students, or a combination of the above. In addition, official training programs are not being developed, based on research evidence for in-service teachers' strengths and weaknesses in knowledge and performance skills (e.g., Karofillaki et al., 2001; Tsafos & Katsarou, 2000). Nevertheless, this is considered to be of crucial importance in the training programs planning (Gravani, 2003; John & Gravani, 2005). In turn, the lack of teachers' initial assessment in such training programs prevents official efforts from evaluating their effects on teachers' knowledge and performance.

In fact, the evaluation of such parameters mainly relies on individual research studies that evaluate the existing training programs (e.g., Gorozidis & Papaioannou, 2011) or implement and evaluate new ones (e.g., Vassiliadou et al., 2009). However, such evidence could assist in designing successful training programs for the physical education teachers, in relation to their needs. Besides, all participants in the study of John & Gravani (2005) believed that professional development is vital because practice is not adequate to cover all learning elements.

Research studies, although limited in relation to teacher knowledge, yielded contradictory conclusions concerning the effect of teachers' gender and experience on their knowledge and skills. Specifically, Al Khatib (2007) indicated that gender, contrarily to teaching experience, plays a significant role to teachers' knowledge of learning disabilities, in favor of females. Similarly, studies conducted in elementary school physical education revealed differences between male and female teachers in student evaluation (e.g., Hopf & Hatzichristou, 1999; Kulinna et al., 2006), in favor of the latter. Moreover, teachers with more years of teaching experience were found to teach more content elements of the curriculum to the students (e.g., Kulinna et al., 2006).

Ikonomopoulos et al., (2001), examining the perceptions of elementary school physical education teachers in the subject of student assessment and grading, revealed that teachers' perceptions were influenced by their teaching experience and training in this subject, but not by gender. Similarly, Papatheofilou et al. (2008) found that female teachers' perceptions of their practices in student assessment were higher than their male colleagues, although not significantly. In line, in the study of Vassiliadou et al. (2004), no significant differences were found, in terms of gender, in qualitative aspects of teaching and the use of instructional time, but male teachers exhibited better performance.

Teaching experience was also unrelated to teaching elements such as time management, teaching behaviors and feedback provision to students (Carreiro Da Costa & Pieron, 1992). In contrast, in the study of Gorozidis & Papaioannou (2011), teaching experience was negatively related to the implementation of the Greek physical education curriculum in high school which was released in 2006, to all examined variables of Theory of Planned Behaviour and Self-efficacy Theory, and to mastery goal as well.

The recent educational reform in elementary physical education in Greece (Ministry of Education, Lifelong Learning & Religious Affairs, 2011b, 2011c), the aforementioned research findings, and the absence of results from evaluating physical education teacher's knowledge, especially on student assessment, guided the design of the present study. Therefore, its purpose was to investigate whether teachers' knowledge of student assessment was influenced by their gender and if it was related to their teaching experience. The following questions were posed as framework of the study:

- To what extent do Greek physical education teachers know about techniques, tools, concepts, elements and types of student assessment?
- Does teacher's gender affect knowledge on student assessment?
- Is teaching experience related to knowledge on student assessment?

MATERIAL AND METHODS

Participants

One hundred and twenty six physical education teachers, 65 males (51.6%) and 61 females (48.4%), who teach in different Greek public elementary schools, participated in the study. Their teaching experience ranged from one to 24 years ($M=10.45$, $SD=5.9$). Participants were selected during two conferences, one Pan-Hellenic in Thessaloniki and one International in Komotini, and their participation was voluntary.

Instrument

Participants' knowledge was assessed via a questionnaire (Emmanouilidou, Derri, Aggelousis, & Vassiliadou, 2012) which consisted of 17 multiple choice items. The test items are related to techniques (6), tools (2), concepts (3), elements (2) and types (5) of student assessment in elementary physical education. Each item consisted of a stem in the form of an incomplete sentence and five alternative responses, one correct, three incorrect and an "I do not know". It includes items as for instance: 1) A technique of authentic student assessment is ... a) observation of performance during drills, b) standardized test of sport skills, c) written test of understanding sport skills and strategies, d) observation of performance in real-life situations, e) I do not know, 2) Formative assessment monitors students' performance ... a) during a module b) at the end of the term, c) at the end of a module, d) at the beginning of a module, e) I do not know. The mean of item difficulty and discrimination indexes were 0.47 and 0.37 respectively. For difficulty indexes, values between 0.30 and 0.70 are recommended (Safrit & Wood, 1995). For discrimination indexes, values of >0.20 are considered acceptable and ≥ 0.40 very good (Kirkendall, 1987; Safrit & Wood, 1995). The internal consistency of the test was adequate (Cronbach's $\alpha=0.67$) and its stability, according to test-retest reliability, was high ($ICC=0.91$).

Procedure

Teachers were assured that the study was conducted for scientific purposes only and that their responses were confidential and anonymous. They were also required to respond to all items to the best of their knowledge. Then, they completed the questionnaire within half an hour in the presence of a researcher. Only the correct responses were calculated in the present study. Each correct response was graded with one point. The possible score of the test ranged between zero and 17 points.

Data analysis

Descriptive statistics were used for the calculation of the percentage of correct responses. An independent samples t-test was conducted in order to explore the impact of gender on participants' knowledge, as measured by test scores. Spearman Rank Order Correlation was also used to describe the strength and direction of the relationship between teaching experience and scores of knowledge test. Non-parametric correlation was used because preliminary analysis ensured violation of the assumption of normality. The statistical package of SPSS 15 was used for data analysis.

RESULTS

The percent of participants who correctly answered each of the 17 items comprising the knowledge test is showed in Table 1. The percent of correct responses to each item ranged from 21.4% to 66.7%. The mean score obtained by teachers on the total test was M=7.56 (44.5%), SD=3.16.

Table 1. Percentage of participants who answered correctly each item of the knowledge test.

Issues of questionnaire items	Correct answers
1. The meaning of assessment	51.6%
2. Norm-referenced assessment	52.4%
3. Cognitive elements assessment	31%
4. Quantitative assessment	53.2%
5. Alternative assessment techniques	42.1%
6. Domains of physical education student assessment	57.1%
7. Criterion-referenced assessment	38.9%
8. Authentic assessment	21.4%
9. Motor elements assessment	42.1%
10. Formative assessment purposes	26.2%
11. Informal assessment	29.4%
12. The purpose of student assessment	66.7%
13. Tools for social assessment	64.3%
14. Tools for cognitive assessment	38.1%
15. Assessment of cooperation	61.1%
16. Types of cognitive assessment	28.6%
17. Student peer-evaluation	52.4%

As it can be seen in Figure 1, 38.9% of the teachers responded correctly to 6 or less than 6 items, 50.8% responded correctly 7 to 11 items, and only 10.3% responded correctly to more than 12 items out of 17.

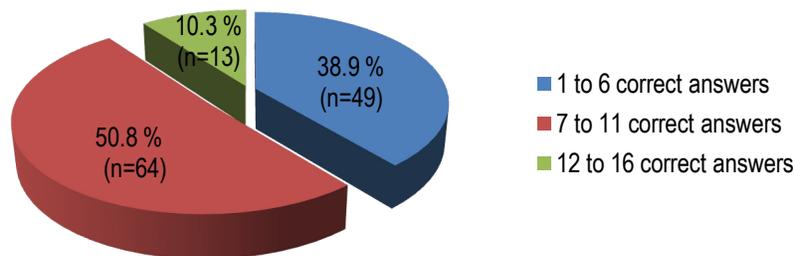


Figure 1. Percentage of participants with correct answers.

The scores of female and male teachers are presented in Figure 2. With regard to the effect of gender, results from the independent samples t-test revealed differences in knowledge scores between males ($M=7.05$, $SD=2.53$) and females ($M=8.11$, $SD=3.66$), which were marginally non statistically significant, $t(124)=1.89$, $p=0.06$.

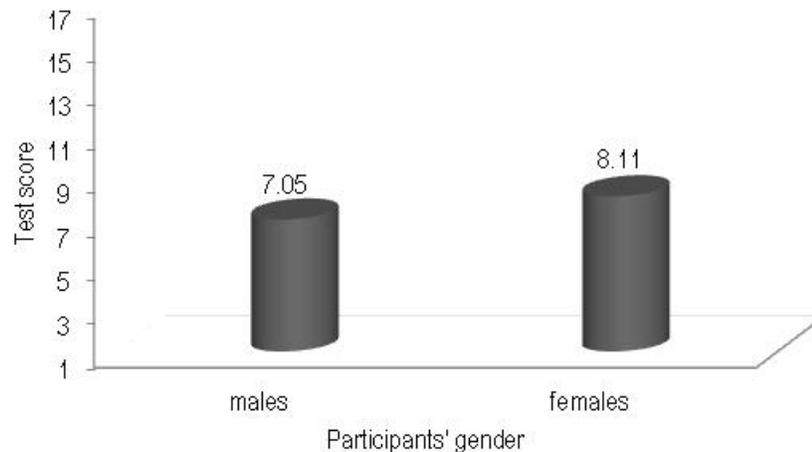


Figure 2. Male and female teachers' scores.

Results from correlation analysis yielded a small negative, marginally non-significant correlation between teaching experience and performance in the knowledge test ($\rho=-0.16$, $p=0.06$).

DISCUSSION

The purpose of the study was to investigate whether teachers' knowledge of student assessment was influenced by their gender and if it was related to their teaching experience. Given that student assessment is an integral part of a quality physical education lesson, educated teachers should realize the function of assessment methods, know their characteristics and be able to apply those, using appropriate techniques, to facilitate and improve student achievement.

Based on the descriptive statistics, the percentage of correct answers on student assessment ranged from 6 to 94% with an average 44.5%, meaning that fewer than half of the questions were correctly answered. Also, more than half of the participants seemed to be acknowledged of the general concept of assessment and its purposes, the domains of physical education that should be assessed, and students' benefits of peer-evaluation engagement. It is possible that this occurred because all the elementary teachers' books released in 2006 included information about the purpose, significance, and benefits of student assessment (e.g., Burnelli et al., 2006a, 2006b; Digelidis et al., 2006). On the other hand, the rest of the participants might have chosen not to change their student assessment practices, and this resulted in a lack of knowledge on the subject.

Although more than two third of the respondents were aware of the social domain assessment tools, only about one third were aware of tools (oral questions, check lists, interviews, logs) to assess elements of the cognitive domain of physical education. Also, less than half of them were acquainted with the cognitive and motor elements they should assess. It is possible that knowledge about social student evaluation was developed in related educational programs targeted on social aspects of physical education, such as Kallipateira (Ministry of Education, 2008) which had been implemented in Greece, and through the related teachers' books (e.g., Derri & Avgerinos, 2008). Some of the teachers in this study may have participated in such training. Although teachers usually assess their students' motor and cognitive performance, their unawareness of the tools and elements in these domains could be attributed to that these are not developed clearly and consistently in their books/manuals or even to their unwillingness to learn and apply them.

Moreover, few of the physical education teachers understand terms such as "formative" and "authentic" assessment which are essential in learning and are also recommended in the new pilot physical education curricula in Greece (Ministry of Education, Lifelong Learning and Religious Affairs, 2011b, 2011c). As it has already been mentioned, such terms are also included in the existing teachers' books from third to sixth grade. Therefore, their limited development and the absence of a variety of examples in each grade might have contributed to the poor teachers' knowledge about them. Another possible explanation is that these assessment techniques require more specific knowledge, beyond the significance and benefits of assessment, which probably has not been acquired by the teachers yet. Apparently, professional development programs are necessary to be developed and implemented in order to assist in enhancing teachers' knowledge of student assessment.

Regarding the effect of gender on teachers' understanding, results showed that female participants outperformed their male colleagues, whereas their differences were marginally non-significant. This result could be linked to the better communication skills of female teachers, which enable them to convey their expectations to the students, assess their knowledge, and convey new knowledge to them effectively (Hogan, Rabinowitz, & Craven III, 2003), as well as to their better relationships with the students (Opdenakker & Damme, 2006).

This finding seems to confirm and replicate the finding of Al Khatib (2007), who, probably due to the larger sample, reported significant differences in teachers' knowledge of learning disabilities, in favor of females. The superiority of female physical education teachers, with regard to their beliefs on student assessment and grading, was also indicated in the studies of Ikonmopoulos et al. (2001) and Papatheofilou et al. (2008).

The decrease of teachers' knowledge on student assessment, in this study, is reflected to its negative relation with teaching experience. It has been indicated that teachers with many years in education assess student comprehension throughout the entire lesson and tend to ask them higher-order thinking questions. Also, these teachers select better and various strategies to assess students' prior knowledge, and, in turn, they facilitate students' understanding, connecting their new to prior knowledge, through a variety of links (Sánchez et al., 1999). However, it has to be taken into account that teaching experience has been found to relate negatively to the implementation of a new physical education curriculum in Greece (Gorozidis & Papaioannou, 2011). As all the participants in the present study were involved indeed in that new curriculum, the above negative relation may indicate that teachers' experience operated as a barrier for its

adoption (e.g., Curtner-Smith, 1999; Retelsdorf et al., 2010) and, in this case, for the enhancement of their knowledge in contemporary student assessment processes.

The negative relation between teaching experience and teachers' attitudes toward such innovations was also revealed in the studies of Ma et al. (2009) and Rosenblatt (2004). It seems that teaching experience loses its power when adopted practices for many years are required to change, and participants' training is not adequate for that. Also, the most recent studies at the University or the participation in the contest of the Superior Council of Personnel Selection (ASEP), as a condition of employment in education in Greece, might have assisted less experienced teachers' performance in the knowledge test. Although not directly comparable, this result seem not to align with previous reports, that teaching experience has no effect on teachers' knowledge of learning disabilities (Al Khatib, 2007) or it is unrelated to teaching elements such as feedback provision to students (Carreiro Da Costa & Pieron, 1992), which is straightly linked to student assessment.

The findings of the present study could provide preliminary information to those who are responsible for designing and implementing training programs for the physical education teachers, according to their needs. Teachers' involvement, motivation, and adequate training and evaluation in such processes are considered of crucial importance, especially for males and more experienced teachers, in terms of years in education. Besides, as Sandholtz (2002) suggested, teachers appreciate their engagement in active learning, through exploration, reflection, and collaboration with colleagues. Through this process, teachers are expected to adopt the educational innovations, proceed with changes in their practice, and contribute to a successful physical education reform. Specifically, gaining knowledge and skills for student evaluation, teachers will ascertain the achievement of the physical education goals, enhance students' motivation and contribute to their overall development. The teachers will also be able to know and set specific learning criteria, according to the lesson's goals and utilize various and objective ways of their assessment. This will lead teachers to draw better conclusions for performance in physical education which is related not only with student participation in physical activity for a lifetime but also with their emotional and social development.

In this study there are some limitations that might have influenced its findings. One limitation is the use of a multiple choice format in answering the test items. Although this type of tests is used because they are more affordable with a large number of participants, a random answer may have a chance of receiving a point. Also, a larger sample could establish better the findings. Moreover, the training programs implemented in issues related to physical education such as Kallipateira (e.g., Derri & Avgerinos, 2008), might have helped some of the teachers who participated in this study to gain knowledge about student evaluation. Future studies in Greece are necessary to examine a larger sample of physical education teachers in terms of their knowledge with more comprehensive tests as well as their teaching practice with observation tools, to address the aforementioned issues and contribute to the most in teachers' improvement.

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