Research Paper

The intrinsic motivation of sixth graders in Cypriot primary schools in the class of physical education in volleyball

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ABSTRACT

One of the goals of education is to make a positive contribution in creating people who are familiar with the functions of personal learning and who will make the most of them when needed. To achieve this, intrinsic motivation is needed, namely, the motivation to participate in an activity for the fun and the satisfaction which results simply from participating in it, without the presence of external rewards. The overall purpose of the present study was to examine which teaching method, Direct Instruction, Self-Regulation, Practical Instruction, or Guided Discovery, had the most impact on the student's intrinsic motivation in the Natural Sciences, in the volleyball category. For the purpose of quantitative research, 427 Sixth Grade Primary School students from Lemesos, Cyprus participated. Intrinsic motivation was measured using the IMI (Intrinsic Motivation Inventory), by McAuley et al. (1989), with 17 questions on a 5-point Likert-type scale. The validity of the tool was checked by confirmatory factor analysis. The adjustment indices showed that the adaptation of the validity model to the survey data was satisfactory (CFI=0.92, \( \chi^2=324.76 \), df=428, \( \chi^2/df=0.76 \), RMSEA=0.003). Factor loadings ranged from 0.50 to 0.70 and loaded into three factors: General Intrinsic Motivation, Perceived Competence and Effort, and Pressure and Tension. The reliability of the tool was assessed by Cronbach's Alpha analysis with \( \alpha=0.71 \). Intrinsic motivation was tested by the one-way analysis of variance (ANOVA), which showed a statistically significant difference between the four interventions, \( F=3.42, p<.001 \). On the basis of multiple comparisons, Direct Instruction (M.O=3.56), Self-Regulation (M.O=3.54), and Guided Discovery (M.O.=3.53) were statistically better than Practical Instruction (M.O.=3.26), \( p<0.05 \). In conclusion, students need a rotation between teaching interventions in order to develop intrinsic motivation.

Key words: Intrinsic motivation, teaching methods, physical education.

INTRODUCTION

Undoubtedly, teaching methods influence the way students think and act. Therefore, an interactive relationship is created between these two determinants. This interactive relationship entails an increase in self-regulation and in the use of metacognitive processes. During the teaching process a special human relationship develops, a relationship with many dimensions affecting both the student and the teacher at the same time. They are both witnesses of a tacit agreement about sharing information, transferring and acquiring knowledge, copying and reproducing things that humans have invented in the past, devising and acquiring new ones, visualizing and creating...
ways to explore the unknown. This relationship encourages the development of feelings for one another - feelings of cooperation or conflict, acceptance or rejection, anger or joy. This invites both the student and the teacher to engage in a unique social relationship that has its own hierarchy, its own rules and its own responsibilities (Mosston and Ashworth, 1994).

The method of direct instruction

The Direct Instruction method is a reproductive teaching method, a pattern imitation method, where the teacher makes the decisions and the student follows them.

The method of practical instruction

The method of Practical Instruction is also a reproductive method of teaching. It is the teacher who makes all the decisions at both the preparation and evaluation stages of the teaching, while the student is given the responsibility to make some decisions at the stage of the implementation of the process.

The method of self-regulation

The Self-Regulation method is a reproductive method as well in which the students themselves, with the help of a criterion card, exercise and monitor their skills.

The method of guided discovery

The Guided Discovery method is a productive method where the teacher poses a problem and guides the student with questions towards a particular solution.

The research by Curtner-Smith et al. (2001) examined Physical Education teachers regarding which teaching method they used the most. Physical education teachers appeared to use mainly reproductive teaching methods. It also showed that they used the Practical Instruction method more often and invested much less time in its implementation. They essentially used the teaching methods to improve their students' abilities, but they rarely made assessments and evaluations of their actions and choices. On very few occasions did they vary the content of their lessons and they did not offer their students the opportunity to work independently. The most important factor that makes teachers choose these methods is the difficult behavior of some students and because of the minimal time available for Physical Education, the selection of productive teaching methods is considered practically impossible (Evans and Penney, 1993).

Other research, such as that of Curtner-Smith (1994), has shown that other factors that influenced teachers in the selection and application of mostly the Practical Instruction teaching method were school experience, previous activities of Physical Education teachers, their education and the influence of their colleagues. This position is reinforced by the belief of Syrmpas and Digelidis (2014), who argue that teachers are willing to use reproductive methods and confirm that their perceptions on teaching are influenced by their past experiences as students. There is also research evidence that suggests that these methods are more favorable to charismatic students, who are usually the minority in a classroom (Goldberger, 1991).

In addition, the teacher tends to apply the same lesson methodology, without taking into account the particular characteristics of each classroom. This contradicts the view of Mosston and Ashworth (1994), who argue that each teaching method plays a separate role in achieving its objectives, which is why each method is equally important.

Intrinsic motivation

Intrinsic motivation is the motivation for one to engage in an activity in order to have fun and to be satisfied by participating in it, without the presence of external rewards.

More specifically, motivation refers to the direction and intensity of a behavior (Weinberg and Gould, 1999). The direction of a behavior refers to: a) approach (what one chooses to do), b) maintaining and c) abandoning an activity. Intensity refers to the magnitude of effort, that is, to what extent one deals with something.

In other words, the term motivation refers to the behavior we can observe. This is with reference to a student’s interest in an activity or even a lack of interest in one. Whereas motive is the cause of the expression of interest; it is the driving force behind a behavior where we can only guess what the motive might be. However, we can never be truly sure of the motive behind the behavior. Usually, it is a complex of motives that leads to a particular behavior.

Types of motivation

Motivation has been separated by Deci and Ryan (2000) into three main types: Intrinsic Motivation, Extrinsic Motivation, and Amotivation (lack of motivation). Intrinsic Motivation is characterized as the motivation that comes from internal sources and internal motives. It is the one which guides behaviors that manifest themselves to please and satisfy a person and derives from their execution, without expecting to acquire material goods, that is, without expecting something in return. Deci (1975) has defined intrinsically motivated behavior as being motivated by the innate need of the individual to feel capable and
autonomous in the environment in which they live. He offers as an example, a child playing and being completely absorbed by their game, as having intrinsic motivation because they do not play to gain something in return, or an external reward. Another example of intrinsically motivated behavior is when students participate in a Physical Education lesson, either because they love Physical Education, because they enjoy participating in new activities, or because they enjoy playing sports.

Intrinsic motivation as the preferred form of motivation

Previous studies in the field of Psychology have shown both in theory and in research that in education, a high degree of intrinsic motivation has more advantages than extrinsic motivation (Gottfried, 1985; Ryan and Connell, 1989; Vallerand and Bissonnette, 1992). One of the benefits of intrinsic motivation is that it helps students learn more effectively and in a deeper way through increased performance. Research showed that children who were highly motivated internally had higher success rates in various disciplines (Gottfried, 1985).

Therefore, it seems that higher intrinsic motivation increases the chance for a person to engage in physical activity in the long run. According to the research by Vallerand and Bissonnette (1992), intrinsically motivated students persisted regardless of their performance in a course, as compared with extrinsically motivated students.

The last major advantage of Intrinsic Motivation is that it helps students adapt better in school. Positive emotions are triggered towards the Physical Education class and towards their classmates. There is also a decrease in stress levels and a more effective coping with the difficulties present in the school community (Ryan and Connell, 1989). Other research done in the field of Physical Education, such as that of Papaioannou and Theodorakis (1996), showed that intrinsically motivated individuals continued doing physical activity later on. Finally, a positive relationship was observed between intrinsic motivation and students’ intention to participate in future exercise programs, according to Goudas et al. (2001).

The categories of intrinsic motivation

In Intrinsic Motivation, one engages in an activity because they derive pleasure from it. For example, a child plays soccer because he or she likes to play that particular game, without aiming for a reward external to the activity. In Intrinsic Motivation, one feels that their actions are completely controlled by themselves. That is, their actions are self-regulating and they feel that the reason for their mobilization is internal. A person with intrinsic motivation is attached to an activity for enjoyment, without expecting material rewards or needing external coercion (Pelletier et al., 1995).

Intrinsic Motivation could be divided into three categories: a) the knowledge that one participates in so as to be pleased and satisfied with learning, to explore and strive to understand something new, b) the achievement, in order to be satisfied, and to please a person trying to succeed in a project or to create something new; and c) aesthetic stimulation, that is, when the person experiences feelings of joy, excitement and sensory pleasure.

Motivation can help create a climate that promotes action in teaching (Salvaras, 2000). Depending on the direction of the motivation, if the climate in the lesson becomes transactional, then learning is pursued. If the climate becomes competitive, then performance is pursued (Papaioannou et al., 1999; Trilianos, 1999). Students’ worthiness influences students’ motivation, that is, their perceptions of the value of their abilities (Koliadis, 1997) and of the various teaching strategies used in the Physical Education lesson (Mosston and Ashworth, 1997).

For example, students’ assessments of their ability expectation, that is, how they judge and evaluate their performance, and the outcome expectation, namely, how they assess the consequences, determine students’ effort and their performance. Students who have a positive image of themselves always strive to achieve a goal or overcome an obstacle. For students, however, who are dominated by unworthiness, the opposite is true (Bandura, 1997).

Summarizing all of the above, it emerges that the importance of motivation in people’s lives is great and even greater for students in Physical Education. It is also necessary to avoid any kind of social comparison and competition between the students in Physical Education lessons, as this causes stress for the children, thereby reducing their motivation (Papaioannou and Kouli, 1999). In addition, in the long run, it might undermine the interest of many students in Physical Education, as they misconstrue Physical Education as addressed to the few and the more capable.

Thus, the overall purpose of the research was to investigate the effect of the intervention program on the research variable under study, namely Intrinsic Motivation. Another objective of the research was to examine which teaching method, such as Direct Instruction (a completely teacher-centered approach), Practical Instruction, Self-Regulation (moving away from a teacher-centered approach), or a Guided Discovery approach (a more student-centered approach), has more influence on students’ intrinsic motivation in the course of Physical Education.

MATERIALS AND METHODS

Sample

The present study was conducted with Primary school students in the city of Lemesos. A sum of 16 Sixth Grade
classes was selected, with a total of 427 students. The sample was convenient because of the difficulty in obtaining data from schools. The data were collected through a questionnaire distributed to the schools by the researcher himself during Physical Education lessons.

Type of research

For the purposes of this study, a quantitative method was used, since quantitative research was conducted to collect, analyze and present the data. Quantitative research usually involves large-scale measurements.

Intrinsic motivation inventory (IMI)

The tool that has been used to assess intrinsic motivation is McAuley et al.’s (1987) IMI (Intrinsic Motivation Inventory) in Greek translation. To measure students’ intrinsic motivation, the smaller version of McAuley et al. (1987) Intrinsic Motivation Inventory was used, with 17 questions assessing the following factors: a) Interest / Enjoyment, b) Perceived Competence, c) Effort / Importance, d) Pressure / Tension and e) Perceived Choice. The IMI is considered a flexible measuring instrument which can be modified to suit a variety of activities.

Results of research using modified versions report encouraging conclusions about its psychometric properties (McAuley et al., 1989; Kim and Gill, 1996). The validity of the structure and the reliability of the Greek version have been demonstrated in previous studies (Tsigilis and Theodosiou, 2003). For the purposes of the present study, 17 of the 45 questions focusing on 5 factors related to the variables being studied were translated by four different evaluators (two Physical Education teachers, a bilingual Philology teacher and a Primary Education teacher). The final form is the result of consultation with the researchers in the present study. The responses to the questionnaire were on a five-point Likert scale (Strongly agree = 5, Agree = 4, Neither agree nor disagree = 3, Disagree = 2, Strongly disagree = 1).

Procedure

The 16 classrooms were arranged in four groups. Four classrooms were randomly assigned to Control Group or CG (Direct Instruction), four to Experimental Group 1 or EG1 (Practical Instruction), four to Experimental Group 2 or EG2 (Self-Regulation) and four to Experimental Group 3 or EG3 (Guided Discovery). In the first stage, the tool was given to all students before teaching (pre-experimental tests). At the same time, initial skills assessments were carried out in all classrooms. The classrooms that were placed in OE were taught using the Direct Instruction method. The classrooms assigned to PO1 received the Practical Instruction method. The classrooms placed in PO2 were taught using Self-Regulation and the classrooms placed in PO3 were instructed with the Guided Discovery method. All four teaching methods had exactly the same curriculum and there was no change in the students’ warm-up or cool-down exercises after the Physical Education lesson. All the exercises had the same amount of time to be performed. The only change lies in the teaching method, that is, how these skills were taught.

The duration of these teachings lasted two forty-minute periods during the Physical Education lesson (40 minutes X 2 lessons). Since the research was conducted under realistic conditions, the duration of the lessons was deliberately chosen, since it covers the motor skills of this particular “Games” theme, which falls under the five key thematic units of Sixth Grade PE, in which the “Bump” and “Overhand Pass” skills are taught, each of which needs forty minutes (one for each skill). The purpose of the unit is for students to adequately develop basic handling skills in PE in modified Games (Ministry of Education and Culture, 2015).

In the second stage, the students were given the same tool (in parallel structure) in the form of a post-experimental test. The program that was followed in every forty-minute period was common to all groups. First was the warm-up (5 min), followed by teaching (30 min) and finally the cool-down exercises (5 min). This is because the student’s active participation time had to vary, depending on the type of teaching.

RESULTS

The factor structure of the questionnaire was examined through Confirmatory Factor Analysis using MPlus linear structural analysis software (Muthen and Muthen, 2004). Following the Structural Equation Model, the adjustment indices showed that the adaptation of the model validation of the Intrinsic Motivation questionnaire to the data in the present study was satisfactory, confirming the structure of the questionnaire (CFI = 0.92, χ2 = 324.76, df = 428, χ2/df = 0.76, RMSEA= 0.003). The loadings of the questionnaire statements on the factors ranged from 0.50 to 0.70.

From this model, it appears that the statements of the Intrinsic Motivation questionnaire load into three different 1st order factors, as expected. Based on the structure of the model: (a) statements 1, 2, 8, 10, 11, 13, 15 and 17 are indicators of the 1st factor General Intrinsic Motivation, (b) statements 3, 4, 5, 6, 7 and 9 are indicators of the 2nd factor Perceived Competence and Effort and (c) statements 12, 14 and 16 are indicators of the 3rd factor Pressure and Tension. These three factors subsequently load into a 2nd order factor, which is Intrinsic Motivation. The loadings for the three factors, General Intrinsic Motivation, Perceived Competence and Effort and Pressure and Tension are 0.823, 0.712 and 0.605 respectively.
Table 1: Pre and post test.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Avg.</th>
<th>Std. Dev.</th>
<th>Statistical significance(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre_IMI</td>
<td>3.09</td>
<td>0.38</td>
<td></td>
</tr>
<tr>
<td>Post_IMI</td>
<td>3.47</td>
<td>0.56</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Table 2: Results of the one-way analysis of variance in intrinsic motivation.

<table>
<thead>
<tr>
<th>Variable</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrinsic Motivation</td>
<td>128.57</td>
<td>3,424</td>
<td>0.30</td>
<td>3.42</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

Note: SS = Sum of Square, df = Degrees of Freedom, MS = Mean Square

Table 3: Post-Hoc Scheffe multiple comparison testing in intrinsic motivation.

<table>
<thead>
<tr>
<th>Compared groups</th>
<th>CG</th>
<th>EG1</th>
<th>EG2</th>
<th>EG3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg.</td>
<td>-</td>
<td>3.26*</td>
<td>3.54*</td>
<td>3.53*</td>
</tr>
</tbody>
</table>

Note: *p < 0.05.

To investigate the reliability of the epistemological development tool, Cronbach’s alpha analysis was conducted on all 17 statements. The value was 0.71, which is considered highly satisfactory.

Control groups equivalence test (Control Group, Experimental Group 1, Experimental Group 2, Experimental Group 3; Pre-test)

To identify possible differences between the four groups, Control Group (CG), Experimental Group 1 (EG1), Experimental Group 2 (EG2), and Experimental Group 3 (EG3), prior to the instructional intervention, three one-way ANOVA tests were performed with the pre-test performance as the dependent variable and the various Groups as the independent variable [Direct Instruction (CG), Practical Instruction (EG1), Self-Regulation (EG2) and Guided Discovery (EG3)]. There were no statistically significant differences between the four groups and the IMI questionnaire, p> 0.05.

The absence of a statistically significant difference confirms that any changes in students’ post-test scores after the instructional intervention are not due to initial differences between the four groups.

Differences before and after the intervention

The first research question asks whether there are statistically significant differences between the pre and post tests of Intrinsic Motivation. To answer this question, a t-test was performed for dependent samples between the pre and post tests. There appeared to be a statistically significant difference, as shown on Table 1.

In more detail, it seems that the implementation of any intervention has a positive effect on the Intrinsic Motivation factor under consideration.

Development of intrinsic motivation after instructional intervention

The second research question relates to which teaching method (CG, EG1, EG2, EG3) has a greater degree of efficacy in the development of intrinsic motivation for children in the Physical Education lesson after instructional intervention. To explore the question, a one-way ANOVA analysis was carried out using the post-test average as the dependent variable of Intrinsic Motivation and the four interventions as the independent variable, to show which intervention was statistically better. The analysis showed a statistically significant difference between the four interventions, F = 3.42, p < 0.001 (Table 2).

Subsequently, a post-hoc Scheffe Test was used to determine which intervention had a statistically significant difference. The analysis showed that EG2 (Avg. = 3.54) and EG3 (Avg. = 3.53) were statistically better than EG1 (Avg. = 3.26), p < 0.05 (Table 3).

Statistical analysis of the second research question showed that both the Control Group, that is, Direct Instruction, and Self-Regulation (EG2), as well as Guided Discovery (EG3) were statistically better than Practical Instruction (EG1), thus more significantly enhancing Intrinsic Motivation.

DISCUSSION

Increase of intrinsic motivation after instructional intervention

Based on the results of the research, it appeared that Self-
Regulation (EG2) and Guided Discovery (EG3) were statistically better than Practical Instruction (EG1), resulting in further increasing Intrinsic Motivation. This finding is in line with the results of recent research in the field of Physical Education, which demonstrated that the method of Self-Regulation “activates” Intrinsic Motivation more than other teaching methods (Cuellar-Moreno, 2016).

These results are also in agreement with other previous studies, such as those of Mizios and Digellidis (2007) and Papaioannou and Orfanidou (2007), in which the method of Self-Regulation was used and positive effects of this Teaching were observed on the motivation and participation of children in the lesson. There have also been positive results in studies examining the effect of Inclusive Teaching on Intrinsic Motivation (Chatoupis and Emmanuel, 2003; Goudas et al., 1995; Papaioannou and Kouli, 1999), a method which also promotes students’ Self-Regulation processes (Byra, 2000).

In addition, the use of Self-Regulation has a positive effect on the participants’ Intrinsic Motivation and is in agreement with the results of a study that investigated the “activation” of the cognitive processes of students’ taught in this style (Papaioannou et al., 2012). The increased responsibility for making certain decisions in the learning process given to pupils while teaching by Self-Regulation seems to positively influence children’s sense of autonomy, which in turn has positive effects on their emotions, as opposed to students who were taught the same lesson by the method of Practical Instruction.

Generally, when students feel that the teaching environment does not diminish their self-esteem and perception of their abilities, they succeed in increasing their Intrinsic Motivation (Mitchell, 1996). These higher levels of autonomy and self-determination lead to higher endogenous motivation (Deci and Ryan, 1985) for students under the Self-Regulation method compared to students under Practical Instruction. In addition, if students' expectations of the outcome are high, then their intrinsic motivation tends to be high (Rodriguez-González et al., 2020).

**Suggestions**

The teaching methods, productive and reproductive, achieve the objectives of each lesson and thus the goals of Physical Education. Teaching methods add variety to the lesson, making it more interesting both for students, in shaping their social-emotional world, and for Physical Education teachers, by offering them alternatives and ways of teaching any skill more effectively.

Creating an educational environment that emphasizes learning and personal improvement is especially important because it does not only have a positive effect on motivating students, but also allows them to discover and develop personal methods that help them learn. The learning environment creates the necessary background for shaping students’ personal orientations and affects the approach towards the learning process.

Increasing the motivation of children is crucial, so choosing the right course content that gives all students equal opportunities and adopting a teaching method that promotes equality and creates the most enjoyable conditions possible for the students, should be one of the main goals of all teachers.

Finally, it would be extremely useful if future research efforts were to examine the effects that other aspects of the educational process may have, such as Perceived Competence (Harter, 1978) and Self-Efficacy (Bandura, 1986, 1997), not only in Physical Education but also in physical activities outside of school in the field of sport.

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