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Exploring Students' Perceptions about Learning in School: An Activity Theory Based Study

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Abstract

In the current study, we used Activity Theory as the conceptual framework for exploring students' perceptions about how learning in school is affected by the following five elements: Object, Tools, Rules, Community and Division of Labor. Data were collected by administrating a semi-structured questionnaire among 70 junior high school students and interviewing a sample of 25 participants. The findings showed that the students positively evaluated the Object and Division of Labor categories, but appreciated less the contribution of Tools, Rules and Community to learning. This indicts that current schooling offers only little a constructivist-learning environment in which students interact with Tools, Rules and Community, and take an active part in forming the learning environment, as derived from Activity Theory.

Keywords: activity theory, students' perceptions, learning in school

1. Introduction

Educators have always been interested in understanding the factors that affect students' learning and the school's success in imparting to the students the knowledge and skills essential for their integration into society and the economy. Today, educators are widely recognizing that learning is not about knowledge delivery, but about a cognitive process of knowledge construction strongly affected by social, cultural and emotional factors. From this view of learning, we are increasingly expecting that the school would adapt more constructivist, student-centered instructional methods, such as problem-based learning and project-based learning in which students work in teams to investigate or solve real-life questions and problems (Savery, 2006; Hmelo-Silver**,** 2004; Blumenfeld et al., 1991). Educators are also expected to increase the use of modern information and communication technologies (ICT) to create a constructivist-learning environment in school. On the other hand, our educational system is still dominated by the "factory model" of schooling, and teachers are frequently required to teach standard curriculum using traditional instruction methods. In light of the conflicts accompanying schools today, the current study sought to explore the factors affecting learning in school from students' viewpoints. As Shuell (2011) writes, "it is the students' perceptions, prior knowledge, and beliefs that determine what and if they learn something approximating the instructional goals of the teacher. The bottom in the teaching-learning process is the learning activities in which the students engage, not the instructional activities in which the teacher engages." The activity theory presented in the following section was selected as the conceptual framework for this research because this theory examines teaching and learning in school as an activity system and provides a conceptual lens through which we can investigate the interaction between a range of social and cultural factors comprising this system in order to understand the quality of schooling (Dakers, 2011).

2. Literature Review

2.1 Activity Theory and Learning in School

Activity theory is a psychological meta-theory, paradigm or framework about studying, thoughts and consciousness. The origins of activity theory lay in Vygotsky's (1978) cultural-historical psychology that sought to understand human activities as complex, socially situated phenomena. Vygotsky was a leader in the formation of a theoretical approach emphasizing the contributions of the social and cultural world to intellectual development. His work was grounded on 18th and 19th century classical German philosophy, including Hegel's

idealism and Marx and Engels historical materialism. Vygotsky aimed at establishing psychology as a scientific discipline, in contrast to the paradigms of stimulus-response and the behaviorism learning theory that dominated the psychological literature in the early 20th century.

Engeström (1999) outlined three generations of activity theory. The first generation of activity theory had to do with the work of Vygotsky, who emphasized that human higher mental functions are products of mediated activity. Mediational tools are artificial formulations that help the flow and structure of mental functions, just as technical means are used to control processes of nature. There are two kinds of mediational means: psychological tools or signs, such as language, counting systems, mnemonic devices, algebraic symbols and writing that facilitate and direct thinking processes, and material tools and artifacts that support learning and cognition, for example, pencil and paper, textbook or a computer. The notion that mediating tools affect how people think and interact with the environment and with other people is very central to Vygotsky's socio-cultural theory and activity theory as well. Culture, both through its members and via the artifacts in which it is represented, provides mediational means that enable the development of higher-level cognitive skills such as complex memory processes and problem solving (Benson and Haith, 2009).

In the basic form of activity theory formulized by Leont'ev (1978), the unit of analysis is a motivated activity directed at an object, as opposed to cognitive psychology, which focuses on the study of the individual as a separate unity. The famous basic 'activity triangle' (see Figure 1) consists of the following elements:

- Subject – The individual or subgroup involved in the activity.
- Object – The problem space or recipient of action to which the activity is directed to be molded or transformed in reaching the outcome that is sought.
- Tools – Internal mental signs and external physical objects that facilitate and support thinking processes and regulate interaction between the individual and the world.

The second generation of activity theory broadened the focus of discussion from individual action to collective action, namely the social context in which an activity takes place. Largely influenced by Leont'ev's work (1978), Engeström (1999) formulized the 'activity system' model illustrated in Figure 1.

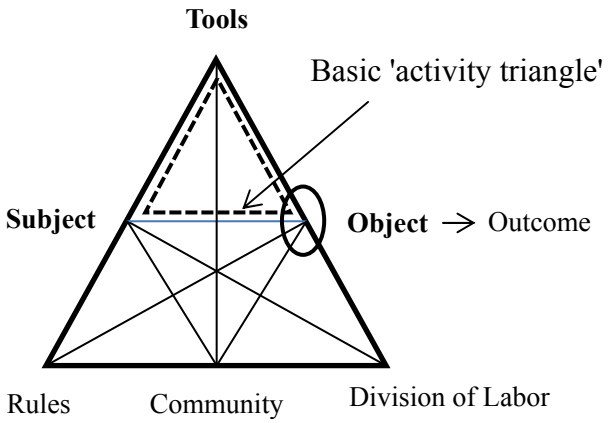

Figure 1. Activity system model

In addition to the basic components of Subject, Tools and Object presented in the basic 'activity triangle, 'the activity system model also includes the following three elements:

- Rules–norms, regulations, convention and guidelines that afford or constrain action and interaction within an activity system.
- Community –multiple individuals and subgroups involved in an activity.
- Division of Labor –distribution of work and responsibilities between members of the community.

The diagram depicted in Figure 1 illustrates that the Object of the activity is mediated not only by Tools (artifacts) but also by the Rules, Community and Division of Labor in which the activity takes place. Engeström (1987) introduced the notion of "Learning by expanding," according to which learning has to do with knowledge

production rather than reproduction through continuous interaction with components of an activity system. Individuals not only use instruments, obey rules or participate in a community, they also continuously renew, develop and reformulate them.

A key characteristic of the activity system is the contradictions or conflicts occurring within or between elements in a system (Engeström, 1987). In the school context, for example, teachers might face contradictions between their obligation to 'complete' the teaching of a given syllabus or prepare students for standard tests (Rules), and their wish to increase the use of information and computer technologies (Tools) to enrich learning or foster creative thinking among the students (Object). Contradictions might cause disturbances or problems in a system on the one hand, but may also serve as a driving force for innovative attempts to change the activity on the other. As Cole and Engeström (1993) explained, in activity systems "equilibrium is an exception and tensions, disturbances, and local innovations are the rule and the engine of change" (p. 8). Jaworski and Potari (2009) used the activity system model for analyzing episodes of teaching mathematics in a Grade 10 class in a UK secondary school from teachers' and students' perspectives. For example, *Object* for teachers is 'understanding basic statistical terms and associated concepts'; for students, it is 'classroom survival.' *Rules* for teachers are 'curriculum and examination requirements'; for students, it is 'homework expectations within the school.' These authors also show examples of *tension* between tools, community, rules and division of labor.

Following the first and second generations of activity theory, we have recently witnessed the development of the third generation, which involves simultaneously examining a number of activity systems that individuals are engaging in while sharing a common object, as illustrated in Figure 2. The third generation of activity theory, as proposed by Engeström (1999), deals with "developing conceptual tools to understand dialogue, multiple perspectives and voices, and networks of interacting activity systems" (p. 4).

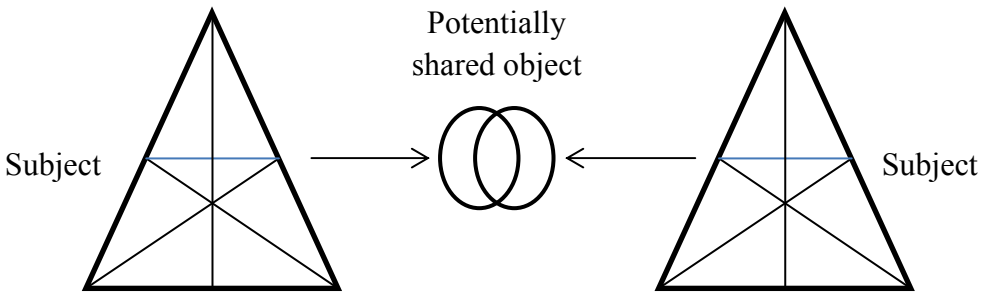

Figure 2. Activity theory – the third generation

The interaction between several systems working simultaneously might cause contradictions within or between the elements of an activity system, as well as between different activity systems focused on a partially shared object. Bakhurst (2009) writes that the third generation of activity theory examines the relations between activity systems and addresses issues of representation, voice, emotion, identity and difference, which can and should be incorporated into the activity theoretical approach, although it was neglected by the founders of activity theory. Later in this paper, we will show how this view of activity theory helps in understanding students' viewpoints about learning in school addressed in this study.

2.2 Activity Theory and Social Constructivism

Jonassen and Rohrer-Murphy (1999) assert that activity theory provides an appropriate framework for analyzing needs, tasks and outcomes for designing a constructivist-learning environment (CLE), since the assumptions of activity theory are very consonant with those of social constructivism, strongly influenced by Vygotsky's (1978) work, and situated learning (Brown, Collins and Duguid, 1989; Lave and Wenger, 1991), and everyday cognition that underlie CLEs. Jonassen and Rohrer-Murphy (1999) stress that conscious learning emerges from activity (performance) and is not a precursor to it. Therefore, CLEs should attempt to replicate the activity's structures, tools and sign systems, socio-cultural rules and community expectations that performers must accommodate while acting on some object of learning. Salomom (1993: xv) regards activity theory as a strong, or even radical, version of distributed cognition, which argues that the 'proper unit of psychological analysis should be *joint* (often, but not necessarily) *socially mediated activity* in a cultural context (see, for example, Cole and Engeström 1993; Pea 1993). Postholm (2008) draws parallel lines between cultural historical activity theory and Dewey's

idea-based social constructivism. For example, in both theories, learning is considered a process of growth and development; mediating artifacts, and language in particular, play a key role in learning; and higher mental functions are looked upon as having a social and cultural origin.

2.3 Summary and Research Objectives

Since the early 1950s, students' perceptions were an important issue in research. Studies were carried out relating to the intelligence, interests, aptitudes, students' personality characteristics and achievements in school (Malpass, 1953; Bachman and O'Malley, 1986; Brand et al., 2003; Way, Reddy & Rhodes, 2007). Students' perceptions about school climate were examined from several perspectives, for example: the nature of relationships between teachers and students; the nature of relationships between students; the extent to which student autonomy is allowed in the decision-making process; and the extent to which the school provides clear, consistent and fair rules and regulations. Researchers have noted that if a "person-environment fit" is lacking or students do not perceive school as supporting their need for relatedness, autonomy and consistency, their psychological and behavioral health will be at risk (Connell and Wellborn, 1991; Eccles et al., 1993). However, despite growing interest in students' perceptions over the years and evidence of the influence of such perceptions on psychological and behavioral adjustment, relatively few studies have been conducted on this subject (Way, Reddy & Rhodes, 2007). In examining all the necessary components that involve students in the education system, we lack a specific framework that gathers all of the components "under one roof". The model of activity theory discussed above may meet this need. Jonassen and Rohrer-Murphy (1999) explain that activity theory provides a lens for analyzing learning processes and outcomes that can help in designing instruction. According to these authors, rather than focusing on knowledge states, activity theory "focuses on the activities in which people are engaged, the nature of the tools they use in those activities, the social and contextual relationships among the collaborators in those activities, the goals and intentions of those activities, and the objectsor outcomes of those activities"(p. 68).

Activity theory has been discussed increasingly as a conceptual framework for educational studies, for example, within the context of teaching mathematics (Venkat and Adler, 2008; Jaworski and Potari, 2009), science education (Van Aalsvoort, 2004; Lazarou, 2011), technology education (Stevenson, 2004; Dakers, 2011), introducing educational technology into the classroom (Benson, Lawler and Whitworth, 2008; Murphy and Rodriguez-Manzanares, 2008; Issrof and Scanlon, 2002), and the study of human-computer interaction (Kaptelinin, 1996). Lazarou (2011), for example, examined ways in which the cultural-historical activity theory could be used for the design, development and evaluation of a computer game for primary science education. Activity theory has also been used for studies in post-school education, for instance, teaching the development of doctoral students (Hopwood and Stocks, 2008), and learning at work (Engeström, 2001).

The research addressed in this paper adds a different outlook to the literature on activity theory, as it considers this theory as a framework for exploring students' overall perceptions about learning in school, rather than teaching a particular subject matter or investigating a specific instructional method.

Consequently, the study addressed in this paper was guided by the following questions:

1) What are the perceptions of junior high school students about the five major activity system aspects –Object, Tools, Division of Labor, Community and Rules – in the context of learning in school?

2) How do students' perceptions about these aspects inter-correlate or contradict?

3) Are there other activity systems that might support or contradict learning in school?

3. Method

3.1 Setting

The participants in this study were 70 students from four junior high schools in the southern region of Israel. It is useful to add some information here about the Israeli educational system. The students start school at age six. They learn six years in primary school, three years in junior high schools and three years in high school. Over 90% of Israeli children complete 12 years of schooling, at age 18. The students study 35-40 hours a week in school. The compulsory curriculum encompasses subjects such as mathematics, science, Hebrew, English and history. The vast majority of the teachers are college or university graduates who specialize in teaching specific subjects. Most of the schools have a science lab and computer labs, and great efforts are being made to introduce information and computer technologies into teaching and learning. However, the traditional teaching method still dominates our schools and the students often spend only a relatively small portion of school hours for learning in science or computer labs.

For this research, we chose schools that are typical to our educational system. Each of them serves children from families characterized by a wide spectrum of socio-economical background. In each school, we randomly chose a group of 15-20 students (9^{th} grade, age 14-15), all from classes learning upper level courses in mathematics, science and English (although not gifted students).

We selected a medium-sized junior high school in Israeli terms (150 students at each grade level) to avoid bias in the findings because of factors relating to school size such as quality of the curriculum or teachers' attitudes (Bowen, Bowen and Richman, 2000). Weiss, Carolan and Baker-Smith (2010) investigated the relations among school engagement, mathematics achievements and school size with specific focus on cohort size. They found that that moderately sized cohorts or grade level groups provide the greatest engagement advantage for all students, and that potentially harmful changes exist when cohorts grow to beyond 400 students.

We chose to conduct the research among 9^{th}-grade students because this is their third and last year of learning in junior high school. The students could reflect on their learning in junior high school before enrolling into secondary school, in which the students take the matriculations exams that often demand intensive learning efforts.

3.2 Methodology

The study adopted a mixed method, combining quantitative and qualitative methods, aimed at bringing to light as many aspects as possible of students' perceptions about learning in school. According to Creswell and Plano Clark (2007), the combined use of quantitative and qualitative approaches provides a better understanding of research problems than either approach alone. Greene (2005) pointed out that "a mixed method of thinking seeks better, more comprehensive understanding of educational phenomena, understanding that is woven from strands of particularity and generality, contextual complexity and patterned regularity, inside and outside perspectives, the whole and its constituent parts, change and stability, equity and excellence" (p. 208). The quantitative tool we used was a closed-ended questionnaire. As Kember and Leung (2008) write, a substantial part of social science research makes use of questionnaires to gather data or seek opinions from stakeholders on a wide range of issues. The qualitative tools were open-ended questions in the questionnaire and interviews. More specifically, data collection included:

The close-ended Likert-type questionnaire

The questionnaire distributed to the students consisting of 26 Likert-type items. The questions related to the five categories of the activity system model (see Figure 1): Object (4 items), Tools (4 items), Community (6 items), Division of Labor (4 items) and Rules (8 items). The latter category included more items than the other categories because we wanted to ask the students specifically about rules concerned with issues such as school attendance, homework and exams.

In order to ensure the validity of the questionnaire, we used an experts panel comprised of two academic researchers (PhD) in science and technology education and two MA students in education who are also school teachers. The questionnaire was revised in several rounds according to the panelists' comments and suggestions.

The students were asked to mark their answers on a four-level scale (1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree). Several authors (Flower, 2009; Schuman and Presser, 1996; Garland, 1991) compared the use of an even-numbered Likert scale, as in the current study, versus an odd-numbered scale that also includes a mid-point such as 'no opinion.' The conclusions tend to favor the four-level scale method because the middle choice in the even-numbered scale may be a refuge for not answering. In addition, the four-level scale method is likely to reduce social desirability bias arising from respondents' desires to please the interviewer or not be seen to give an unacceptable answer.

To avoid bias in the students' answers because of the tendency to answer positively to questions, 11 items in the questionnaire appeared in a negative form (see examples in the Findings section). The answers to these items were converted to a positive scale in the data analysis.

Open-ended questions in the questionnaire

The students were asked to explain their answers or give examples in their own words after each of the 26 above-mentioned closed-ended items. We will relate to this component as the open-ended part of the questionnaire.

Interviews

Semi-structured interviews were carried out with 25 randomly selected students, 5-8 from each school. The researcher held about half-hour interviews with the students in groups. At the beginning of conversations with

the students, the interviewer presented questions to them that were similar to those included in the questionnaire. Yet, the discussion was not limited to these questions and often moved to points raised by the students. The interviews were recorded and transcribed.

Method of qualitative data analysis

In the qualitative data analyses, we followed the common phases of qualitative interpretive analysis (Tutty, Rothery and Ginnell, 1996): 1) open coding of meaning units; 2) categorization of codes; 3) examining the relationships among them; and 4) imparting meaning. In the current research, however, the categories are also examined in light of the activity theory model (Figure 1). Yet, in analyzing the qualitative data collected from both the open-ended part of the questionnaire and the interviews, we aimed at revealing students' views not only about the five categories of the activity system, but also about other aspects relating to learning in school that we were unable to identify in advance.

4. Findings

In this section, we first present the outcomes from the closed-ended part of the questionnaire that the students filled in about the five major categories of the activity system model: Object, Tools, Community, Rules and Division of Labor. Then we summarized the results of both the quantitative and qualitative findings.

4.1 Overview of Students' Answers to the Close-Ended Items in the Questionnaire

The questionnaire included 26 Likert-type items relating to the five categories of the activity system. The students marked their opinion about each item on a scale of 1 (strongly disagree) to 4 (strongly agree). Table 1 and Figure 3 show the average scores for the different categories obtained in each school, as well as for the entire sample. The internal reliability (consistency) of the findings was checked by calculating the Cronbach's Alfa coefficient, showing the result $\alpha = 0.815$. In addition, we were interested in examining the extent to which the average score indicates a positive or negative orientation among the students for each category. To this end, a t-test was performed between the average score of each category in comparison to the midscale value of 2.5, as also marked in Figure 3.

Table 1. Outcomes of students' answers to the questionnaire about the five categories of the activity system (1= strongly disagree; 2= disagree; 3=agree; 4 strongly agree).

		School 1 n=22	School 2 n=18	School 3 n=12	School 4 n=17	Total N=69
Rules	$\overline{X}$	**2.2443***	**2.4141***	**2.6364***	**2.3676**	**2.3825***
	SD	0.26299	0.24883	0.69474	0.44955	0.42226
Tools	$\overline{X}$	**2.7386**	**2.7344**	**2.5682**	**2.500**	**2.6477**
	SD	0.52029	0.43271	0.57108	0.63122	0.53883
Community	$\overline{X}$	**2.8258***	**2.8519***	**2.6528**	**2.8038**	**2.7971***
	SD	0.40655	0.46754	0.50482	0.47593	0.45272
Division of Labor	$\overline{X}$	**2.8409***	**2.9412***	**3.6625**	**2.8382**	**2.9044***
	SD	0.45235	0.54148	0.62272	0.50730	0.5167
Object	$\overline{X}$	**3.5682***	**3.4861***	**3.4167***	**3.5588***	**3.5181***
	SD	0.34660	0.64439	0.50377	0.50377	0.46241

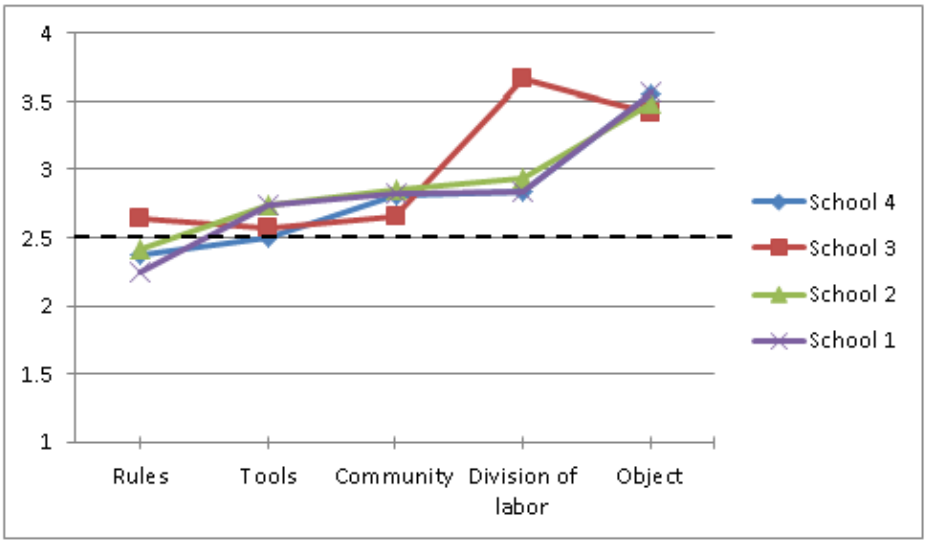

Figure 3. Mean scores of students' answers to the open-ended questionnaire

The data in Table 1 and Figure 3 indicate that in most cases, the mean scores of answers marked by the students in the four schools for each category were quite close to each other (except answers by group 3 to the Division of Labor category). A one-way analysis of variance (ANOVA) showed no significant difference among the four classes in students' answers to the five categories in the questionnaire.

One can see that the total mean score for rules is $\bar{X}$=2.3825, somewhat less than the midscale value $\bar{X}$=2.5, and the total mean score for tools is $\bar{X}$=2.6447, a little above the midscale. The students expressed more positive views about Community ($\bar{X}$=2.7971), Division of Labor ($\bar{X}$=2.9044) and Object ($\bar{X}$=3.5181). Statistically, in all of the cases except Tools, the mean scores differ significantly from the midscale value $\bar{X}$=2.5. In summary, the students regarded the aspect of Rules as being the least important aspect of learning in schools, and the category of Object as being the most important. These findings are also supported by students' answers to the open questions in the questionnaire and in the interviews, as shown in the following sections, in which we relate in more detail to students' viewpoints about the five main categories of the activity system in the close-ended and open-ended parts of the questionnaire, and in the interviews. To reflect the relative importance students afforded to each category, we discuss the outcomes in descending order.

4.2 Object

The Object category in the questionnaire related to the process and outcomes of learning in school, and included items such as "I learn to succeed in life" and "It is possible to succeed in life without learning" (negative form). As mentioned above, the students not only marked their attitudes to these statements as Likert-type items, but also freely wrote their opinions in an open section in the questionnaire and discussed the same points with the interviewer. Many students specifically said that success in school is important for their future. The participants had the following comments:

"I know that I want to study in university and in order to do this I must invest time and effort and do everything possible so that I can become a doctor."

"I want to get a good job so that I can make a good livelihood. Who will hire me today if I don't have good grades?

In the discussions with the students, we identified that many associate success in learning, and achieving high grades in particular, with feelings of satisfaction and happiness, or sadness and frustration in the case of failure. In this context, the students said things such as:

"I feel good when I get good results… It is a pleasure to come home and show my mom the 100 I received"(in Israel, grades are given on a scale of 0-100).

"It makes me happy when I succeed in my studies; there is nothing better than this."

"When I invest efforts in my studies and get no results, I could cry."

It is worth mentioning that while we asked the students' just about their objectives of learning, they also raised the emotional side and their families 'expectations.

4.3 Division of Labor

The Division of Labor category included four items in the questionnaire, for example, "I invest great efforts in learning" and "I have no energy to invest in learning" (negative form). As seen in Table 1 and Figure 3, the students answered these questions quite positively ($\bar{x}$=2.9044on a scale of 1-4). In the open answers in the questionnaire and in the interviews, the participants presented diverse perceptions about working hard. Many students reported that they were investing a great deal of time and efforts studying at home. For example, one student wrote:

"Indeed it (homework) requires lot (of work) from me; sometimes I don't have time to play on the computer or talk on the phone because I'm studying."

In contrast, another student wrote

"Studying all the time is at the expenses of my activity in Scouts; I also want to do things for myself."

Yet another student said:

"I don't have the energy to study all the time; it is not fun; I am like a robot… I have a brain and I will succeed in life even if I study less."

The above students' remarks reflect the norm in Israeli schools about giving the students a great deal of homework. A contradiction was shown here between students' wanting to succeed in school, on the one hand, and their desire to engage in private life and social activities outside of school, on the other hand. In the Discussion section, we will address this issue from the perspective of activity theory.

4.4 Community

The Community category in the questionnaire included questions about the support students get regarding studying with friends, teachers and the family. As we have already seen (Table1), the average score the students marked for this category in the closed-ended questions was moderately positive. In their answers to the open-ended questions and in interviews, a few participants had comments such as:

"I love to study with my friends; we explain things to each other so they are understood better."

A significant number of students mentioned that they get help from their parents, sisters and brothers, or even from private tutors. For instance:

"When I am overloaded and don't understand the homework, my sister always sits with me… my parents help me a lot."

The students 'answers above relate just to studying at home. Since the conventional teaching method is still common in our schools, the students' rarely see the class as a place for studying with peers. Yet, it is a surprise to some extent to find that the students regard their parents, rather than their friends, as study partners.

4.5 Tools

The term Tools in activity theory includes both physical artifacts and mental tools such as language and symbols. In the closed-ended questionnaire, the students marked their position about items such as "I use textbooks a great deal" and "The computer helps me only a little in learning" (negative form). The participants also wrote their opinions about using learning aids in the open-ended part of the questionnaire and discussed them with the interviewer. As shown in Table 1, the mean score of students' answers to close-ended items in the questionnaire was quite close to the midscale value 2.5 with no significant difference. In the open answers either in the questionnaire or the interviews, the students showed a middle viewpoint about the contribution of Tools to learning.

4.6 Rules

This category is about school rules, for example, study hours, behavior in school and homework preparation. The students expressed their perceptions about school rules by answering 8 items in the Likert-type questionnaire, freely expressing their opinions in writing on the questionnaire sheets and verbally in the interviews. The average score of students' answers to the closed-ended questions in the questionnaire was 2.38, a little below the midscale value 2.5 ($p<0.05$). This indicates that the students are not very positive about school rules; they accept some school rules but not all of them. For example, the vast majority of students agreed that rules help keep order in school. Most students also agreed that exams and grades are important for motivating students to learn

and in providing them with feedback about their achievements. In contrast, a significant number of students complained about specific issues, such as long study hours, homework requirements, or the need to wear school uniforms. However, do students see a connection between school rules and learning? We will address this point later in the paper.

4.7 Relationships between Students' Perceptions about the Main Categories in the Activity System

A central notion regarding the activity system described by Engeström (Figure 1) involves examining either correlations or contradictions within or between elements in a system. This can help in understanding the parameters that contribute to or hinder the success of an activity in fields such as education, health services or the workplace. In the current study, we were interested in exploring to what extent students' perceptions about the different categories in the activity system relate to one another. To this end, a correlation matrix between the scores the students marked for the five categories –Object, Division of Labor, Community, Tools and Rules – was computed, as presented in Table 2.

Table 2. Correlation anlysis of students' answers to the close-ended questinnaire

	Rules	**Community**	**Tools**	**Division of Labor**	**Object**
Rules	1				
Community	0.301	1			
Tools	0.151	0.491	1		
Divisor of Labor	0.385	0.590	0.238	1	
Object	0.175	0.368	0.101	0.616	1

The findings indicated that the highest correlation was determined between the Division of Labor and the variables Object (r=0.616) and Community (r=0.616). The lowest correlation was found between the Tool and Object (r=0.101) variables. To examine more closely the relationships between these three pairs of variables, a scatter plot for each case was graphed, as illustrated in Figures 4-6.

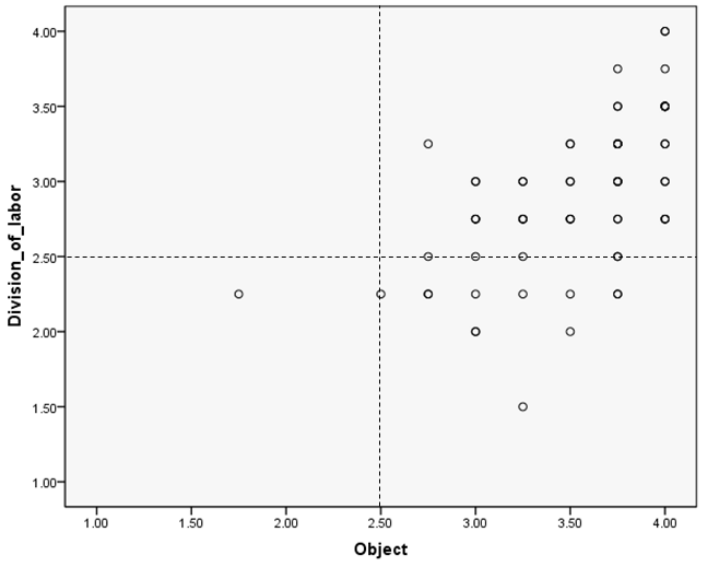

Figure 4. The relationships between students' answers about the Division of Labor and Object categories

In Figure 4, each point on the chart represents the average score a student marked for the four items relating to Object (horizontal axis) and the four items relating to Division of Labor (vertical axis) in the questionnaire. Although the sample included 69 students, fewer points are shown on the chart because some points overlap. The chart shows the distribution of students' answers to each variable on a scale of 1-4 and the relationship between

the answers to the two variables. It can be seen that the answers by most students to the questions relating to Object were higher than the midscale value of 2.5, meaning positive answers. Yet, a significant amount of participants' answers to questions about Division of Labor appeared below the midscale value of 2.5; namely, not all students expressed positive attitudes about making efforts to learn in school. The distribution of students' answers between the vertical and horizontal axes in Figure 4shows a positive correlation between their perceptions about the two variables discussed: the more a student appreciates learning the more he/she supports investing efforts towards achieving this end.

In Figure 5 as well, one can see that a positive correlation exists between students' perceptions about Division of Labor and Community. As previously noted, the students in the current study related more to getting help from their parents while studying at home rather than studying with their peers in school. The more students are motivated to invest efforts in learning, the more they positively regard their parents' help.

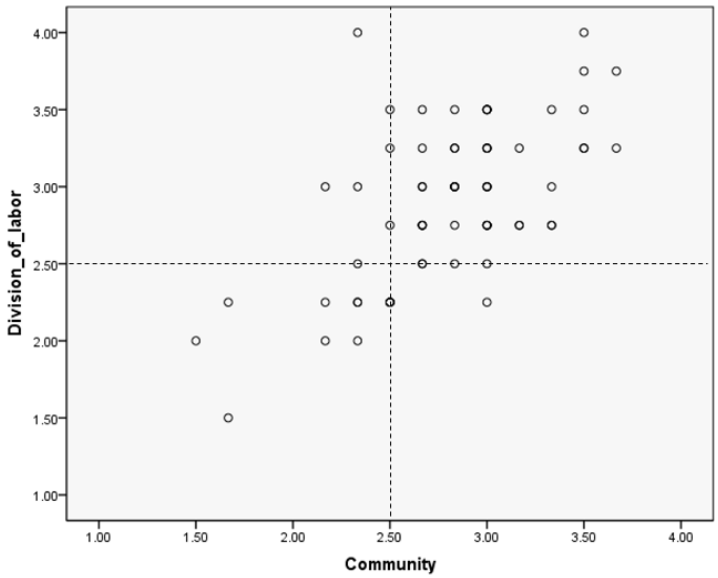

Figure 5. The relationships between students' answers about the Division of Labor and Community categories

Finally, a different picture appears upon examining the distribution of students' answers to the Tools and Objects categories, as presented in Figure 6. We can see that while almost all of the students answered positively about Object, their answers about Tools, for example, books and computers, were below and above the midscale value of 2.5. No connection exists between students' perceptions regarding these two variables.

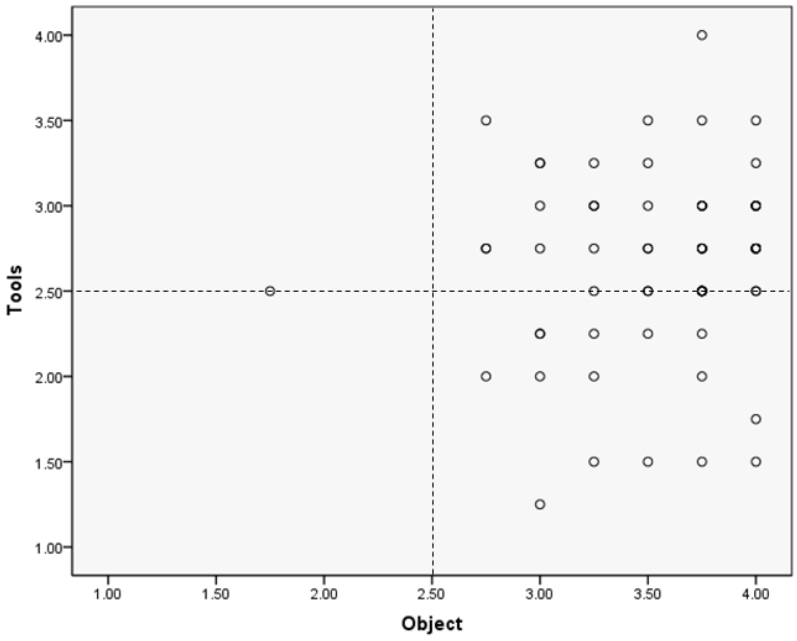

Figure 6. The relationships between students' answers about the Tools and Object categories

5. Discussion

The current research aimed at exploring students' perceptions regarding the five main categories in an activity system: Object, Tools, Division of Labor, Community and Rules, and possible relationships that exist between these conceptions. Earlier in this paper, we saw that the roots of activity theory lie in the work of Vygotsky (1978) and his follower Leont'ev, who emphasized that human higher mental functions are products of mediated activity. Internal (mental) and external (physical) mediating tools and artifacts play a major role in the transformation process. In our case, the subjects were junior high school students. The Object, namely the space or recipient to which the activity is directed to, is learning in school. Internal tools are, for instance, language or mathematical symbols; external tools are, for example, books and computers. McDonald et al. (2005) write that "Vygotsky connected material and mental tools through their mediation function, that is they both fall into the same psychological category. All manner of things have been considered as tools if their function or their consequence is mediation" (p. 114). Engeström (1987) proposed the activity system model, which aims at also considering the social and cultural circumstances in which an activity takes place. To this end, the activity system model includes three additional components: Rules, Community and Division of Labor, as illustrated in Figure 1. Engeström (2001) used the term 'learning by expanding' to assert that individuals are not just affected by the different categories of an activity system but they also continually develop and renew them. We have also seen that the third generation of activity theory suggests that we simultaneously examine a number of activity systems that individuals might be engaged in to understand dialogue, multiple perspectives and voices, and networks of interacting activity systems (see Figure 2).

The findings obtained in this research shed some light about several important aspects of how students assess the different activity system components. One point that arises from the findings is that the students had the lowest opinion regarding the Rules category. Generally, rules have to do with norms and regulations that guide individuals' activities within a system. In the school context, rules are about issues such as study hours or the need to prepare homework. The current findings show that the students express poor support of school rules and do not correlate them to their success in learning or their long-term future. These results match other studies showing that students do not appreciate school rules because they are not involved in deciding about these rules. Theoretically, school rules should balance between students' rights and responsibilities (Schimmel, 1997). Yet, a range of studies in countries such as Britain (Davies, 1999), Ireland (Devine, 2002) and Canada (Raby, 2008) showed that students often have only little to say about school rules. The need to consider students' views about school rules is part of a broader notion of listening to 'student voice'. McIntyre, Pedder and Rudduck (2005)

found that year eight class students expressed constructive views about what helps learning in school. Although the teachers in this study tended to respond positively to students suggestions, they differed in what they did in respond to these ideas. Thornberg (2008) found that students criticize school rules, distrust teachers' explanations of particular school rules, perceive some of school rules as unfair and inconsistent, and perceive no power over the construction of school rules. On the other hand, Rudduck and Fielding (2006) warn that the popularity of students' voice can lead to surface implementation that focuses on 'how to do it' rather than 'why we might to do it'. These authors highlight that developing students' voice requires building a whole-school culture in which student voice has a place. In summary, as students have only little influence on school rules, it is of no surprise that they do not regard them as contributing to learning.

A second point that we learn from the findings is that students ascribed only a moderate positive value to the Tools category. According to activity theory, mental tools such as language and signs, and physical artifacts such as books and computers, play an important role in cognition and learning. The answers the participants wrote in the close-ended and open-ended parts of the questionnaire or said in the interviews indicate that although the students use various aides for learning subjects such as mathematics or science, these tools are not of high importance in their opinion. This situation reflects the fact that in the traditional instructional method that still dominates our school system, students look to the teacher as the main source of knowledge, while they regard written materials as 'extra' means or just a source of exercising what they learn in class. Moreover, science teachers sometimes avoid assigning text reading for the students because the books do not exactly match what is learned in class, students' prior knowledge or their reading competences (Fanga et al., 2008; AAAS, 2002). Although the vast majority of Israeli students have computers at home and schools are making efforts to accelerate the use of technology for teaching and learning, the current findings reveal that students do not regard the new technologies as meaningful aides for learning. This picture also explains the fact that no correlation was found between students' answers to the Tools and Object categories, as illustrated in Figure 6. This means that students do not regard the use of learning aides as contributing significantly to learning.

Another point that arises from the findings is that students answered positively to questions about Community aspects in the activity system model. However, similar to the case of Tools, the participants' perceptions were moderate rather than decisive. Generally, the term community is about learning from and with others. In school context, the community for students could include peers, teachers or out of school experts. However, in the traditional schooling that characterizes our educational system, students commonly have only little opportunity to collaborate with their friends or work with others in school. Actually, students' best 'partners' for learning often are their parents who help them in preparing homework. Many authors (see, for example, Desimone, 1999; Harris and Goodall, 2008) suggest that parental involvement in their children's learning in home makes a great difference to student achievement (although more information is needed about how the effects of this involvement vary for students from disparate racial-ethnic and economic backgrounds). In the current study, we found a positive correlation between students' conception about Community, merely in terms of getting help from parents, and Division of Labor, as seen in Figure 5. These findings hint that getting help from others could encourage students to increase their involvement in learning.

At this point of the discussion, it is useful to remind that activity theory is closely associated with the social-constructivist view of learning and cognition; learning is regarded as process of growth and development and higher mental functions are considered as having social and cultural origins. Since our educational system, unfortunately, has to do more with the 'delivery' of knowledge and a standard curriculum, it is not surprising that students' attitudes towards the aspects of Rules, Tools and Community in the activity system model was only partially positive or supportive.

Students' perceptions about the Object and Division of Labor categories were the most positive among the current findings. As we have seen in the Findings section, the students participating in the study accepted that learning in school is important for their future. The significant correlation between the Object and Division of Labor variables indicates that the students were aware of the connection existing between these aspects rather than examining them separately.

Earlier in this paper, we mentioned that according to the third generation of activity theory (Engeström, 1978, 2009), it is important to take into account that individuals are often engaged simultaneously in several activity systems partially sharing a common object, and to examine possible constraints or contradiction between elements in an activity system or between different systems, as illustrated in Figure 2. In the current case, a close examination of students' answers to the Object and Division of Labor categories revealed that many students' complained about having to stay long hours in school and prepare a lot of homework, which prevented them from participating in afternoon activities such as sports, music, youth movement and volunteering in the

community. This brought us to identify that a contradiction exists between students' activity entitled 'learning in school' and another activity we can call 'social life.' In addition, we have seen that success in school is important to many students because of their families' expectations, and that many parents are involved in helping their children prepare homework or other school assignments. In other words, students' 'learning in school' activity also has to do with an activity system we can call 'family.' In summary, the third generation of activity theory helps us get a broader picture of students' learning in school and other related activities, as illustrated in Figure 7.

All the three activities systems presented in Figure 7 relate to the same subject –students, and partially share the object of students' development. All three systems encompass Tools, Rules, Community and Division of Labor, which might partially overlap between the three systems. Contradiction or tension might appear either within elements in a system, between them or between two different systems, for example, learning in school and social life mentioned above, or between students' activities with their families and their desire to participate in social activities with their friends.

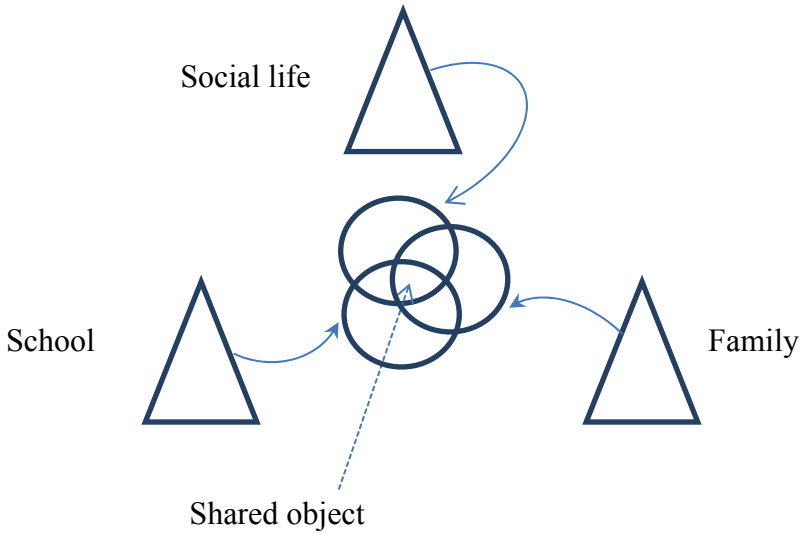

Figure 7. Third generation of activity theory: a framework for examining the interaction between several activity systems students are involved in

6. Summery and Conclusion

Dakers (2011) notes that activity theory teaches us that the quality of learning is determined by the nature of students' activity and the social and cultural context in which the activity takes place. In the current research, we used activity theory as the conceptual framework for exploring students' perceptions about learning in school. In referring to Engeström's (1978) activity system model, the subjects in this model are the students and the object is the activity of learning in school; learning takes place by means of mediation tools and relates closely to three contextual factors: Rules, Community and Division of Labor. According to Engeström's notion of 'learning by expanding,' learning occurs when individuals are not just influenced by these factors but also interact with them and mold them. From this perspective, the current study provides insights as to how students regard learning in school from the viewpoint of an activity system.

Firstly, we found that the students understand and appreciate the importance of learning for their future and are ready to invest efforts in succeeding in school. This is an important point because it counters the common complaints that students do not want to learn or do not care about school. Secondly, the findings indicated that students afford only moderate importance to the contribution of tools such as books and computers to learning. According to activity theory, both mental and physical mediating tools play a central role in the process of cognition and learning. In the current study, however, the findings show that students consider the teacher as the main source of knowledge, while books or computers are just complementary aides for learning or practicing the required subject matter. Thirdly, although according to activity theory community plays a major role in learning, our students have very little opportunity to collaborate with their peers or other people in learning either in school or at home; they see just their parents as a useful sources for help in studying at home. Fourthly, it was found that students do not feel that school rules contribute to learning; this has to do with the fact that these rules

are imposed upon them and the students are not involved in forming them or deciding about them.

Students' perceptions about learning in school have a great impact on students' developmental needs during early adolescence (Connell and Wellborn, 1991; Eccles et al., 1993). The model of activity theory helps in breaking down the school system components and understanding the factors that affect students' learning and motivation. As found in this study, schooling based on a standard curriculum and traditional teaching methods, makes it difficult to create a constructivist learning environment in which students interact with Tools, Community, Division of Labor and Rules, and take an active part in forming and molding these aspects of learning, as derived from activity theory.

An additional important point the current study highlights is that in parallel to learning in school, students might be engaged in other activities, for example, social or family activities. The third generation of activity theory (Engeström, 2001) guides us to examine a number of activity systems simultaneously that might occupy students and pay attention to possible tensions or contradictions prevailing between these systems.

In conclusion, the outcomes of this study provide us with a meaningful perspective as to how students perceive school improve in order to help educators in their efforts to reform our educational system.

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