Increasing Motivation by Way of Alternative Training: Students and Lecturers Collaborate on a Dynamic Course on Developing Thinking

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Motivation is the level of effort expended by students in order to accomplish achievements in fields of learning they comprehend to be significant and worthwhile (Johnson & Johnson, 1985). It is therefore considered to be a crucial factor in learning. Studies have shown that motivation is divided into two types, namely, external motivation and internal motivation (Rand, 1992; Kaplan & Asor, 2001; Paulick, Retelsdorff, & Moller, 2013). The present research examined the increase in internal motivation among college students. Seventeen excellent classification female students from a college of education in northern Israel completed motivation questionnaires regarding their participation in a dynamic course, “Education for Thinking”. The questionnaires were administered at two points in time—at the beginning and end of the course. In addition, the students wrote reflection reports at the two measuring points. Quantitative and qualitative analyses revealed a significant rise in internal motivation at the end of the course relative to the beginning. The source of the rise could be traced to the students’ partnership spectrum in the teaching, full collaboration of the students in deciding on contents, and the use of alternative evaluation methods.

Keywords: motivation, developing thinking, dynamic course

Theoretical Background

Motivation

Motivation is a term that describes behavioral motives (Kaplan & Asor, 2001). The motivation to learn is defined as the level of effort expended by students in order to accomplish achievements in fields of learning they comprehend to be significant and worthwhile (Johnson & Johnson, 1985). In recent decades, there has been increasing recognition of the pivotal role of motivation processes in students’ success in their studies and in other adaptive processes such as emotions regarding learning and school, disruptive behavior in class, coping with difficulties or failure, and well-being in general (Kaplan & Asor, 2001).

Student learning is motivated by various factors and targets, internal versus external, and immediate versus future (Paulick et al., 2013). The theory of self-direction (Ryan & Deci, 2000) distinguish between types of motivation by reasons or goals that lead to action. The most basic distinction is between intrinsic motivation and extrinsic motivation.

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Internal motivation, in contrast, stems from the learner’s interest in and enjoyment of what he is learning (Kaplan & Asor, 2001; Rand, 1992), and is therefore considered to be a precondition for good learning (Harpaz, 2008). In other words, internal motivation is defined as behavior that is not motivated by a clear external reinforcement, but by sharp and fun activity and by perception the activity as an opportunity to be exposed, learn and fulfill their potential (Coon & Mitterer, 2010). Behavior is motivated by internal motivation performs professional than that motivated by external motivation (Joke, Dewitte, & Lens, 2004). Despite the clear evidence that humans are endowed by a high level of internal motivational tendencies, this tendency is reflected, apparently, only under specified conditions. Studies on internal motivation emphasized the same conditions that attract, maintain, and enhance this particular kind of motivation compared to conditions that eliminate or reduce it. Social and environmental factors, interpersonal events (such as rewards, communication and feedback) that contribute to a sense of Self efficacy during action can enhance the internal motivation to action, because they provide an answer to the basic Self efficacy (Tsui et al., 2013). Feelings of Self efficacy are not increase the internal motivation if they are not accompanied by a sense of autonomy or in the focus of inside perceived causality. In other words, not enough people have experienced what they consider Self efficacy; to maintain or enhance the internal motivation, they should also experience themselves as someone who direct their behavior, means that they should have autonomy and self-control (Ryan & Deci, 2000).

Tangible rewards undermine the existence of internal motivation. In addition, threats, dictates, competitiveness and external control are weakening it. Conversely, choice, self-guidance, and internal control are strong internal motivation because they provide a sense of autonomy. The importance of autonomy versus external control of the existence of internal motivation was clearly observed in studies of classroom learning. Teachers who supports autonomy are raised in their students more internal motivation, curiosity and desire to challenge. Students overly dominated, not only lose initiative, but also to learn as well, especially when learning a complex and requires conceptual and creative process (Ryan & Deci, 2000).

Although internal motivation is clearly an important type of motivation, the motivation of most narrow sense for activities that people engage in is not internally motivated, especially after that early childhood, is an external source of motivation. External motivation relates to behaviors intended to satisfy external demand or receive an external reward. People usually experience outside regulated behavior as control or alienated behavior, and take the focus of the causality of actions designated extraneous. For external motivation there are many forms such as the seal, which is considered a form of internal regulation which is still dominated and dictated rather, because people do these activities with a sense of pressure, in order to avoid guilt or anxiety or to promote ego or pride to be provided. Although behavior regulation comes from the one him-self, imprinted behavior is fully unexperienced as part of the self, and therefore still perceived as an external control focus. Another form of external motivation is the source of regulation of identification. Here one identifies with the personal importance of behavior and therefore gets its regulatory as part from himself.

Finally, the last form of external motivation is integrated regulation. Integration occurs when the regulation identifies fully embedded into the self. This happens through self-examination and congruence between new values regulators and other needs of the ego. The more one perceives the specific reasons for the action and incorporates them into the self, so the actions which he performs thru external motivation, are done by increasing of self-direction.

Integrated forms of motivation are similar in many aspects of internal motivation, but they are still external because even behavior conduct from integrative regulation is done with the perception of the
benefit—result of any distinct from the behavior itself (Pualick et al., 2013). Research findings expanded the types of external motivation, have shown a relationship between more external motivation and between increasing involvement, improved performance, less dropout rates and higher quality learning. As behaviors are based on external motivation are inherently interesting, the main reason people are expected to agree to perform these behaviors is due to the appreciation from the people that are important for them and they feel a connection to them. In the theory of self-direction above description called belonging. This means that school pupils willingness to accept the proposed values depend on their sentiment whether the teacher respect and care about them (Ryan & Deci, 2000).

The distinction between external and internal motivation is related to people’s behavior. When behaviors motivated by external factors such as reward, press, and grade, they behave or learn to get the reward or avoid punishment. However, when people are motivated by internal motivation, they feel free to follow their internal interest, and have free participation in activities (Ryan & Deci, 2000). In other words, participation in activities arises from free selection and willing. The difference between learners who are motivated internally and externally are that learners with internal motivation is more interested, personal security, excitement, perseverance, a good performance and show a better understanding of the task than those who are motivated by external motivation (Pualick et al., 2013).

It is customary to characterize motivation in the framework of what is called the quantitative view of motivation (Ames, 1990; Ames & Ames, 1984; Maher & Midgley, 1991), which decrees that there are three measures for motivational behavior: (1) direction—this refers to the choice an individual makes when he is the performer of a single activity and no other, when he perseveres with a particular activity even when difficulties arise or other alternatives present themselves, or when he continues with a particular activity even when he is not required to do so; (2) intensity—this is the level of effort the individual expends on the activity—high or low; and (3) quality—the quality of the activity also distinguishes among behaviors with a different motivational character—problem-solving by means of novel methods versus hard work employing an unsuccessful strategy; deep, critical thinking that provokes incisive questions versus a safe path toward the desired grade.

Lately, motivation researchers have begun to add to the quality measure an emphasis on the pupil’s psychological experience: his emotions with regard to the activities in which he is involved, his feelings toward learning and school in general, and his self-evaluation (Kaplan & Asor, 2001).

Bloom (1976) contended that there is a difference between individuals with respect to their emotional willingness to learn, as expressed in their interest, attitudes and view of themselves. When students approach learning tasks with enthusiasm and interest, their learning will be easier and, all other factors being equal, they will learn faster; their achievements will be greater than those of students who approach the task with a noticeable lack of enthusiasm and interest. The research demonstrates that the emotional characteristics and motivation are important for determining or influencing the pupil’s achievements (Lalonde & Gardner, 1993).

The motivation theories offer explanations for the processes that induce students to choose, persevere, and expend an effort in their studies as well as in social involvement and helping others; however, despite the fact that numerous theories from different fields (philosophy, psychology, neurobiology) have attempted to explain the phenomenon of motivation, no theory that embraces all the complex processes of which it is composed can be found. In addition, differences between definitions of the motivational terms make it difficult to transfer the understanding achieved in one theoretical framework to the advancement of the understanding of the motivational processes dealt with by another theory. Many researchers have expressed dissatisfaction with this
situation, in which motivation theories do not contribute to the development of a coherent body of knowledge (Kaplan & Asor, 2001).

One of the theories that attempted to clarify motivation is Maslow’s (1954) humanistic theory, which stresses the meaning of behavior for the individual and claims that the source of motivation resides in his innate needs. This theory gave rise to the Self-Determination Theory (Deci, Vallerand, Pelletier, & Ryan, 1991), which foregrounds the individual’s universal tendency to develop his hidden potential and realize his authentic self. This theory postulates that there are three basic innate needs that constitute the basis of an individual’s behavior:

1. The need for autonomy: This is the individual’s need to feel that his behavior is not imposed on him, but rather stems from him and expresses his authentic needs and tendencies;
2. The need for ability: This is the individual’s need to feel that he has the ability and the capacity to accomplish objectives that are difficult to accomplish;
3. The need for contact and belonging: This is the individual’s need to love other people and be loved by them, to be profoundly connected to those people, as well as the need to be a part of a bigger community.

In contrast, other theories, such as the one that deals with self-efficacy, or the theory of the aims of achievement (Bandura, 1977) emphasize socio-cognitive processes that focus on the individual’s subjective perceptions of himself and his surroundings, and that are constructed from the interaction with those around him. Self-efficacy is the individual’s perception of himself as successfully accomplishing the task facing him. Studies show that a high perception of self-efficacy in relation to some kind of task reinforces the tendency to select the task, persist in carrying it out even when difficulties are encountered, accomplish it well, and evaluate it as important and enjoyable.

The concept of the perception of self-efficacy constitutes one of the central pillars in the development of the theoretical approach to motivation that is called the “cognitive-social approach”. This approach is based on the assumption that the individual’s behavior is mediated by cognitive processes, and that these processes develop during social interaction. The basic assumptions of this approach state that the environment, the cognitive processes that occur in the individual and the individual’s behavior all exert an influence on one another (Bandura, 1986).

The teaching policy and the curriculum both influence the student’s motivation (Bloom, 1976). The student’s motivation level is a function of the degree of correlation between his “motivation type” and the customary teaching methods in his class. Thus, for instance, the use of the Internet, computer programs and group work were found to increase interest, enjoyment, and motivation among students studying science (Butler & Lumpe, 2008; Mistler-Jackson & Songer, 2000).

Evaluation in the school also exerts a significant motivational influence (Nisan, 1980). However, while the traditional examinations mainly affect external motivation (Rand, 1992), evaluation by means of portfolios leads to an increase in the students’ internal motivation (Kaplan & Asor, 2001; Mitchell, 1992; Rozner, 1998; Shulman, 1992). It seems, therefore, that above all, what is required in order to occasion the serious application of the body of motivational knowledge is a change in priorities: from an emphasis on achievement measured by comparative grades to in-depth learning that is motivated by quality motivation and by the student’s maximum emotional and social development (Kaplan & Asor, 2001) that must necessarily involve the students in processes of planning, execution, reflection and evaluation—in short, their involvement in decision-making regarding their studies.
Students’ Involvement in Decision-Making Regarding Their Studies

Teacher education programs constitute the key to developing positive learning environments (Rideout, 2006). It is desirable for such programs to assist in examining novice teachers’ attitudes and perceptions regarding education—among other things, how research findings can help them understand teaching—learning situations in the classroom, link them to personal experiences, and examine the various existing attitudes with reference to the learning environment in which they will work in the future (Khalil & Saar, 2009). Thus, collaboration between teachers and their students may well nurture a positive, constructive and motivational learning environment.

While Harpaz (2008) claimed that the first and most basic step in fostering learners’ thinking is to involve them in thinking about the topics studied, in reality, very little has been written about the involvement of students in the planning, execution and evaluation processes of courses. Research in this field is rare, with the exception of studies examining students’ involvement in the research, where it was proved that such involvement serves as a tool for increasing motivation and improving the school climate (Khalil & Saar, 2009).

Even in cases where the collaboration between teacher and students is not full, the study showed that a learning environment that grants the students autonomy in the choice of activities they wish to perform is likely to raise their level of motivation and cognitive involvement (Hanrahan, 1998). Henderson, Fisher, and Fraser (2000) also found that when the teacher demonstrates leadership in the classroom and accords the students responsibility and freedom of action, there is an increase in their academic achievements.

It would appear that the way to improve the students’ academic achievements is to change the existing learning environment and adapt it as much as possible to the environment as the students perceive it (Fraser, 1998; Fraser & Aldridge, 2002), namely, an environment that includes them, takes their wishes, interests and choices into account, and does not impose a sole “modus operandi” on them from above.

Thus, a positive learning environment emerges: the students’ participation in decision-making regarding their studies, autonomy in choosing the activities they wish to perform, responsibility and freedom of action, and involvement in course planning processes, in execution and in evaluation are all likely to constitute sources of motivational stimuli in the learning process. A new course at Sakhnin College on the topic, “Education for Thinking”, was planned in a manner that included dynamic processes that would make the students partners in its planning, learning, teaching and evaluation. It would also grant them autonomy in choice of contents and accord them responsibility and freedom of action while they scoured the literature for sources of knowledge relevant to the topics studied in the course.

Research Questions and Hypotheses

The main question underlying the present research relates to the influence of the course, “Education for Thinking”, on the participants’ level of motivation to learn. The research will examine their level of motivation both at the beginning of the course (henceforth, the “before” situation) and at the end of the course (henceforth, the “after” situation).

Research Question

Will differences be found (1) in the level of motivation of the students who participated in the course, “Education for Thinking”, and (2) between the level of motivation at the beginning of the course (namely, “before”) and the level of motivation at the end of the course (namely, “after”)?
Methodology

The study is an integrated paradigm (Mixed Method) the quantitative research (questionnaire given to students) and qualitative research (personal Diary). Using this paradigm stems from the fact that we need a quantitative approach to population anonymous, and a qualitative approach to strengthen the quantitative findings (Shkedi, 2003). The method combines a qualitative and quantitative research tools. This combination enables a highly credible research by using different research methods in the various study stages (Tashakkor & Teddie, 2003).

Research Subjects

Seventeen first- or second-year students from a college of education in northern Israel participated in the research. The students are studying in various tracks in the college: early childhood, special education, and middle school English.

In addition to their studies in the regular tracks, the students also study in the Excellence track, which offers these population unique courses. The students are accepted to this track on the basis of stringent acceptance requirements that included high grades in their matriculation and psychometric examinations.

Research Tools

The research employs a combination of tools for checking motivation. In order to validate the findings, a quantitative tool—namely, a closed quantitative questionnaire—was used, as was a qualitative tool—namely, reflection reports. The tools are described in detail below:

1. The first tool with which motivation was measured was a closed questionnaire administered before and after the course in the “before” and “after” situations. The questionnaire, which was based on the motivation questionnaire described in Khalil’s (2001) study, included 14 statements on a Likert scale of 1-5 levels (1—“Not true at all”, 2—“Not true”, 3—“I’m not sure”, 4—“True”, 5—“Very true”), so that 1 symbolizes low motivation and 5 symbolizes high motivation.

   The questionnaire was based on the following nine categories:
   (a) Homework;
   (b) Attendance;
   (c) Achievement orientation;
   (d) Listening to others in the lesson;
   (e) Expanding horizons and curiosity;
   (f) Interaction with the teacher;
   (g) Active participation;
   (h) Desire and “appetite” for devoting more time;
   (i) Enjoyment.

   Its validity and reliability were checked in Khalil’s (2001) study, which reported a reasonable Cronbach alpha value 0.79.

   Items 6 and 13 were negative expressions, so that a low response to them indicated high motivation, while a response with a high value indicated low motivation. Furthermore, in order to match the questionnaire fully to the needs of the course, “Education for Thinking”, some of the items were reprocessed, and, at the end of the processing of the questionnaire, were validated by two judges who were content experts in the field.
The second tool used to measure the level of motivation to learn consisted of reflection reports by means of which the students related to several course components. Two reports were written—one at the beginning “before” and one at the end of the course “after”. Qualitative analyses were performed in order to examine the level of motivation to learn that was expressed in the two sets of reports.

**Research Procedure**

The research was conducted at the college during the course, “Education for Thinking”, and comprised two stages. The first stage took place toward the beginning of the course. The subjects responded to the motivation questionnaire anonymously and repeated the procedure at the second stage, which occurred at the end of the course. The conditions under which the questionnaire was administered were identical for both stages. In addition, the students wrote reflection reports in which they related to emotions, fears and worries, assignments, methods and ways of teaching, evaluation and motivation. The reports were written both at the beginning and end of the course.

**Results**

The items on the questionnaire describe a range of situations in the educational climate—external stimuli (for instance, “I use the library to learn more about this topic”), and feelings—internal stimuli (for instance, “I don’t feel tired or bored during the lesson on this topic”). The first administration of the questionnaire in the “before” situation produced a Cronbach alpha reliability value of 0.69. A factor analysis of motivation grades revealed that only the first factor had conceptual meaning in according to the items that contained them. Seven of the 14 items on the questionnaire were found to be dominant (the loadings of the items in according to the factor was higher than 0.5). After the elimination of the other items, the Cronbach alpha value was 0.84. A factor analysis of the seven dominant items was performed, yielding two factors. The first factor, which included three items, reflected an external motivation stimulus. The three items (items 4, 10 and 14 respectively on the questionnaire) were: (1) “I learn a great deal from the discussions and from my peers’ questions and answers during the lesson”; (2) “In order to learn more about the topic, I use databanks, either computerized or non-computerized”; and (3) “I like the variety of teaching methods for this topic”. The second factor included four items (items 1, 6, 11 and 12 respectively on the questionnaire) and reflected an internal motivation stimulus, as follows: (1) “I do the homework and assignments for ‘Education for Thinking’ with a feeling of enjoyment and fun”; (2) “I don’t feel tired or bored during the lesson on this topic”; (3) “I have a growing interest and desire to continue studying the topic”; and (4) “I wish there were more lessons on this topic”.

The Cronbach alpha reliability value of the motivation grades at the end of the course was 0.55. A factor analysis of the motivation grades revealed that only the first factor had conceptual meaning in according to the items that contained them. Seven dominant items were found out of the 14 on the questionnaire. After the elimination of the other items, the Cronbach alpha value was 0.74. A factor analysis of the seven dominant items was performed, yielding two factors. The first factor, which included two items, reflected an external motivation stimulus. The two items (items 7 and 10 respectively on the questionnaire) were: (1) “I initiate conversations on the topic with the lecturers after the lesson”; and (2) “In order to learn more about the topic, I use databanks, either computerized or non-computerized”. The second factor included five items (items 3, 6, 9, 11 and 12 respectively on the questionnaire) and reflected an internal motivation stimulus, as follows: (1) “I
make an effort to improve my achievements in this topic”; (2) “I don’t feel tired or bored during the lesson on this topic”; (3) “I love participating in this lesson”; (4) “I have a growing interest and desire to continue studying the topic”; and (5) “I wish there were more lessons on this topic”.

It transpires, therefore, that not only is there a difference in the sources of motivational stimulus among the students between those identified at the beginning and those identified at the end of the course, but also that there are four common and dominant items (items 6, 10, 11, and 12 respectively on the questionnaire) at the beginning and end of the course, namely: (1) “I don’t feel tired or bored during the lesson on this topic”; (2) “In order to learn more about the topic, I use databanks, either computerized or non-computerized”; (3) “I have a growing interest and desire to continue studying the topic”; and (4) “I wish there were more lessons on this topic”. The Cronbach alpha reliability value for the grades of the common items was 0.66. The four items described an emotional and feeling-based dimension in that the students did not feel tired or bored during the lesson in the course, “Education for Thinking”. Moreover, they reported increasing interest and desire to continue studying the course topic, requested additional lessons, and devoted time and thought to actively researching the topic in computerized or non-computerized databanks. In other words, during the course, a motivational process that was nurtured by two sources of stimuli—the first external and the second internal—was generated. The two sources foreground the importance of an environment that involves the students, expresses their desires and choices, and does not impose a sole “modus operandi” on them.

In order to hone the differences in the students’ performances on the motivation examinations, we change the ranks of the scale from five to three; that is, we re-ranked the students’ answers so that answers 1 and 2 symbolized a low level of motivation, answer 3 symbolized a medium level of motivation, and finally answers 4 and 5 symbolized a high level of motivation.

In accordance with the dominant items on the motivation examination that were identified in the “before” situation, the findings show that the source of the main improvement in the percentage of students who reported a rise in the level of motivation resided in items indicating an internal motivation stimulus. Table 1 shows that there was a 30.2% increase in the percentage of students who reported an improvement in the level of motivation between the “before” and “after” situations as regards the “Education for Thinking” course. This increase in percentage is divided according to two sources: external and internal. While the increase in the percentage of students who reported a rise in the level of motivation as a result of external stimuli (items 4, 10 and 14) was 17.6% on average, the percentage of students who reported such a rise as a result of internal stimuli (items 1, 6, 11 and 12) was 39.7% on average. Furthermore, some 48.7% of the students reported a high and consistent level of motivation in both the “before” and “after” situations.

In order to examine the significance of the influence of the course, “Education for Thinking”, on the students’ level of motivation, we defined the extent and depth of the change in level of motivation in the following manner: Every student completed a questionnaire comprising 14 items (dimension and depth), and every item was marked by 17 students (dimension and extent). It transpired: therefore, that 238 two-dimensional reference points (depth and extent)—the product of the number of observations and the number of items—could be obtained. Since the number of dominant items in the “before” situation was seven, it turns out that the total number of dominant two-dimensional reference points is 119. Based on this, a two-dimensional summary is presented in Table 2.
Table 1

<table>
<thead>
<tr>
<th>Level of motivation “before”</th>
<th>Level of motivation “after”</th>
<th>Deterioration</th>
<th>No change</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item number</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>Total</td>
</tr>
<tr>
<td>1. I do the homework and assignments for “Education for Thinking” with a feeling of enjoyment and fun</td>
<td>11.8</td>
<td>0</td>
<td>0</td>
<td>64.7</td>
</tr>
<tr>
<td>4. I learn a great deal from the discussions and from my peers’ questions and answers during the lesson</td>
<td>23.5</td>
<td>0</td>
<td>0</td>
<td>35.3</td>
</tr>
<tr>
<td>6. I don’t feel tired or bored during the lesson on this topic</td>
<td>29.4</td>
<td>0</td>
<td>11.8</td>
<td>29.4</td>
</tr>
<tr>
<td>10. In order to learn more about the topic, I use databanks, either computerized or non-computerized</td>
<td>29.4</td>
<td>0</td>
<td>0</td>
<td>35.3</td>
</tr>
<tr>
<td>11. I have a growing interest and desire to continue studying the topic</td>
<td>17.6</td>
<td>0</td>
<td>11.8</td>
<td>11.8</td>
</tr>
<tr>
<td>12. I wish there were more lessons on this topic</td>
<td>11.8</td>
<td>0</td>
<td>0</td>
<td>70.6</td>
</tr>
<tr>
<td>14. I like the variety of teaching methods for this topic</td>
<td>17.6</td>
<td>0</td>
<td>3.4</td>
<td>48.7</td>
</tr>
<tr>
<td>General average</td>
<td>17.6</td>
<td>0.0</td>
<td>3.4</td>
<td>48.7</td>
</tr>
</tbody>
</table>

Table 2

<table>
<thead>
<tr>
<th>Level of motivation “before”</th>
<th>Level of motivation “after”</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item number</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>1. I do the homework and assignments for “Education for Thinking” with a feeling of enjoyment and fun</td>
<td>0.0</td>
<td>2.5</td>
<td>9.2</td>
<td>11.8</td>
<td></td>
</tr>
<tr>
<td>4. I learn a great deal from the discussions and from my peers’ questions and answers during the lesson</td>
<td>0.8</td>
<td>3.4</td>
<td>18.5</td>
<td>22.7</td>
<td></td>
</tr>
<tr>
<td>6. I don’t feel tired or bored during the lesson on this topic</td>
<td>3.4</td>
<td>13.4</td>
<td>48.7</td>
<td>65.5</td>
<td></td>
</tr>
<tr>
<td>10. In order to learn more about the topic, I use databanks, either computerized or non-computerized</td>
<td>4.2</td>
<td>19.3</td>
<td>76.5</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 shows that the percentage of students who reported an increase (from a low to a medium or high level (11.7%) and then from a medium to a high level (18.5%)) in the extent and depth of level of motivation was 30.2% as opposed to a decrease of 17.6% (from a high level to a medium or low level (16.8%) and then from a medium to a low level (0.8%)). The test of a hypotheses for equality of proportions (between increase and decrease proportions) exhibited a significant improvement in the extent and depth of the level of motivation ($P$-value = 0.011) at a significance level of 0.05.

In addition, the findings show that the main improvement in the percentage of students who reported an increase in the level of motivation to learn, when the level of motivation is analyzed in accordance with the dominant items of the “after” situation, is found particularly in the items that indicate an external motivational stimulus. Table 3 shows that there was a 32.8% increase among the students who reported an improvement in level of motivation between the “before” and the “after” situations, according to the dominant items of the “after” situation. While the increase in the percentage of students who reported an increase in the level of motivation to learn as a result of external stimuli (items 7 and 10) was 35.2% on average, the percentage of students who reported an increase in the level of motivation caused by internal stimuli (items 3, 6, 9, 11 and 12) was 31.8% on average. Furthermore, some 37.8% of the students reported a high and consistent level of motivation to learn both in the “before” and in the “after” situations.
Table 3

Change in the Percentage of Students According to the Change in the Level of Motivation to Learn Based on the Direction of the Change from “Before” to “After” (Dominant Items—“After”)

<table>
<thead>
<tr>
<th>Level of motivation “before”</th>
<th>Level of motivation “after”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item number</td>
<td>Deterioration</td>
</tr>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>3. I make an effort to improve my achievements in this topic</td>
<td>0</td>
</tr>
<tr>
<td>6. I don’t feel tired or bored during the lesson on this topic</td>
<td>23.5</td>
</tr>
<tr>
<td>7. I initiate conversations on the topic with the lecturers after the lesson</td>
<td>41.2</td>
</tr>
<tr>
<td>9. I love participating in this lesson</td>
<td>23.5</td>
</tr>
<tr>
<td>10. In order to learn more about the topic, I use databanks, either computerized or non-computerized</td>
<td>29.4</td>
</tr>
<tr>
<td>11. I have a growing interest and desire to continue studying the topic</td>
<td>29.4</td>
</tr>
<tr>
<td>12. I wish there were more lessons on this topic</td>
<td>17.6</td>
</tr>
<tr>
<td>General average</td>
<td>23.5</td>
</tr>
</tbody>
</table>

As previously, the influence of the course, “Education for Thinking”, on the extent and depth of the students’ level of motivation was examined using the same method. Thus, the total number of two-dimensional reference points in this case is 119.

Table 4

Change (in Extent and Depth) in the Percentages of Students According to the Change in Level of Motivation (Dominant Items—“After”)

<table>
<thead>
<tr>
<th>Level of motivation “before”</th>
<th>Level of motivation “after”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of motivation</td>
<td>Low</td>
</tr>
<tr>
<td>Low</td>
<td>0.8</td>
</tr>
<tr>
<td>Medium</td>
<td>0.8</td>
</tr>
<tr>
<td>High</td>
<td>6.7</td>
</tr>
<tr>
<td>Total</td>
<td>8.4</td>
</tr>
</tbody>
</table>

Table 4 shows that the percentage of students who reported an improvement (a transition from a low to a medium or high level (14.2%) and another transition from a medium to a high level (18.5%)) in the extent and depth of the level of motivation to learn was 32.8% as opposed to a deterioration of 23.5% (a transition from a high level to a medium or low level (22.7%) and another transition from a medium to a low level (0.8%)). The improvement in the extent and depth of the level of motivation in accordance with the students’ reports was found to be significant ($P$-value $= 0.056$) at a significance level of 0.06.

With reference to the shared dominant items (dominant in both “before” and “after” situations, namely, items 6, 10, 11 and 12), Table 5 shows that there was an increase of 41.2% among students who reported an improvement in the level of motivation to learn between the “before” situation and the “after” situation.
INCREASING MOTIVATION BY WAY OF ALTERNATIVE TRAINING

Table 5
Change in the Percentage of Students According to the Change in the Level of Motivation to Learn Based on the Direction of the Change from “Before” to “After” (Dominant Items—“Shared”)

<table>
<thead>
<tr>
<th>Level of motivation “before”</th>
<th>Deterioration</th>
<th>No change</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item number</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>6. I don’t feel tired or bored during the lesson on this topic</td>
<td>23.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10. In order to learn more about the topic, I use databanks, either computerized or non-computerized</td>
<td>29.4</td>
<td>0</td>
<td>11.8</td>
</tr>
<tr>
<td>11. I have a growing interest and desire to continue studying the topic</td>
<td>29.4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>12. I wish there were more lessons on this topic</td>
<td>17.6</td>
<td>0</td>
<td>11.8</td>
</tr>
<tr>
<td>General average</td>
<td>25.0</td>
<td>0.8</td>
<td>5.9</td>
</tr>
</tbody>
</table>

As previously, the influence of the course, “Education for Thinking”, on the extent and depth of the students’ level of motivation was examined using the same method. Thus, the total number of two-dimensional reference points in this case is 68.

Table 6
Change (in Extent and Depth) in the Percentages of Students According to the Change in Level of Motivation (Dominant Items—“Shared”)

<table>
<thead>
<tr>
<th>Level of motivation “before”</th>
<th>Level of motivation “after”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Low</td>
<td>0.0</td>
</tr>
<tr>
<td>Medium</td>
<td>0.0</td>
</tr>
<tr>
<td>High</td>
<td>7.4</td>
</tr>
<tr>
<td>Total</td>
<td>7.4</td>
</tr>
</tbody>
</table>

Table 6 shows that the percentage of students who reported an improvement (a transition from a low level to a medium or high level (16.2%) and a transition from a medium level to a high level (25.0%)) in the extent and depth of the level of motivation to learn was 41.2% as opposed to a deterioration of 25.0% (a transition from a high level to a medium or low level (25.0%) and another transition from a medium to a low level (0.0%). The improvement in the extent and depth of the level of motivation was found to be significant ($P$-value = 0.023) at a significance level of 0.05.

Cluster Identification
In order to check the common type of subjects’ reactions both at the beginning and at the end of the course, a cluster analysis was performed on the questionnaires. According to this analytical method, the diversity within the clusters is reduced to the minimum and the diversity between them is increased to the maximum. This method is based on a predetermined number of clusters. In order to determine the clusters, two statistical methods were employed:

**K-means cluster analysis.** This method enables clusters of homogeneous items to be identified in relation to their characteristics—in our case, in relation to the 14 items. The algorithm in this method calculates the average square of the simple Euclidean distance between the items in order to determine the order of the members of the different clusters.
Hierarchical cluster analysis. In contrast to the first method, the algorithm in this method calculates the distance between two clusters according to Ward’s distance. This method is more solid than the first.

In both methods, identical clusters were found. Moreover, in accordance with the profiles of the clusters according to both methods (a) and (b), dominant profiles among the subjects can be characterized relatively easily.

It was found that the common profile of the students according to the questionnaire that was administered at the beginning of the course, and the students gave a high ranking to the items with high significant according to there opinions, was expressed by the following items: “I try not to be late for this lesson or miss it”; “I make an effort to improve my achievements in this topic”; “I like the lecturers’ method of teaching the topic”; “I learn a great deal from the discussions and from my peers’ questions and answers during the lesson”; “I like the variety of teaching methods for this topic”; “I use the library to learn more about this topic”; “In order to learn more about the topic, I use databanks, either computerized or non-computerized”; and “I have a growing interest and desire to continue studying the topic”. The students gave the rest of the items a low ranking: “I don’t feel tired or bored during the lesson on this topic”; “I wish there were more lessons on this topic”; and “I don’t devote enough time to the demands of the topic”. This common profile, which characterizes 53.0% of the general profiles, supports the explanations and validates the reliability analysis of the Cronbach alpha measure.

In other words, the students complained about the fact that the course was being held during the summer vacation since most of them had planned to work in order to finance their studies. In addition, they were bothered by the intensity of the course because it encroached on the amount of time available to them, and also, perhaps, by the issue of achievement orientation, which was important to them since they came from the Excellence track.

The common profile of the students according to the questionnaire that was administered at the end of the course, and the students gave a high ranking to the items with high significant according to there opinions, was expressed by the following items: “I do the homework and assignments with a feeling of enjoyment and fun”; “I learn a great deal from the discussions and from my peers’ questions and answers during the lesson”; “I like the lecturers’ method of teaching the topic”; “I like the variety of teaching methods for this topic”; “I try not to be late for this lesson or miss it”; “I make an effort to improve my achievements in this topic”; “I use the library to learn more about this topic”; and “I have a growing interest and desire to continue studying the topic”. The students gave the rest of the items a low ranking: “I feel tired or bored during the lesson on this topic”; and “I don’t devote enough time to the demands of the topic”.

Thus, even in the cluster analysis, it was found that the properties of the dominant profile corresponded with and supported the findings of the previous analyses, showing that the high motivation stemmed from both external and internal sources.

An analysis of the students’ level of motivation according to the qualitative research tool was also performed. The qualitative tool for checking it consisted of reflection reports that the students were requested to write at the beginning and end of the course. These reports were analyzed in accordance with the nine categories relevant to motivation, as expressed in Khalil’s (2001) research, and in accordance with the questionnaire for checking motivation that was distributed to the students before and after the course. The categories are as follows: homework, attendance, achievement orientation, listening to others in the lesson, expanding horizons, interaction with the teacher, active participation, desire and “appetite” for devoting more time, and enjoyment.
From the analyses of the reports written at the beginning of the course, it transpires that most of the students related to the categories expressing attendance, achievement orientation, desire and appetite, enjoyment, interaction with the teacher, curiosity, and active participation. This was reflected in the manner in which their anxieties and uncertainty were dispelled in the first lesson thanks to the preliminary explanation of the course procedure, which the lecturer described clearly and comprehensibly—something that appealed to them. They were given the impression that the course would be taught in a new and unconventional format. Moreover, the students related to the unsuitable scheduling of the course and to their fears of low achievements—particularly in the light of their membership of the Excellence track.

From the analysis of the reports written at the end of the course, it transpires that most of the students related to the categories expressing listening to others in the lesson, active participation, interaction with the teacher, the desire to expand horizons, curiosity, enjoyment, and the desire and appetite for devoting more time. They lauded the open discussions and the many questions that arose during their studies, the lecturers’ unique teaching method, and particularly the variety of teaching methods employed during the course. Furthermore, they stressed the claim that the success of the course was inextricably linked to the lecturer's skills and qualifications, which were prerequisites for success.

The issue of the course syllabus as prepared by the students was mentioned frequently as a new and interesting method, and this compelled them to make every effort to find materials accordingly. In addition, while most of them expressed their desire to continue studying the topic of education for thinking, they complained that too little time had been allotted to the course, and claimed that a request to schedule more time was justified. Moreover, they expressed interest in the lesson procedure and did not feel fatigued.

While the reflection reports from the initial stage of the course expressed curiosity about the course on the one hand and the anxieties relating to the future contents of the course on the other, the reports from the end of the course contained insights and references to the learning and teaching process in it.

It is important to mention that there was a fitness between the findings of the reflection reports and the analyses of the motivation questionnaires, and this led to an improvement in the percentage of students who gave the following statements a high ranking at the end of the course: “I don’t feel tired or bored during the lesson on this topic”; “I love participating in this lesson; In order to learn more about the topic, I use databanks, either computerized or non-computerized”; “I have a growing interest and desire to continue studying the topic”; and “I wish there were more lessons on this topic”. Similarly, in their reflection reports, the students related to the same contents of the dominant statements as in the motivation questionnaire.

**Discussion**

The planning of the studies in the courses taught at colleges of education is not always in line with the students’ needs, inclinations and academic and affective interest (Lazarowitz, 2000). The present study focused on a new college course on education for thinking—a course that included dynamic processes involved in planning, learning, teaching and evaluation. The research aim was to examine the effect of these dynamic processes from focal points of formative evaluation on the students’ level of motivation.

In order to investigate the effect of this unique course on the participants’ level of motivation, the students were examined at two points in time: at the beginning and end of the course. At both times, the students completed motivation questionnaires and wrote reflection reports.

Students’ motivation to learn is of crucial importance in their learning process. Motivation is so important
that it can be compared to a generator—a power producer, to a starter—an action initiator, and to a steering wheel—a motion director. Lam (1999) maintained the crucial factor in learning to be neither the intellect nor the didactic method, even though both of them play a part in it, but rather motivation. The results obtained from this research indicate a clear increase in the participants’ level of motivation in the course, “Education for Thinking”. This finding emerges from the two research tools: the motivation questionnaires and the reflection reports.

The analysis of the findings demonstrates that a rise in the level of motivation occurred, resulting in higher grades on the motivation questionnaires (extent and depth) administered at the end of the course than on those administered at the beginning of it. A similar trend is revealed by the analyses of the students’ reflection reports. These analyses show that at the end of the course, the participants’ level of motivation was higher than it had been at the beginning.

Discussion of the Findings from the Motivation Questionnaires

The discussion will relate to motivation in general with two measurements performed at different points in time in such a way that the first measurement extended from the beginning to the end of the course with the point of reference being the beginning of the course. The second measurement was performed at the end of the course.

The findings show that motivation can be divided into two types: internal motivation and external motivation, both at the beginning and at the end of the course. Internal motivation is manifested in inner responsibility, feelings, desires, emotions and the evaluation of abilities. External motivation is reflected in the relationship with the teachers, teaching methods, use of teaching aids, varied contents, characteristics of the students in the class, course length, scheduling of the course—in other words, the educational climate and environment. Distinction between the sources of motivation discussed extensively in the literature (Paulck et al., 2013).

An improvement in the general (internal and external) motivation grades was observed toward the end of the course. The rise in general motivation stems principally from the rise in the internal motivation that was observed toward the end of the course. This rise was reflected in doing homework and assignments with a feeling of enjoyment, the inclination to engage in in-depth learning, and the increased desire to participate in more lessons. These data are found to correspond with Bloom’s (1976) claim that learning accompanied by enthusiasm and interest is more challenging than learning without enthusiasm (Joke, Dewitte, & Lens, 2004). Similarly, Kaplan and Asor (2001) claimed that the learner’s positive emotions and feelings regarding school as well as his self-evaluation contribute to the dimension of quality in motivational behavior (Ames & Ames, 1984; Ames, 1990; Maher & Midgley, 1991; Coon & Mitterer, 2010).

The measurement performed at the second point in time, namely, at the end of the course, revealed a significant improvement in the general (internal and external) motivation grades. The rise in general motivation stems mainly from the rise in external motivation, which was measured at the end of the course. This rise is attributable to the supportive atmosphere, the initiation of conversations on the topic with the lecturers (Pualick et al., 2013), the judicious use of computerized and non-computerized databanks, full partnership in decision-making, and participation in deciding on contents, evaluation and assignments. These findings correspond with those of Kaplan and Asor (2001), who claimed that in-depth learning that is motivated by quality motivation and by the student’s maximum emotional and social development must necessarily involve
the students in processes of planning, execution, reflection and evaluation—in short, their involvement in decision-making regarding their studies. Also, teachers support autonomy raise their students autonomy more internal motivation, curiosity and desire to challenge (Ryan & Deci, 2000).

In the light of this, the two types of motivation, internal and external, support an environment that includes the students, expresses their desires and choices, and does not impose a predetermined “modus operandi”, set of contents and/or teaching method on them. Thus, when there is collaboration between teacher and students, with the teacher demonstrating leadership in the classroom and giving the students responsibility and freedom of action, and the design of the learning environment grants the students autonomy in their choice of assignments, their motivation and cognitive involvement are likely to increase (Hanrahan, 1998) and their achievements may well improve (Henderson et al., 2000). Moreover, as behaviors are based on external motivation are inherently interesting, the main reason people are expected to agree to perform these behaviors is due to the appreciation from the people that are important for them and they feel a connection to them. In the theory of self-direction above description called belonging. This means that school pupils willingness to accept the proposed values depend on their sentiment whether the teacher respect and care about them (Ryan & Deci, 2000).

The findings from the profile analysis show that at the beginning of the course, most of the students reported that they were trying not to be late or to miss lessons, and were making every effort to do well. However, the students complained about the fact that the course was being held during the summer vacation. In addition, the intensity of the course bothered them and encroached on the amount of time available to them. The findings from the profile analysis at the end of the course show that most of the students reported that they did their homework and assignments with a feeling of enjoyment and fun, learned a great deal from the discussions and from their peers’ questions and answers during the lesson, and liked the variety of teaching methods employed by the lecturers as well as the latter’s expertise.

Discussion of the Analysis of the Reflection Reports

As in the motivation questionnaires, the analysis of the reflection reports formulated by the students at the beginning and end of the course revealed a noticeable rise in the level of motivation. This rise can be explained by means of three factors that are associated with the contents and characteristics of the course, “Education for Thinking”.

(a) The variety of teaching methods employed in the course, “Education for Thinking”: The students were exposed to diverse teaching methods. In contrast to many other courses in which frontal teaching was the norm, the students in the above-mentioned course participated in discussions, worked in groups, and used the library to explore questions and problems concerning a broad range of issues in the course. They took part in tasks that were diverse from the point of view of the activities they were required to perform in each and every task, and in most cases were active, assumed a central role in the learning activity, and were responsible for comprehending the material and for their progress in the learning stages. The feeling that accompanied the students, as can be learned from their reflection reports, was one of enjoyment and desire to continue activities like those both in the future and in the rest of their courses; they described this as “whetting their appetites”. Among the ways of teaching they particularly lauded were the group and plenary discussions and the group work on the various tasks.

The findings of the present study corresponded with those of Mistler-Jackson and Songer (2000), who found variety in ways of teaching/learning, such as the use of the Internet and group work, to be instrumental in increasing interest, enjoyment and motivation among science students.
(b) Full collaboration of the students in determining the course contents: The students in the course, “Education for Thinking”, were partners in the decision-making regarding the course components. Course contents, evaluation methods, assignments and even the syllabus were determined in conjunction with the students. The lecturers directed the students autonomously to the databanks in order to develop their feelings of autonomy. The aim was not only to seek learning materials but also to decide upon their inclusion in the syllabus after the discussion with the rest of the group. In addition to the enjoyment and the desire to devote more time to the assignments, the students reported expanded horizons and a feeling of autonomy and full collaboration in deciding upon contents, assignments and evaluation methods. The students’ reports correspond with the findings of Khalil and Saar (2009), who found that collaboration between teachers and students is likely to foster a positive, constructive and motivational learning environment.

Even in cases where the collaboration between teachers and students was not full, the research showed that a learning environment that grants the students autonomy in the choice of activities they wish to perform is likely to increase their motivation and cognitive involvement (Hanrahan, 1998). Henderson et al. (2000) also found that when the teacher demonstrates leadership in the classroom and accords the pupils responsibility and freedom of action, their academic achievements improve. Autonomy in the choice of learning environment is likely to improve the students’ academic achievements (Fraser, 1998; Ryan & Deci, 2000; Fraser & Aldridge, 2002). This refers to an environment that includes them, takes their wishes, interests and choices into account, and does not impose a sole “modus operandi” on them from above.

(c) The use of alternative evaluation methods: Portfolios and reflection reports. The course participants, together with the lecturers, built portfolios that contained the assignments, the course products, and written reflection sheets to accompany those products. Evaluation by means of the portfolio permitted the students to be involved in and responsible for their learning, including their participation in setting criteria for evaluating their work and providing opportunities for self- and peer evaluation. In addition, the students’ prerogative to rewrite their papers or to submit the portfolios for the teacher’s evaluation more than once decreased the threat felt by the students vis-à-vis the traditional evaluation methods, since they understood that they could improve their work at any time—and consequently, also their achievements.

Nisan (1980) pointed out that evaluation in school has a broad motivational effect. Rozner (1998) evaluated the change in the matriculation examination format in the framework of Project 22 (an experimental project initiated by the Ministry of Education as a result of the recommendations of the Ben-Peretz Committee). Twenty-two schools throughout the country participated in the project for three years, starting from 1994/1995. Those schools were granted special permission to evaluate their students in several subjects, using ongoing school evaluation—alternative evaluation—equivalent to the matriculation exams. Rozner examined the effect of the alternative evaluation methods (mainly the portfolio) on teaching/learning processes. He found that the use of alternative evaluation by means of portfolios resulted in a significant improvement in the students’ motivation, in the learning climate and in the students’ involvement and responsibility, similar to the findings that emerged in the present study. Thus, evaluating the examinees’ performance by means of portfolios that can be improved after checking, those increase the examinees’ motivation and improves their achievements.

Both Rozner’s (1998) and our findings regarding the increase in students’ motivation and responsibility for learning as a result of evaluation by means of portfolios correspond with the objectives of alternative evaluation, according to Birnbaum (1997), and are supported by Shulman (1992), who, in his article “Democracy and Pedagogy”, described a school in the U.S. in which evaluation is based on portfolios. Shulman
reported that an atmosphere of a learning community, enthusiasm and self-realization prevailed in the school. According to him, the quality and standard of the portfolios were high.

Mitchell (1992) also mentioned the rise in students’ motivation as one advantage of portfolios, and enumerated several more: the ability of the portfolio to serve simultaneously as a study tool and as a medium for evaluation; its ability to demonstrate progress in accomplishing preset goals; its ability to involve the parents, thereby increasing the student’s motivation. Moreover, the method contributes to an improvement in the teachers’ professionalism and encourages creativity. Evaluation by means of portfolios is attractive to those involved in learning processes and does not constitute a threat to either the students or their teachers, as Silberstein (1998) explained: “Reflective learning accepts the constructivist standpoint as explaining the nature of the learning process and assumes a type of learner with self-direction, who demonstrates a capacity for selecting learning goals, ways of learning, self-criticism, evaluation and internal motivation”. Rand (1992) differentiated between internal motivation, which stems from the learner’s interest and from what he is learning, and external motivation, which is nourished by external rewards. He claimed that traditional examinations exert an influence primarily on external motivation; in contrast, alternative evaluation increases internal motivation (Kaplan & Asor, 2001; Mitchell, 1992; Rozner, 1998; Shulman, 1992).

References


