# ASSESSMENT OF LEARNING-TO-LEARN PROCESSES IN STUDENTS

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## Abstract

*Concept of learning -to - learn is a key competence for lifelong learning which is one of the most critical demands of the new educational reforms in Georgia. The core of learning to learn is formed through good educational practices. Learning-to-learn is defined as the competence and the willingness to adapt to novel tasks, which activates person's affective and cognitive processes and leads to learning action (Hautamaki, et al., 2002).*

*National Curriculum and Assessment Center of Georgia, Assessment Unit developed the special measurement instrument for learning to learn (L-t-L) assessment in students. The purpose of the study was to analyze whether students grouped by their self-assessed level of success differ according to their L-t-L components assessed by our L-t-L measurement instrument and in general, to reveal the most influential factors of L-t-L for Georgian context.*

*Our Sample comprised of 1007 students of 38 schools located in the different regions of Georgia. Analyzing results by factor analysis, anova, and non-parametric measures showed that students having better performance on L-t-L components have higher self-assessed academic performance.*

*These results show the highest importance of Learning-to-learn assessment. Its inclusion as a distinct indicator in educational evaluation system would provide a means to analyze the relative role of the different factors affecting student's achievement, and help direct schools towards practices and contents that would truly foster lifelong learning.*

**Key words:** *learning-to-learn, lifelong learning, educational evaluation, self-assessment, educational reform, academic performance, educational achievement.*

## Introduction

Term "learning-to-learn" is a key notion of the modern school educational conception. Learning-to-learn has been analyzed in educational literature since 1970's and 1980's. According to one definition learning to learn is "the ability and willingness to adapt to novel tasks, activating one's commitment to thinking and the perspective of hope by means of maintaining one's cognitive and affective self-regulation in and of learning action" (Hautamaki, et. al., 2002, p. 38). Another definition of learning -to-learn highlights that it is a process in which a person manages his/her learning including planning, assessing, and constant monitoring of his/her own learning (Flavell,1977).

The key of learning to learn is to form an individual who is an active learner and independent

decision maker. These are the main attributes of a lifelong learner who is able to adapt to the novel tasks through activating his/her complex system of interrelated competencies and beliefs, leading to learning action. Mastery of learning action through affective and cognitive self regulation forms the core of learning to learn. Thus, learning to learn is formed due to good educational practices and accompanies all achievements (Hautamaki, et. al. 2002).

A critical demand of the new educational reforms in Georgia is to foster students enable to life-long learning. It augments the importance of assessing learning to learn instead of assessing subject knowledge of students. This approach is very different from the traditional approach of post soviet school conception focused solely on subject specific assessment. Learning-to-learn assessment implies assessment of the basic life skills through which student masters in solving of the new tasks. The goal of the assessment of L-t-L is to establish factors that lie behind the variation between the groups of students with different academic successes. In addition, studying the relative role of the different factors in the success of an individual student has a pivotal importance.

Learning-to-learn competencies are comprised of three subcomponents: context related beliefs, self related beliefs and learning competencies. Context related beliefs consist of perceived societal norms and values of schooling itself. These beliefs are formed through perceived support for learning and studying that is implied in parents, teachers, schoolmates or significant others' attitudes. Self-related beliefs include learning motivation, action-control beliefs, academic and social self-concept, and anticipation of own future. Learning competences incorporate learning and reasoning domains as well as management of learning (study skills).

Our study aims to design a measurement instrument of learning-to-learn and to assess how the groups of students of various self-assessed academic achievements (law, medium, high) differ significantly according to their learning-to-learn components.

## Methodology of Research

*Respondents*

38 piloting schools of the different regions of Georgia were selected by cluster sampling. 1007 students of 10th and 11th grades participated in this study.

*Measures*

The content of the measures was developed using focus groups. Totally 14 focus groups were conducted in the different regions of Georgia. Adolescents were interviewed with open-ended questions regarding learning motivation and processes. These focus groups were used in order to inform the language (slang) used in the questions. In addition, the most frequently mentioned categories were used to construct the closed-format questions for each variable category used in the survey. The survey was pilot tested for readability and comprehension.

Mostly we structured our items in such a way that respondents use a five-point disagree-agree likert type scale. L-t-L Questionnaire included 49 questions measuring context related beliefs, self-related beliefs and learning competencies. Academic performance in the specific subject was self-assessed by the students themselves using 5 point scale (1- not at all – 5 completely successful);

In general, measurement instrument is based on the Learning- to- learn instrument constructed by the finish scientists (Hautamaki, et al., 2002).

*Procedure*

Trained instructors conducted self-administered "paper and pencil" format survey. Instructors reviewed instructions orally in order to eliminate warm-up effects and ensure scale understanding. In order to encourage truthful responding, instructors assured adolescents that their responses would be confidential and explained to them the difficulty in linking a name to a questionnaire.

All participants were informed that participation was voluntary and they could choose to withdraw from the study at any time and they could choose not to answer any question they would

prefer not to answer.

*Analysis methods*

Factor analysis has been used to extract factors that are underling constructs of learning-to-learn. One way analysis of variance and Kruskal-Wallis H (nonparametric measures) were used in order to find out whether students grouped by their level of self-assessed academic success differ significantly from each other by their learning-to-learn components.

## Results of Research

*Constructing of learning-to- learn (L-t-L) measurement instrument*

Below are described the main factors of L-t-L identified within the context related beliefs, self-related beliefs and learning competencies.

Context related beliefs:

1. Parent's role in his/her child's learning process

   Based on Factor Analysis 3 main factors were extracted from 12 different statements (it included the same amount of positive and negative statements); (Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0, 8; Bartlett's Test of Sphericity, $p$=0);

   - Parent's adequate assistance to child (parent gives me detailed comments on assignment - 0,8; parent explains me the teaching methods that would help me to understand a new material - 0.8; parent assists me to do assignments in time - 0.7);
   - Parent's belief in his/her child's current and future successes (my parent believes that I can do well any school exercise which I decide to do - 0.8; my parent believes that I will become a successful person in the future - 0.7)
   - Parent's inadequate assistance to child (parent's advise to me is vague - 0.7; my parent does my exercise on behalf of me, if I can't do it - 0.7)

2. Teacher's role in his/her student's learning process

   Based on Factor Analysis 6 main factors were extracted from 26 different statements (it included the same amount of positive and negative statements); (Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0, 9; Bartlett's Test of Sphericity, p=0);

   - Adequate teaching methods used by the teacher (teacher is objective to students - 0.6, teacher explains a new material clearly - 0.6; teacher involves me in active learning process in order to attract the subject to me - 0.6)
   - Teacher's belief in the student's current and future successes (teacher believes that I can do well any school exercise which I decide to do - 0.8; teacher believes that I will become a successful person in the future -0.8)
   - Teacher's attempt to develop transfer skills in students (teacher stresses on how we can transfer the skills taught in one subject to another subject - 0.7; teacher uses practice teaching methods to connect subject with my real experience - 0.5);
   - Teacher's inadequate behavior in classroom environment that interfere with the student's learning (teacher insults me when I could not answer the questions - 0.6; Teacher's advises are vague - 0.6; Teacher does not pay attention at me when I could not answer the question - 0.5);
   - Teacher's adequate feedback to the student (teacher gives me comments on assignment in time - 0.8; teacher gives me detailed comment on my assignment - 0.7);
   - Teacher's attempt to activate the student's thinking skills (teacher gives me some prompts when I could not answer the question - 0.6; Teacher attempts to use the specific questions so I could guess the answer - 0.5);

3. School's role in student's learning process

- How well does your school satisfy your learning interests? (scale: 1 not at all – 5 completely);

4. Schoolmates' role in student's learning process
   - I learn some subjects by influence of my classmates (scale: 1 strongly disagree - 5 strongly agree);
   - I learn some subjects less by influence of my classmates (scale: 1 strongly disagree - 5 strongly agree);

Self-related beliefs:

1. Learning Motivation while doing homework

   Based on Factor Analysis 2 main factors were extracted from 8 different statements (it included the same amount of positive and negative statements); (Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0, 8; Bartlett's Test of Sphericity, $p$=0);
   - Internal learning motivation (I enjoy doing my homework-0.8; It is fun to do homework - 0.8; It's important to me to do my homework - 0.7);
   - External learning motivation (I want the teacher to think I am a good student - 0.8; I'll get in trouble if I don't - 0.8);
2. Learning motivation while doing class assignments

   Based on Factor Analysis 2 main factors were extracted from 8 different statements (it included the same amount of positive and negative statements); (Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0, 8; Bartlett's Test of Sphericity, $p$=0);
   - Internal learning motivation (I enjoy doing my class assignments - 0.8; It is fun to do class assignments - 0.8; It is important to me to work on my class assignments - 0.8);
   - External learning motivation (I want the teacher to think I am a good student - 0.8; So that the teacher won't yell at me - 0.8);
3. General factors of student's academic self-regulation

   Based on Factor Analysis 3 main factors were extracted from 13 different statements (it included approx. the same amount of positive and negative statements); (Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0, 8; Bartlett's Test of Sphericity, $p$=0);
   - Orientation to get benefits from the society, orientation on the future (I want that people respect me - 0.7; I want to become an active member of the society - 0.7);
   - "Here and now" factors of academic self-regulation (Learning is simply enjoyable for me - 0.7; It is important for me to be a successful student - 0.6);
   - Surface learning (I study because I want to impress the opposite sex classmate - 0.8; I study because others force me to do so - 0.7);
4. Affective self-regulation
   - How often do you monitor your homework to see whether you have made mistakes (scale: 1 never – 5 always);
   - How much are you involved emotionally in experiencing your academic successes or failures? (scale: 1 not at all – 5 very much) ;
5. Action –control beliefs – (self-efficacy, task value and anticipated interest)

   (Reliability coefficient, Chronbach Alpha - $a$=0,7);
   - To what extent was clear today's lesson's aim and topic?
   - How well do you understand the goals and objectives of the specific subject?
   - How clear is it for you in which case you get higher and/or lower grades?
   - How well do you understand what results (knowledge and skills) would you gain after the successful completion of the specific subject domain?
   - How well do your assignments and activities performed in the specific subject

domain lead you toward the results that are intended by the curriculum (the subject program) itself.

6. Self-conception

   Based on Factor Analysis 2 main factors were extracted from 9 different statements (it included approx. the same amount of positive and negative statements); (Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0, 8; Bartlett's Test of Sphericity, $p$=0);

   - Academic related self-conception (I am very diligent student- 0.8, I enjoy learning - 0.8, I am actively involved in the learning process - 0.7);
   - Social self-conception (I am independent - 0.7, I can solve the problems easily - 0.7, I have good communication skills - 0.6);

7. Self-confidence
   - How much are you self-confident (scale: 1 not at all - 5 very self-confident)
8. Orientation toward the future and experience of happiness (current and future)
   - After completion of school my future will be unsuccessful (1), less successful (2), not certain (3), successful (4), completely successful (5);
   - How much happier do you feel yourself currently (5 faces of different levels of happiness – 1 less happy – 5 very happy);
   - How much happier would you feel yourself in the future (5 faces of different happiness – 1 less happy – 5 very happy);

Learning competencies:

1. Learning skills - knowledge and actual use of concrete operations while accomplishing an assignment (Reliability coefficient, Chronbach Alpha $a$=0, 8).
   - How often do you use these strategies while accomplishing your assignment?
   - (scale: 1 never- 5 always)
   - What knowledge do I have to fulfill this assignment?
   - What knowledge would help me to accomplish this assignment?
   - Do I use properly the knowledge I have?
   - In the case, if I am mistaken, do I know how to correct this?
   - I ask myself if I made assignment properly;
   - I monitor myself constantly if I have achieved my goal;
   - I monitor myself if I have to go back to see if something needs to be improved;
   - I am looking for the alternative ways of solving this assignment.
2. Learning skills - knowledge and actual use of concrete operations while studying a lesson (Reliability coefficient, Chronbach Alpha $a$=0, 7).
   - How often do you use these strategies while studying a lesson?
   - (scale: 1 never- 5 always)
   - I read well the text from the beginning to the end and then start studying;
   - While I studying I try to connect what I have learned in class and what I read in the text;
   - I stop while reading and try to understand what I have just read;
   - While reading I highlight the text to make important notes;
   - I use remarks I made during the lesson;
   - I rewrite the main purpose of this study text (I remember things while writing);
   - I answer the questions which are given after the study text even it is not required;
3. Learning strategies while listening in class

   Based on Factor Analysis 2 main factors were extracted from 8 different statements (it included the same amount of positive and negative statements); (Kaiser-Meyer-Olkin

Measure of Sampling Adequacy = 0, 8; Bartlett's Test of Sphericity, $p$=0);

- Active participation (I put in order the newly received information - 0.7, I actively listen to the teacher - 0.7, I made sense from the newly explained material - 0.7);
- Passive-destructive participation (I disturb the teacher while she/he explains a new material - 0.7, I stay quietly - 0.7);

*LtL componnets in relation to the self-assessed academic achievement in the specific subject*

Students were grouped according to their self –assessed academic success in the specific subject. Three different groups were identified (see table #1).

**Table 1. Students' distribution by groups according to their self-assessed academic successes.**

| Groups | Frequencies |
|---|---|
| Less Successful | 64 |
| Average Successful | 331 |
| Successful | 598 |
| Total | 993 |
| Missing cases | 14 |

Statistical analysis revealed that students who consider themselves as successful in the specific subject are significantly different from the other groups (average and less successful students) and have better performance on L-t-L components, in particular, context related components (A) parent believes in his/her child's current and future successes, (B) minimal inadequate assistance to child by the parent, (C) teacher uses adequate teaching methods (D) teacher believes in the student's current and future successes, (E) teacher attempts to develop transfer skills in the student, (F) school satisfies student's learning interests, (G) less influence of classmates in not studying a subject well; self-related components (A) high learning internal motivation while doing homework and class assignments, (B) less external high motivation while doing class assignments, (C) more orientation to get benefits from the society, orientation on the future, and (D)"here and now" factors of academic self-regulation; (E) less surface learning, (F) frequent control of own mistakes, (G) sensitive toward academic successes/failures, (H) strong action-control beliefs- self-efficacy, (I) strong academic self-concept, (J) strong social self-concept, (K) self-confidence, (L) more orientation to successful future, (M) more current happiness, (N) more future happiness; learning competencies (A) advanced in learning strategies while working on assignments, (B) advanced in skills for studying a lesson, (C) active participation in class, (D) less passiveness and destructiveness;

Thus, the groups of students (law, medium, high self-assessed academic achievement) differ by their L-t-L components - context-related, person-related and learning competencies. Some of these components have a bigger influence than others, in particular, academic self-conception (Eta squared 17.2%), active participation in class (Eta squared 15.9%), internal learning motivation (Eta squared 14.9%, 10.7%), advancement in study skills (Eta squared 13.7%, 10.4%), teacher's usage of adequate teaching methods (9.9%);

## Conclusions

The research shows that Learning-to-learn is a precise indicator for anticipating students' academic self-assessment. A student who has a better performance on L-t-L becomes actively involved in the learning process and achieves better academic results, in particular, develops high academic self-assessment. However, learning to learn components and academic achievement have reciprocal effect on each other. A student who receives better academic results, his/her L-t-L components will undergo the major changes, his/her self-confidence, academic and social self-conception will be strengthened, parents as well as teachers' attitudes will become positive, etc.

L-t-L assessment incorporates assessment of cognitive components (learning competencies) as well as affective elements (self-related and context related beliefs); Perceived support by teachers and parents play a pivotal role in the development of affective self-regulation, intellectual competencies and in general, school performance, learning and development. Study skills (cognitive components) influence on students' performance significantly.

These results show the highest importance of Learning-to-learn assessment. Its inclusion as a distinct indicator in educational evaluation system would provide a means to analyze the relative role of the different factors affecting student's achievement, and help direct schools towards practices and contents that would truly foster lifelong learning.

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