

Improvement of Learning Motivation and Negotiation of Learning Disorders of Students Using Integrative Teaching Methodology

Juris Porozovs, Daina Voita, Anda Kauliņa, Toms Voits, and Evita Vaļēviča

Abstract—Integrative teaching methodology is based on connecting and summarizing knowledge from different subjects in order to create better understanding of different disciplines and improvement of competences in general. Integrative teaching methodology was implemented and realised during one academic year in 17 Latvian schools according with specially worked out programme by specialists of different fields for adaptation in social environment of children and young people with learning, cognitive functions and motor disorders. Implemented integrative teaching methodology consisted from three subsections which were specialised for adaptation in social environment, improvement of cognitive functions and improvement and harmonization of personality. The results of investigation showed that the use of integrative teaching methodology is an effective way for improvement of learning motivation and negotiation of learning disorders of different age schoolchildren.

Keywords—Adaptation in social environment, integrative teaching methodology, learning disorders, learning motivation.

I. INTRODUCTION

THE development of an integrative teaching methodology and its successful implementation in pedagogical practice is based on use of complex methods. The methodology uses technology to promote the development of students' personality, increase the learning motivation, overcome learning difficulties and provide better social adaptation and integration of students.

Integrative approach in education is learning, problem

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solving and research by joining up a diverse range of subjects and courses and the knowledge and skills acquired in these classes. It can be done by creating a new course by consolidating many others or by taking an integrative approach towards multiple courses. Integrated studies are aimed towards linking knowledge from a variety of subjects, social, cognitive etc., goals as well as skills and knowledge from curricular and extracurricular cultural life [1]. By studying related subjects in an isolated manner the knowledge is acquired in a disorganized and scattered manner and the child consequently is not forming a systematic view about the world and the way it is organized [2]. Therefore contemporary pedagogy demands the use of integrative teaching methodology to achieve the best results. Integrated teaching promotes the formation of a structured view about the world, secures the formation of a humane and open-minded personality and provides a link between studies in the classroom and the real life, that, in turn, motivates the students to learn and discover how related the different study subjects are. These results in elevated levels of interest, creativity, students are keener to study and the acquired knowledge and skills are better organized and structured. A repetition with modifications consolidates the knowledge even more [2]. The use of the integrative teaching methodology provides a more complete and all-rounded development of children.

The results of investigation revealed that integrative approach among science, technology, engineering and mathematics (STEM) subjects positive effect on student's learning [3]. There are numerous areas of growth with tremendous amounts of connectivity between technology, engineering and science that could be sources of integration. For example fields of biotechnology and bioengineering offer tremendous opportunities for collaboration [4]. With respect to the grade levels, the effects of integrative approaches showed the largest effect size at the elementary school level and the smallest effect size at the college level [3].

Exactly the integrative approach provides the best acquisition of knowledge, skills and attitudes needed in life. It allows the organization of the educational process in such a manner that student gains knowledge not only in a specific field, but acquired general skills that will allow to be successful not only in familiar, but also in unknown and unfamiliar situations [5]. Integrative approach covers the mental (feelings, will and mind), physical and social

development of a student.

Children with learning difficulties and cognitive or motor disabilities are rarely receiving sufficient support and assistance from psychologists, speech therapists, rehabilitologists etc., which results in reduced learning abilities and social skills. Collaboration between a wide range of professionals could result in a production of a truly integrative teaching methodology that would improve student, especially those with learning difficulties, social integration.

Learning difficulties are traditionally classified according to the functional or academic area affected or by which part of information processing is disrupted [6]. In literature learning disorders are usually described with short and precise terms: dyslexia (reading disorder), dysgraphia (writing disorder), dyscalculia (arithmetic disorder), dyspraxia (motor disorders), non-verbal learning difficulties and others [6]. Dyslexia is a specific learning disorder that impairs a person's fluency or acquisition of a normal reading proficiency while having an otherwise normal intellectual development, normal learning and a good sociocultural environment [7]. Reading disabilities are present in 75% of children with learning disorders [8]. Research shows a possible role of genetic factors in development of reading disabilities. 35-40% of children with reading disorders have a close relative with similar or the same disorder. Chromosomes 1, 2, 3, 6, 15 and 18 might be involved in development or dyslexia. Many of these chromosomes are impaired in cases of other learning disabilities [9].

Dysgraphia is a specific learning disability that prevents a person from being able to write or in other graphic ways express his thoughts while having otherwise normal or good intellectual capabilities and normal mental development [6]. A dysgraphia sufferer makes many spelling and grammar mistakes and has a vague understanding about the process of writing [10]. Dyscalculia is a specific learning disorder that impairs one's ability to understand arithmetic regularities and laws and prevents one from understanding even simple mathematical operations despite otherwise normal intellectual and educational development. [6]. Recent research have revealed that dyscalculia emphasizes a core deficit in understanding sets and their numerosities which is fundamental to all aspects of elementary school mathematics [11]. Dyspraxia is a specific reading disorder that affects motor functions, it includes difficulties in planning and performing of both small and large movements [7]. Dyspraxia also influences the logical planning of a speech, because of the impaired ability to move jaw, lips and tongue. Non-verbal learning disabilities are associated with prominent non-verbal deficits such as reduced perceptual and spatial abilities, against background of relatively intact verbal abilities [12]. Non-verbal learning difficulties express in different ways – motor, visuo-spatio-organisational and social.

A variety of factors influence the development of learning disorders. It is known that learning difficulties are associated with brain dysfunction. Changes in the function of the nervous system can induce problems with specific information

processing, causing problems with following the study material. It is thought that cognitive dysfunction arises from a combination of a variety of factors influencing normal growth, development and maturation of the brain, which results in structural damage of the nervous system, cerebral dysfunction, disrupted lateralisation of the brain or problems with maturation of the brain. Heredity plays a large role in the cases of learning difficulties therefore it is essential to acquire the medical history of the child. It has been discovered that it is very common for one of the parents or a close relative to be a sufferer of a similar problem with mental information processing [6]. Early life stress, in the form of violence exposure, is related to neurocognitive deficits. Violence exposed children have an increased risk of developing school – related problems including: mental health problems, learning disabilities, language impairments and other neurocognitive problems [13].

The following means of support to provide an efficient learning process for children with learning difficulties is ensured: special training (or certain skills); compensatory strategies (use of child own resources and putting emphasis on what the child is good at); adjustments; social skills (being able to seek help and defend himself). Teachers help and support is extremely important in reaching goals – with teachers support child becomes more confident and starts to believe in his own abilities as well as experiences joy about his achievements [14]. Use of the integrative teaching methodology can encourage and motivate the students to learn and overcome their learning difficulties.

II. METHODOLOGY OF RESEARCH

An Integrative Teaching Methodology for social adaptation for children with learning difficulties and cognitive and motor disorders was developed within a European Social Fund project framework [15]. This methodology was used in 17 Latvian schools under the supervision of qualified teachers and other professionals (psychologists, speech therapists, psychiatrists, rehabilitologists and psychophysicologists). The Integrative teaching methodology was formed out of three sections: Section A – social adaptation; Section K – development of cognitive skills and Section P – consolidation and harmonization of personality. Each section contained multiple subsections, for example Section A: leading of group work, academic motivation, encouraging and increasing self-confidence etc., Section K: development of attention and concentration, memory training, thought and speech training, etc., Section P: music and movements; colouring of mandalas, development of motor skills, etc. Integrative teaching methodology was carried out for a year. Integrated subjects were carefully planned and taught in a strict order. The methodology was carried out differently for different age groups. The project was started by dividing the students into groups, questionnaire of the participants, altering the methodology to fit certain student groups better and collaboration with parents. Students with learning disabilities,

cognitive, speech and motor impairments were included in the groups, but healthy students with a normal or good academic record were also allowed in the groups.

Students and teachers were from 17 Latvian schools (13 general secondary education institutions, 3 schools for children with special needs, 1 Speech Therapy school, 2 vocational technical schools). Overall 870 students participated in the study. All the participants were surveyed before (Test I) and after (Test II) being taught according to the integrative teaching methodology. Teachers were surveyed about every student learning according to the integrated learning methodology. Only those questionnaires filled out by the same person both before and after learning were included in the analysis. Questionnaires filled out by 615 students were included in the final results. These questionnaires were divided into categories by the type of school (general secondary education or other) and the age of students (grades 3-4; 5-7 and 8-12).

The learning motivation questionnaire was developed by expert psychologists. The questionnaire filled by students consists of 13 statements. Three subscales of the questionnaire were distinguished: internal learning motivation, external learning motivation and amotivation or lack of motivation. Students were required to answer each of the statements with "yes", "rather yes than no", "rather no than yes" and "no". For each "yes", participants acquired 3 points, for each "rather yes than no" – 2 points, for each "rather no than yes" – 1 point and, finally, 0 points for the answer "no". The results were analysed separately for each subscale. Results could vary between 0 and 30 points. In the first and second subscales high results indicate high internal or external learning motivation, but in the third subscale high results indicate greater amotivation or lack of learning motivation.

The learning difficulties questionnaire was developed by a group of highly qualified school teachers for children with special needs and expert psychologists. The questionnaire filled by teachers consists of 41 statements. For each statement three responses are possible: "yes", "no", and "can't tell". For each "yes" participants acquired 1 point, for each "no" or "can't tell" – 0 points. Results could possibly vary between 0 and 41. High results indicate greater learning difficulties.

Six subscales can be distinguished in the learning difficulties questionnaire. These subscales can indicate the academic area in which a student is facing the greatest difficulties: 1. Difficulties in mathematics. 2. Difficulties with use and comprehension of language. 3. Difficulties with reading proficiency. 4. Difficulties with writing, spelling and grammar (note- reading and writing difficulties can be counted as being under a single subscale). 5. Low academic performance. 6. Tick or motor disorders.

III. RESULTS OF RESEARCH

In schools of general secondary education internal, external learning motivation as well as learning amotivation levels

changed after the introduction of integrative teaching methodology indicating a significant increase in learning motivation. In the 3-4 grade sample of the schools of general secondary education the results of learning motivation questionnaire had significantly changed in all three learning motivation subscales (see Table I). The level of amotivation had significantly decreased (before the beginning of school year $M=22,94$ Test I and after the completion of school year $M=7,10$ Test II). External learning motivation showed an increase of 21,59 points and internal learning motivation increased by a mean of 17,16 points ($p<0,001$).

Comparison of the results between Tests I and II for 5-7 grade samples of schools of general secondary education showed a statistically significant decrease of learning amotivation (Test I, $M = 22,20$; Test II, $M = 9,25$), external learning motivation levels showed an average increase of 20,11 points and internal learning motivation levels increased by 9,35 points ($p < 0,001$) (see Table II).

TABLE I
COMPARISON OF THE RESULTS OF TEST I AND TEST II IN GENERAL
SECONDARY EDUCATION SCHOOL 3-4 GRADE STUDENT SAMPLE

Parameter	M	SD	r	Difference	t
<i>Ex.l.m. I</i>	4,68	4,87	-0,28**	-21,59	-32,16***
<i>Ex.l.m. II</i>	26,27	5,03			
<i>In.l.m. I</i>	6,81	6,11	-0,36***	-17,16	-18,73***
<i>In.l.m. II</i>	23,97	6,60			
<i>Amot. I</i>	22,94	7,58	-0,40***	15,84	13,70***
<i>Amot. II</i>	7,10	8,60			

Legend in this table and further: *Ex.l.m. I* - External learning motivation I. *Ex.l.m. II* - External learning motivation II. *In.l.m. I* - Internal learning motivation I. *In.l.m. II* - Internal learning motivation II. *Amot. I* - Amotivation I. *Amot. II* - Amotivation II.

* $p < 0,05$, ** $p < 0,01$, *** $p < 0,001$; M – arithmetic mean, SD – standard deviation, r – Pearson's Correlation coefficient, t – Result of Student's dependent t-test for paired samples.

TABLE II
COMPARISON OF THE RESULTS OF TEST I AND TEST II IN GENERAL
SECONDARY EDUCATION SCHOOL 5-7 GRADE STUDENT SAMPLE

Parameter	M	SD	r	Difference	t
<i>Ex.l.m. I</i>	4,68	4,86	-0,35***	-20,11	-35,02***
<i>Ex.l.m. II</i>	24,79	4,91			
<i>In.l.m. I</i>	9,54	5,28	-0,36***	-9,35	-14,44***
<i>In.l.m. II</i>	18,89	5,45			
<i>Amot. I</i>	22,20	6,86	-0,49***	12,95	14,21***
<i>Amot. II</i>	9,25	7,79			

In general secondary education schools 8-12 grade groups show a significant increase in parameters of external learning motivation (mean difference between Tests I and II – 18,30 points) and internal learning motivation (difference 6,67), levels of amotivation decreased by more than a half (Test I, $M = 22,72$; Test II, $M = 8,38$) (see Table III). Comparative analysis of the results is statistically significant for all motivation parameters ($p < 0,001$).

In 3-4 grade student sample of other schools amotivation levels significantly decreased (Test I, $M = 20,24$; Test II,

M = 13,45) ($p < 0,05$) (see Table IV). Both internal and external motivation levels increased (statistically significant, $p < 0,001$).

TABLE III

COMPARISON OF THE RESULTS OF TEST I AND TEST II IN GENERAL SECONDARY EDUCATION SCHOOL 8-12 GRADE STUDENT SAMPLE

Parameter	M	SD	r	Difference	t
<i>Ex.l.m. I</i>	5,51	4,53	-0,30***	-18,30	-
<i>Ex.l.m. II</i>	23,81	5,05			28,02***
<i>In.l.m. I</i>	11,65	5,48	-0,42***	-6,67	-7,90***
<i>In.l.m. II</i>	18,32	5,96			
<i>Amot. I</i>	22,72	6,12	-0,37***	14,34	15,50***
<i>Amot. II</i>	8,38	6,91			

TABLE IV

COMPARISON OF THE RESULTS OF TEST I AND TEST II IN OTHER SCHOOL 3-4 GRADE STUDENT SAMPLE

Parameter	M	SD	r	Difference	t
<i>Ex.l.m. I</i>	2,74	4,27	0,05	-23,56	-
<i>Ex.l.m. II</i>	26,30	5,11			18,83***
<i>In.l.m. I</i>	5,15	5,63	-0,33	-20,15	-
<i>In.l.m. II</i>	25,31	4,66			12,19***
<i>Amot. I</i>	20,24	8,06	-0,49**	6,79	2,63*
<i>Amot. II</i>	13,45	7,78			

5-7 grade group from other schools also showed a significant decrease of amotivation (Test I, M = 21,57; Test II, M = 10,00) ($p < 0,001$) (see Table V). Internal and external learning motivation levels showed a significant increase as well.

TABLE V

COMPARISON OF THE RESULTS OF TEST I AND TEST II IN OTHER SCHOOL 5-7 GRADE STUDENT SAMPLE

Parameter	M	SD	r	Difference	t
<i>Ex.l.m. I</i>	3,91	4,57	-0,03	-21,48	-
<i>Ex.l.m. II</i>	25,39	6,66			21,76***
<i>In.l.m. I</i>	8,03	5,17	-0,23	-11,85	-
<i>In.l.m. II</i>	19,88	7,16			10,02***
<i>Amot. I</i>	21,57	7,18	-0,38**	11,57	7,53***
<i>Amot. II</i>	10,00	8,04			

In the 8-12 grade group a significant decrease in levels of amotivation (Test I, M = 20,91; test II, M = 11,67) after the introduction of the integrative teaching methodology was observed, alongside a significant increase of the levels of both internal ($p < 0,01$) and external ($p < 0,001$) learning motivation was ascertained (see Table VI).

Overall other schools showed a significant change in the attitude toward learning and positive switch in favour of greater learning motivation.

TABLE VI

COMPARISON OF THE RESULTS OF TEST I AND TEST II IN OTHER SCHOOL 8-12 GRADE STUDENT SAMPLE

Parameter	M	SD	r	Difference	t
<i>Ex.l.m. I</i>	5,10	4,70	-0,46*	-18,60	-7,59***
<i>Ex.l.m. II</i>	23,70	7,95			
<i>In.l.m. I</i>	10,57	5,97	-0,17	-7,43	-3,05**
<i>In.l.m. II</i>	18,00	8,46			
<i>Amot. I</i>	20,91	9,60	-0,83***	9,24	2,42*
<i>Amot. II</i>	11,67	9,13			

Using comparative analysis of the teacher evaluation it was determined which learning aspects had shown the greatest improvement. In the 3-4 grade student sample of schools of general secondary education following aspects showed a significant improvement: overall mean results for the group had decreased in the general learning difficulty parameter (difference 2,48 points, $p < 0,001$), difficulties with learning mathematics ($p < 0,01$), difficulties with the use and understanding of language ($p < 0,001$), difficulties with writing and spelling ($p < 0,05$), motor problems ($p < 0,001$) (See Table VII). No changes were observed in levels of reading and writing fluency and unsatisfactory academic performance.

TABLE VII

COMPARISON OF THE RESULTS OF TESTS I AND II OF LEARNING DIFFICULTY QUESTIONNAIRE FOR THE 3-4 GRADE STUDENT SAMPLE OF THE SCHOOLS OF GENERAL SECONDARY EDUCATION

Parameter	M	SD	r	Difference	t
<i>Le.d. I</i>	12,75	9,37	0,74***	2,48	4,47***
<i>Le.d. II</i>	10,27	9,23			
<i>D.m. I</i>	3,55	2,52	0,67***	0,54	3,08**
<i>D.m. II</i>	3,01	2,72			
<i>D.u.l. I</i>	3,54	3,22	0,68***	1,05	5,12***
<i>D.u.l. II</i>	2,49	3,00			
<i>D.r.f. I</i>	0,93	1,20	0,56***	0,10	1,10
<i>D.r.f. II</i>	0,83	1,19			
<i>D.w.s. I</i>	2,41	2,26	0,70***	0,30	2,01*
<i>D.w.s. II</i>	2,11	2,25			
<i>U.a.p. I</i>	0,89	1,35	0,35***	0,02	0,12
<i>U.a.p. II</i>	0,87	2,17			
<i>M.d. I</i>	0,91	1,30	0,58***	0,32	3,56***
<i>M.d. II</i>	0,59	1,08			
<i>P.r.w.p. I</i>	3,34	3,04	0,68***	0,39	1,94
<i>P.r.w.p. II</i>	2,95	3,13			

Legend in this table and further: *Le.d. I* - Learning difficulties I. *Le.d. II* - Learning difficulties II. *D.m. I* - Difficulties with mathematics I. *D.m. II* - Difficulties with mathematics II. *D.u.l. I* - Difficulties with the use and understanding of language I. *D.u.l. II* - Difficulties with the use and understanding of language II. *D.r.f. I* - Difficulties with reading fluency I. *D.r.f. II* - Difficulties with reading fluency II. *D.w.s. I* - Difficulties with writing and spelling I. *D.w.s. II* - Difficulties with writing and spelling II. *U.a.p. I* - Unsatisfactory academic performance I. *U.a.p. II* - Unsatisfactory academic performance II. *M.d. I* - Motor disorders I. *M.d. II* - Motor disorders II. *P.r.w.p. I* - Problems with reading and writing proficiency I. *P.r.w.p. II* - Problems with reading and writing proficiency II.

* $p < 0,05$, ** $p < 0,01$, *** $p < 0,001$; M – arithmetic mean, SD – standard deviation, r – Pearson's Correlation coefficient, t – Result of Student's dependent t-test for paired samples.

In the 5-8 grade sample from schools of general secondary education, statistically significant improvements after the introduction of the integrative teaching methodology were found in all aspects of learning difficulties (see Table VII). Overall mean difference between the tests was 3,37 points ($p < 0,001$).

TABLE VIII

COMPARISON OF THE RESULTS OF TESTS I AND II OF LEARNING DIFFICULTY QUESTIONNAIRE FOR THE 5-7 GRADE STUDENT SAMPLE OF THE SCHOOLS OF GENERAL SECONDARY EDUCATION

Parameter	M	SD	r	Difference	t
<i>Le.d. I</i>	10,09	9,35	0,49***	3,37	6,08***
<i>Le.d. II</i>	6,72	8,61			
<i>D.m. I</i>	2,25	2,52	0,48***	0,67	4,34***
<i>D.m. II</i>	1,58	2,41			
<i>D.u.l. I</i>	2,54	3,09	0,49***	0,88	4,93***
<i>D.u.l. II</i>	1,66	2,60			
<i>D.r.f. I</i>	0,62	0,98	0,44***	0,15	2,47*
<i>D.r.f. II</i>	0,47	0,89			
<i>D.w.s. I</i>	2,40	2,06	0,41***	0,77	5,81***
<i>D.w.s. II</i>	1,63	1,89			
<i>U.a.p. I</i>	1,13	1,38	0,41***	0,41	4,64***
<i>U.a.p. II</i>	0,72	1,23			
<i>M.d. I</i>	0,66	0,99	0,31***	0,33	5,06***
<i>M.d. II</i>	0,33	0,79			
<i>P.r.w.p. I</i>	3,02	2,82	0,45***	0,92	5,23***
<i>P.r.w.p. II</i>	2,10	2,58			

In the 8-12 grade sample of the schools of general secondary education a statistically significant difference between the tests was found in the following aspects: problems with reading and writing proficiency (mean decrease of 0,59 points, $p < 0,001$), difficulties with writing and spelling (mean decrease of 0,54 points, $p < 0,001$) and difficulties with the use and understanding of language (mean decrease of 0,38 points, $p < 0,05$) (see Table IX). Statistically significant changes were found in the overall measure of learning difficulties (mean decrease of 1,18 points, $p < 0,05$).

Some statistically insignificant changes were found in the 3-4 grade sample from other schools (see Table X).

Comparative analysis of the results acquired from the 5-7 grade sample of other schools showed a statistically significant change in the following aspects: overall level of learning difficulties (difference of 6,33 points, $p < 0,001$), difficulties with mathematics (difference of 1,91 point, $p < 0,001$), difficulties with the use and understanding of language (difference of 2,28 points, $p < 0,001$), difficulties with reading fluency (difference of 0,32 points, $p < 0,05$), difficulties with writing and spelling (difference of 1,37 points, $p < 0,001$), problems with reading and writing proficiency (difference of 1,70 points, $p < 0,001$) (see Table XI).

TABLE IX

COMPARISON OF THE RESULTS OF TESTS I AND II OF LEARNING DIFFICULTY QUESTIONNAIRE FOR THE 8-12 GRADE STUDENT SAMPLE OF THE SCHOOLS OF GENERAL SECONDARY EDUCATION

Parameter	M	SD	r	Difference	t
<i>Le.d. I</i>	8,23	7,07	0,58***	1,18	2,45*
<i>Le.d. II</i>	7,05	6,92			
<i>D.m. I</i>	2,09	2,38	0,43***	-0,07	-0,37
<i>D.m. II</i>	2,15	2,21			
<i>D.u.l. I</i>	1,66	2,24	0,52***	0,38	2,37*
<i>D.u.l. II</i>	1,28	2,09			
<i>D.r.f. I</i>	0,40	0,79	0,58***	0,05	1,08
<i>D.r.f. II</i>	0,35	0,73			
<i>D.w.s. I</i>	2,19	1,57	0,38***	0,54	4,18***
<i>D.w.s. II</i>	1,65	1,46			
<i>U.a.p. I</i>	1,27	1,44	0,39***	0,04	0,33
<i>U.a.p. II</i>	1,23	1,43			
<i>M.d. I</i>	0,31	0,72	0,43***	0,07	1,20
<i>M.d. II</i>	0,24	0,68			
<i>P.r.w.p. I</i>	2,59	2,14	0,46***	0,59	3,67***
<i>P.r.w.p. II</i>	2,00	1,98			

TABLE X

COMPARISON OF THE RESULTS OF TESTS I AND II OF LEARNING DIFFICULTY QUESTIONNAIRE FOR THE 3-4 GRADE STUDENT SAMPLE OF OTHER SCHOOLS

Parameter	M	SD	r	Difference	t
<i>Le.d. I</i>	15,50	8,39	0,41*	0,78	0,45
<i>Le.d. II</i>	14,72	9,61			
<i>D.m. I</i>	3,47	2,81	0,48**	-0,22	-0,45
<i>D.m. II</i>	3,69	2,53			
<i>D.u.l. I</i>	4,34	2,99	0,29	0,06	0,09
<i>D.u.l. II</i>	4,28	3,48			
<i>D.r.f. I</i>	1,13	1,13	-0,15	0,00	0,00
<i>D.r.f. II</i>	1,13	1,26			
<i>D.w.s. I</i>	4,09	1,92	0,02	0,19	0,35
<i>D.w.s. II</i>	3,91	2,35			
<i>U.a.p. I</i>	0,59	1,13	0,41*	0,37	1,98
<i>U.a.p. II</i>	0,22	,75			
<i>M.d. I</i>	1,13	1,31	0,17	0,16	0,52
<i>M.d. II</i>	0,97	1,31			
<i>P.r.w.p. I</i>	5,22	2,73	-0,04	0,19	0,24
<i>P.r.w.p. II</i>	5,03	3,27			

TABLE XI

COMPARISON OF THE RESULTS OF TESTS I AND II OF LEARNING DIFFICULTY QUESTIONNAIRE FOR THE 5-7 GRADE STUDENT SAMPLE OF OTHER SCHOOLS

Parameter	M	SD	r	Difference	t
<i>Le.d. I</i>	12,65	8,99	0,29**	6,33	5,94***
<i>Le.d. II</i>	6,32	8,27			
<i>D.m. I</i>	3,53	2,81	0,27**	1,91	5,78***
<i>D.m. II</i>	1,62	2,49			
<i>D.u.l. I</i>	3,68	3,43	0,32**	2,28	6,11***
<i>D.u.l. II</i>	1,40	2,67			
<i>D.r.f. I</i>	0,91	1,21	0,35***	0,32	2,55*
<i>D.r.f. II</i>	0,59	0,98			
<i>D.w.s. I</i>	2,88	2,11	0,34**	1,37	5,57***
<i>D.w.s. II</i>	1,51	2,05			
<i>U.a.p. I</i>	0,73	1,39	0,03	0,26	1,46
<i>U.a.p. II</i>	0,47	1,12			
<i>M.d. I</i>	0,38	0,89	0,20*	-0,10	-0,80
<i>M.d. II</i>	0,48	0,94			
<i>P.r.w.p. I</i>	3,80	3,02	0,36***	1,70	4,96***
<i>P.r.w.p. II</i>	2,10	2,88			

In the 8-12 grade sample of other schools statistically significant improvements after the introduction of the integrative teaching methodology were found in all aspects but one – difficulties with the use and understanding of language. The overall mean difference for learning difficulties is 5,97 points ($p < 0,001$) (see Table XII).

TABLE XII

COMPARISON OF THE RESULTS OF TESTS I AND II OF LEARNING DIFFICULTY QUESTIONNAIRE FOR THE 5-7 GRADE STUDENT SAMPLE OF OTHER SCHOOLS

Parameter	M	SD	r	Difference	t
<i>Le.d. I</i>	14,17	8,42	0,39*	5,97	3,19**
<i>Le.d. II</i>	8,20	10,03			
<i>D.m. I</i>	3,20	2,38	0,42*	1,97	4,27***
<i>D.m. II</i>	1,23	2,31			
<i>D.u.l. I</i>	4,80	3,24	0,17	1,20	1,06
<i>D.u.l. II</i>	3,60	5,82			
<i>D.r.f. I</i>	1,03	1,16	0,36	0,50	2,19*
<i>D.r.f. II</i>	0,53	1,04			
<i>D.w.s. I</i>	3,50	1,93	0,20	1,63	3,85**
<i>D.w.s. II</i>	1,87	1,74			
<i>U.a.p. I</i>	0,20	0,81	0,68***	-0,37	-2,08*
<i>U.a.p. II</i>	0,57	1,30			
<i>M.d. I</i>	0,73	1,20	0,42*	0,46	2,25*
<i>M.d. II</i>	0,27	0,83			
<i>P.r.w.p. I</i>	4,53	2,67	0,28	2,13	3,71**
<i>P.r.w.p. II</i>	2,40	2,57			

IV. CONCLUSION

The introduction of the integrative teaching methodology in the schools of the general secondary education as well as in the other schools has significantly increased the internal and external learning motivation of the different grade students and reduced the amotivation to study.

In the schools of general secondary education the introduction of the integrative teaching methodology has proved to improve the learning and reduce most of the learning difficulties. In other schools 3-4 grade students showed a somewhat smaller decrease in the levels of learning difficulties, but 5-7 and 8-12 grade student sample showed a statistically significant change in overall levels of learning difficulties as well as some of the more particular aspects of the problem.

It can be concluded that students of general secondary education that were participating in the project found it easier to learn how to read, write and overcame the difficulties of spelling, grammar and mathematics. Integrative teaching methodology has proven to be successful as students generally performed overall better academically after being taught by this methodology. Students of other schools show similar results, apart from the 3-4 grade sample, where results were similar between both tests. The development and consolidation of a positive self-assessment has the same effects as training of certain skills and support and help measures.

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