



Teacher Education Programme on
Early Numeracy and Literacy
in the Former Yugoslav Republic of
Macedonia
Monitoring Note 2

1. INTRODUCTION:

Since 2008, the Ministry of Education and Science (MoES) with the support of UNICEF has been implementing the Teacher Education Programme on Early Numeracy and Literacy. The Programme introduces effective approaches that help teachers acquire knowledge and skills in early numeracy and literacy. Priority is given to teachers in the first cycle of primary education (grades 1-3)¹. The programme has the following aims:

- To deepen teacher understanding of quality teacher instruction in numeracy and literacy;
- To provide teachers with opportunities to acquire knowledge and skills for implementation of quality mathematics instruction and quality literacy instruction;
- To establish effective and sustainable approaches to teacher professional development;
- To improve student outcomes in early numeracy and literacy;
- To improve student results in future international assessments².

The Ministry of Education and Science (MoES) has the main responsibility for the Programme, and the Bureau for Education Development (BED) which by law is responsible for in-service teacher training, curriculum development and teacher support, is the leading institution.

The Programme is part of the Cooperation Agreement between the Government of the former Yugoslav Republic of Macedonia and UNICEF (2010-2015). The rationale for the Programme is the declining quality of education in the country and the lack of adequate support for teachers- identified as one of the key bottlenecks in the realization of the children's right to education³.

The Macedonian Centre for Civic Education (MCCE) is hired by UNICEF to provide logistic and expert support, specifically for: 1) conducting baseline studies as part of both numeracy and literacy components of the programme; 2) dissemination of teacher training in schools and certification of national trainers and teachers; and 3) providing support for the functioning of the regional learning (mentoring) teams.

The implementation of the programme started in the school year of 2009/2010 in 34 primary schools in the numeracy component, and in the school year of 2010/2011 in 28 primary schools in the literacy component (Phase One schools). By May 2014, the numeracy programme was disseminated to all (350) primary schools in the country, and the literacy programme to 149 primary schools. Although introduced as a pilot initiative, the programme is now officially recognized in the Government Programme for Education. Based on the experiences from implementation, in 2014 the MoES and BED revised the curricula in mathematics for the first cycle of primary education⁴ with the support of Cambridge International Examination Centre Programme. The new curricula is officially introduced in all primary schools in the country as of the school year 2014/2015.

¹ The Macedonian primary education system has three education cycles : 1-3, 4-6 and 7-9 grades

² 2006 PIRLS rank 33rd out of 40 participating countries - only 2 % of 4th grade students reached the "advanced" benchmark, 15 % "high" benchmark, and 40 % "intermediate" level². 2003 TIMMS ranking 29 out of 38 countries -70% of eight grade students are reaching the minimum level. 2000 PISA ranked Macedonia as 38 out of 41 countries. The PISA results indicated that only 34.5 per cent of pupils who had completed or were about to complete primary education had not even achieved the first of five levels of proficiency, while an additional 28 per cent had only reached the first proficiency level..

³ UNICEF (2010). Situation Analysis of Children and Women. UNICEF Skopje

⁴ <http://bro.gov.mk/?q=mk/node/163>

<http://www.cie.org.uk/images/25127-cambridge-primary-maths-curriculum-framework.pdf>

As described in the System Note and Monitoring Note 1, the Programme included teacher training and teacher support. The strategies introduced in support of teachers follow the theory of change according to which teachers define their success in terms of their students' learning⁵:

- Teachers are provided with training opportunities⁶ to acquire new knowledge and skills and change teacher instruction;
- Focus is on the application of the newly acquired knowledge and skills as the key prerequisite for initiating the process of continuous improvement;
- Only when/if teachers see change in student learning and outcomes does this translate into change in their attitudes and beliefs.

During the first years of the programme implementation, in addition to training, teachers and schools were visited by BED advisors and national trainers. Each school was visited at least three times in the course of the one school year. The aims of the school visits were the following:

1. To monitor the implementation of the programme, the achievements and the challenges that the teachers and the schools are faced with, and
2. To provide schools and teachers with professional support for overcoming the challenges and continue progress.

The school visits conducted in 2011, 2012 and 2013 have contributed to the achievement of the programme aims, as reported⁷:

- Teachers have better understanding of approaches promoted with the numeracy and literacy teacher education programme; teacher instruction in numeracy, reading and writing has improved and most of the teachers are applying the basic principles, the strategies and the techniques learnt during the trainings;
- In most of the schools, teachers are applying techniques in a more creative way- more creative materials are developed, and the learning environment is enriched;
- Teachers demonstrate greater confidence in the application of the techniques, they believe that the new approaches make teaching easier, and they are motivated to apply them;
- In almost all the schools, there is increased student motivation and engagement can be observed and a number of schools reported higher student achievements;

⁵ Guskey (2002). *Professional Development and Teacher Change*. Teachers and Teaching: theory and practice, Vol. 8, No. 3/4, 2002
<http://physics.gmu.edu/~hgeller/TeacherWorkshop/Guskey2002.pdf>

⁶ Training was provided at several levels. First, all early grade teachers were provided with 48 hours training on early numeracy and literacy through a cascade model: national trainers (experienced teachers) were trained by international trainers, then national trainers trained regional trainers (teachers) and these trained school trainers (teachers) who then trained all teachers in a school. BED advisors provided monitoring and support at all levels. Second, as part of RLT, training was provided to teachers as RLT members on certain topics, such use of fidelity tool, action research and mentoring.

⁷ MCCE project reports 2013 "Findings from the in-school support visits to the schools".

- Teachers in all schools reported that they welcome school support visits as they are keen to receive feedback about the quality of their work.

1.1. EFFECTIVENESS OF THE EARLY NUMERACY AND LITERACY PROGRAMME

As already described in ILE Monitoring Note 1, baseline studies in both numeracy (2009) and literacy (2010) were conducted before teachers were trained and started to apply new knowledge and skills, and progress assessments were conducted following a period of three year implementation of the programme (numeracy, 2012 and literacy, 2013)⁸. The studies were designed to measure the situation before and after three years of implementation in terms of changes in the organization of the school learning environment, teacher attitudes, teacher expectations and teacher support, and the influence of these on the student achievements. The studies confirmed that in the project schools:

- The average results of students in numeracy in 2012 are 22 percentage points higher than the results measured in 2009;
- The average results of students in the literacy in 2013 are higher than the results measured in 2009, and statistically significant improvement of 6 percentage points is recorded in the domain of Reading, but there is limited or no improvement in Writing.

One of the key recommendations from both studies, as well as from teacher feedback from the school support visits, is the need to provide continuous, long-term and strengthened support to teachers which include support by the responsible institutions, in this case the BED advisors and the national trainers. The focus of such support should be providing feedback to teachers and support through facilitating exchange and sharing of good practices and materials among teachers. Such support was pointed out as key for overcoming the pedagogical ambivalence and increasing teacher self-confidence for application of the new approaches and experimentation with diverse methods, for strengthening teacher pedagogical and expert knowledge and skills, especially in relation to student assessment, and taking responsibility for student achievements.

2. REGIONAL LEARNING TEAMS – ESTABLISHMENT AND TRAININGS

In order to respond to teachers' needs for further support and learning, in the period from September 2013 until May 2014 the programme focused on the establishment and functioning of teacher professional development mechanisms: 1) upgrade and revision of the existing institutional mechanisms-BED; and 2) introduction of innovative approaches to teacher professional development- regional learning teams.

⁸ Mickovska G., Aleksova A., Cheslarov M., Raleva A., (2009), *Thinking mathematics in lower grades – Baseline study report*, UNICEF, Skopje. http://www.unicef.org/tfymacedonia/UNICEF_Math_Report_2009_-ANG_za_na_web_so_korici.pdf

Aleksova A., Mickovska G., Cheslarov M., (2012), *Thinking mathematics in lower grades –mid-term evaluation report*, UNICEF, Skopje. http://www.unicef.org/tfymacedonia/UNICEF_Math_Report_2012_ANG_za_na_nweb_so_korici.pdf

Mickovska G., Aleksova A., Naceva B., Raleva A., Cheslarov M., (2010), *Reading literacy in lower grades – Baseline study report*, UNICEF, Skopje.

http://www.unicef.org/tfymacedonia/JAZICNA_PISMENOST_Lan_Report_2010_ANG_za_na_web.pdf

Aleksova A., Mickovska G., Cheslarov M., (2013), *Reading literacy in lower grades mid-term evaluation report*, UNICEF, Skopje.

http://www.unicef.org/tfymacedonia/JAZICNA_PISMENOST_Lan_Report_2013_ANG_za_na_web.pdf

The rationale for introducing regional learning teams was the limited financial and human resources of the BED for supporting all primary schools which as envisaged that BED advisors visiting several times in the course of the school year every primary school in the country. As the number of schools included in the programme was increasing, the BED capacity to provide such support was stretched. . It was therefore decided to introduce innovative mechanism *regional learning teams (RLT)* for schools that were included in the programme in the first phase. .

The regional learning teams are communities of teachers and are established with the aim to provide opportunities for sharing experiences and learning from practice among the teachers at local level. Selected teachers from several schools in the region meet regularly, the activities are planned and organized in advance, and they are mainly directed to exchange of experiences, ideas and materials related to student learning and student achievements. The RLT members use newly-acquired knowledge from facilitators and teachers from other schools, share these with the teachers from their own school and have the obligation to provide in school support for implementation.⁹

The specific aim of the RLT is to strengthen the quality of application of the early numeracy and literacy programmes in schools by strengthening the capacities of teachers for monitoring the programme application and the programme effects. Teachers are trained to use specific instruments to collect information, to analyze the situation at school level, and based on evidence to provide adequate mentor support to teachers for improving the quality of the application.

The main instruments used by the RLTs for monitoring are the fidelity tools for numeracy, reading and writing¹⁰. These instruments facilitate the collection of evidence from classroom as a basis for giving specific support to teachers in improving their practice. The fidelity tools are not tools for evaluating teachers, but are rather used to assess what teachers do well and most importantly to identify the areas for further support.

RLT Members include two representatives from each school in the region and these include teachers-national trainers, teachers- regional trainers, teacher-school trainers and/or one member of school expert staff (pedagogue and psychologists). The work of the learning teams is facilitated by BED advisors. Additional members include school principals, University Professors and associates.

It is expected that results from the support provided by the RLTs are:

- Established mechanism for teacher support that address teachers' specific needs for learning;
- Increased number of teachers at school level with capacity for quality application;
- Improved quality of teachers' portfolios and their adequate use;
- Increased number of teachers acquiring certificates;
- Increased number of good practices and increased sharing and exchange among teachers within one school, and among teachers from other schools and the wider professional community;
- Improved student learning results.

⁹ MCCE Programme documents *Setting up and conducting Regional Learning Teams for the early Numeracy and Literacy Programme*

¹⁰ Fidelity tools are given as appendix with ILE Monitoring Note 1.

In order to check the efficiency and the effectiveness of the RLTs, they were initially piloted in selected regions, such as Skopje, Prilep, Bitola and Struga and for both languages of instruction: Macedonian and Albanian¹¹. In total 6 teams were formed, 3 for on early numeracy (2 teams for schools in Macedonian language of instruction and 1 team for schools in Albanian Language of instruction) and 3 teams on early literacy (2 teams for schools in Macedonian language of instruction and 1 team for schools in Albanian language instruction) and in total, 44 primary schools were included and 6 BED advisors as coordinators.

There were three levels of support envisaged. The first level, the BED advisors as facilitators of RLTs received training and guidance for coordinating and facilitating RLTs and selecting indicators for monitoring. The second level is the transfer of knowledge and skills from BED advisors as RLT facilitators to the RLT members or teachers for their role of mentoring and supporting other teachers at school level. And the third level, the RLT members- the teachers implementing activities, such as observing and monitoring the work of other colleagues-teachers, gathering data by using the fidelity tool, giving feed-back and support to teachers, organizing school training and workshops, etc.

Guidance and instructions were developed for the BED advisor- RLT facilitator, and RLT members or teachers. Both teachers and BED advisors were provided training in the following areas:

- *Use of fidelity tools on numeracy, reading and writing* to strengthen their knowledge and skills for monitoring, evaluating and providing support based on evidence;
- *Mentor support programmes on early numeracy and literacy*, to strengthen their facilitator's skills and mentoring skills;
- *Development and evaluation of good practices*, to improve their skills for identifying good practices based on criteria for evaluation of good practices; and

3. REGIONAL LEARNING TEAMS –EFFECTIVENESS AND EFFICIENCY

3.1 PROGRESS OF ACTIVITIES

The table below with key activities, indicators, and means for verification was presented in Monitoring Note1¹². The table is amended with quantitative data about achievements in two periods: November 2013 before the start of the RLT meetings, and June 2014 – after finalization of the fourth RLT meeting.

Table 1: Monitoring and evaluation quantitative data

<i>Upgrade and revision of the existing institutional mechanisms-BED (national level)</i>				
Activity	Indicator	Means of verification	Achievements by November 2013	Achievements by June 2014
1.BED monitoring school visits based on use of fidelity tools	# of schools visited # teachers supported # of reports issued Quality of reports	BED advisors school monitoring reports Teacher portfolios	-260 schools visited and reports prepared -659 teachers monitored and supported - 460 teachers portfolio reviewed	

¹¹ There are four official languages of instruction in the former Yugoslav Republic of Macedonia: Macedonian, Albanian, Serbian and Turkish. As per programme data, some 31% of teachers in lower grade of primary education teach in Albanian language of instruction

¹² Monitoring Note 1, pg. 11

2. School plans for teacher support developed based on feedback by BED advisors	# of additional interventions implemented at school level	School plans for teacher support BED advisors school monitoring reports		school plans for support of 289 teachers realized by Oct 2013
3. BED advisors' reports at national level	Summary report at national level	BED reports		- 2 summary reports at national level - 30 BED advisors reports at regional level
Regional Learning Teams in selected regions¹³				
1. RLT members training on fidelity tool and mentoring	# of trained RLT members on how to use fidelity tool and mentoring	Meeting and workshop reports	-1 Manual for RLT work prepared -6 RLTs established -1 Meeting with RLT coordinators organized - 6 BED advisors trained on facilitation -6 RLT meetings/workshops realized -88 RLT members trained on use of fidelity tool and mentoring	-18 RLT meetings/workshops realized -91 RLT members trained
2. RLT members school visits	# of schools visits # reports from schools visits	School monitoring reports by RLT members	-192 classes observed -34 school reports issued - 6 regional reports issued	- 468 classes observed ¹⁴ - 922 teachers supported -134 school reports and presentations prepared - 18 regional reports prepared
3. Findings from RTL school visits discussions and recommendations for follow-up improvement	Summary reports with issues for follow-up identified	RLT members reports		18 presentations on findings and recommendations for follow-up support visits organized and agreed ¹⁵
4. RLT follow-up support to schools based on findings- the identified need for additional training	# of training identified and materials for training produced			In average 4 workshops per school were organized (in total 176) and at least 3 different training materials and activities

¹³ Activities under 1,2,3,4 and 5 represent steps of a cycle. Once completed the cycle is repeated

Activity 6 is conducted once a year- at the end of the school year

Activity 8 is supported both at national level by BED advisors and at regional level by RLTs. The difference is that at regional level RLTs are expected to provide more frequent and intense support and resulting in more examples of best practices

¹⁴ Findings from teachers monitoring: The indicators that were underrepresented in class observations

Language: Phonological awareness, Chronological ordering events in text and drawing conclusions, Interactive writing, Using double-note diary

Mathematics: Patterns in table 100, Students are developing story problems, Using manipulatives to illustrate the concept (simplification of the abstract level of the concept understanding), Students mutual assessment, Using and acceptance of different strategies in solving textual tasks, Solving simple problems.

¹⁵ During the second RLT meeting/workshop the activities and materials for teacher's follow-up visits were developed and discussed. These are related to materials in footnote 16

				per workshop were prepared
5. Training and support to schools in the region	# of schools provided with specific training and support			44 schools received specific training and support
6. Collecting and presenting evidence of impact)	# of schools providing evidence on improvement in teacher knowledge and students results Improvement in teachers attitudes Improvement in teacher knowledge Improvement in students results	RLT meeting reports Reports from focus group discussions with teachers Teacher portfolios Student records		-44 schools provided evidence -24 RLT meeting reports prepared -6 BED advisers reports prepared -6 reports from FGD with teachers prepared -63 answered questionnaires (e-research) -371 teachers portfolios reviewed and student records analysed
7. Teacher training on documenting good classroom practices	# of teachers trained # of good practices developed	Workshop reports BED reports, RLT coordinator reports	-training materials developed -2 workshops conducted -110 teachers trained on development of good practices	
8. Training of BED advisors and teachers as RLT members on review and assessment of good practices	# of BED advisors trained Developed criteria for good practices	Workshop reports Evaluation reports Criteria published on BED website	-training materials developed -1 workshop conducted -50 BED advisors trained -criteria for good practices developed (not yet published)	-training materials developed -1 workshop conducted -60 teachers trained on development of good practices
9. Review, assessment and publishing of good practices on BED website	# of selected good practices that meet the criteria # of good practices published on BED website	RLT Working group meetings reports		Announcement for developing good practices by teachers one early numeracy and literacy published ¹⁶

3.2. EFFECTIVENESS OF ACTIVITIES

The qualitative data about the effects of the activities undertaken by the RLTs was gathered through:

- A detailed analyses of the reports from the RLTs meetings prepared by BED advisors;
- An e-survey with teachers - members of the RLT; and Focus groups discussion with teachers from 6 schools participating in the work of the six RLT teams.

¹⁶ Announcement *Teachers competition: Numeracy & Literacy best practices contains*: 1) Call for the competition, 2) Good lesson practice file description, 3) Lesson description form, 4) Good video file description, 5) Criteria for Numeracy & Literacy good practices

3.2.1. Findings from the reports of the BED advisors

In the period of October 2013 – May 2014 each of the six RLTs had at least four meetings, 4-6 hours long. Each of the four meetings was attended by about 90 teachers. The focus of the meetings was on the following:

First meeting– mentoring, discussion and application of the tools for classroom observation.

Second meeting – providing feedback to teachers based on evidence from observation, discussion about areas and indicators assessed as unsatisfactory, models and ways for providing support for improving the situation.

Third meeting – methodology and principles of providing support through planning and realization of trainings, workshops, presentations on effects at classroom and school level from the support provided by the RLTs, selection of new indicators related to the specific support provided.

Fourth meeting – school presentations with evidence on effectiveness, such as videos, photographs, working materials, teachers’ portfolios, related to the baseline situation or before RLT activities, lessons learned and comments.

In these meetings, the BED advisor as facilitator presented summary of activities carried out in the schools in the period between the meetings. In total 700 teaching classes were observed and 984 teachers received support in the realization of the programs *early numeracy and literacy*.

The key achievements reported from this support include:

- *Improved learning environment*- teachers are developing a lot of learning materials, gathering and presenting works from students, creating numeracy and literacy corners in the classrooms;
- *Improved student engagement* - students are active, interested, communicative, engaged in problem solving and explain and justify their thinking;
- *Improved student learning*- students are acquiring difficult contents that they were struggling with in the past (e.g. multiplying in grade 3 by using models for multiplication and division, sequencing of events, or basic writing);
- *Improved teacher cooperation*- teachers have intensified the exchange of materials related to teacher instruction and there are more frequent meetings of the professional teacher bodies; organization of open classes for other teachers in the school, and discussions about improving teacher instruction and student learning;
- *Increased support by the school management*- school principal and expert school staff(pedagogues and psychologists) are increasingly supporting innovative approaches in teaching;
- *Increased application of the knowledge* acquired through the programme on early literacy and numeracy and application of these techniques and principles across other subjects.
- *Increased opportunities for teacher professional development at school level*- increased interest for organizing trainings and workshops, conducting action research on the use of techniques and principles and effects on student learning.

At the last (fourth) meeting of the RLT, the BED advisors report that they were requested to continue with this model of support as the teachers felt very effective in the support they are giving to colleagues at school level. Four out of the six RLTs have already developed a workplan for the next school year 2014/2015.

3.2.2. Findings from the e-survey

The RLTs led by BED advisors as a mechanism for teacher professional development is aimed at strengthening teacher knowledge and skills as mentors in support to implementation of *early numeracy and literacy*. The fidelity tools help the collection of relevant information through direct class observation based on previously defined indicators. In the indicators in which the situation was found as unsatisfactory or as an area that requires further support, the RLT was used as a forum for teachers to discuss with teachers from other schools ways in which support for improvement could be provided. Monitoring teacher instruction, providing feedback and support to teachers was realized by the RLT members following the discussions in the meetings of the RLT. At school level, RLT members were expected to facilitate regular meetings with early grade teachers, the expert staff and the school principal and:

- To present the guidance and the plan of the activities of the RLT;
- To explain the fidelity tool for collecting data about the baseline and the progress;
- To develop plans and conduct classroom observations;
- To provide feedback and to present the findings/reports from the classroom observations;
- To plan and to organize activities in areas in which teachers needed further support.

The e-survey aimed to gather data from implementation of this support at school level (see Annex 1 for additional info)

Relevance of support

The question “*To what extent are the respondents pleased with the selection of the topics for training*” aims to give a general picture about the extent to which the RLTs were relevant to teachers’ needs for support. The topics elaborated at the four meetings were generally divided into three areas: mentoring, the use of fidelity tools in gathering evidence from classroom application, providing feedback and supporting teachers.

On a scale from very pleased to not pleased, all respondents expressed satisfaction with the topics elaborated during the RLTs meetings, half of the respondents were *very* pleased, and the remaining ones were *mainly* pleased (see Annex 2 Graph 1). There was no respondent who was only partially pleased or who was not pleased. In response to the requirement to state 3 topics they were most pleased with, more than two thirds of respondents stated:

- Presentation, explanation and discussion of examples of completed fidelity tools;
- Practice and application of fidelity tools based on video material from classrooms;
- Guidance for class observation by using the fidelity tool;

- Guidance for providing support to teachers for selection of techniques for teaching and student learning;
- Guidance for adapting techniques to teaching contents, student abilities and age.

It is important to mention that respondents always emphasized mentor support as one of the three most important topics or more specifically, guidance for providing mentor support to other teachers, the characteristics and skills of the teacher mentor, protocols for organization and realization of the activities with the teachers. This leads to the conclusion that future trainings that focus on expert and pedagogical knowledge should also include training for strengthening mentoring skills.

For the question – “*To what extent were they pleased with the activities, the discussions and the cooperation with teachers from other schools?*” 55 % of respondents said they were *very* pleased; 44 % of respondents mainly pleased; and only one respondent *partially* pleased.

Teachers responded that they the quality of support received was at the highest possible level and teachers in the school cooperated better. Some 95% of the RLT members reported that the exchange of experiences and examples of good practices from colleagues from other schools have helped them (*33% a lot and 62% mainly*) in selecting the ways and the models for the realization of the support that they have been providing in their schools.

Meetings, trainings and workshops

There were 10 questions evaluating the effects of the carried out activities at the school level. The responses confirmed that 90% of the school teams for *numeracy* and 55% of the school teams for *literacy* had more than six meetings; and 10% for numeracy and 45% for literacy had from three to six meetings. The teachers reported:

- All teachers, RLT members organized meetings with other teachers, school expert staff and school principals to present the fidelity tool as a tool to gather information about the situation against the indicators related to early numeracy and literacy programme;
- More than half of the teachers, RLT members organized follow-up meetings with the school teams of early grade teachers and experts service staff to develop a plan for class observations (79% respondents), to review the reports (69% respondents) and to provide feedback about the findings from class observations (50% respondents);
- One third of the RLT members based on the request from the colleagues organized bilateral meetings for providing more detailed feedback and reflect about the situation, and meetings during which they explained to colleagues the process for acquiring a certificate;
- A smaller number of respondents had meetings for providing guidance on developing teachers’ portfolios (22%), planning of school workshops and trainings (13%), developing an annual plan for using the techniques for reading and writing (13%), presenting and comparing the school findings related to observed indicators with the findings from all schools at municipal level (6%) and 3% of respondents from a school with the expert service conducted a survey to determine the application of the principles and the techniques of the literacy programme across other subjects.

In all the 44 schools, on average four workshops/trainings were organized, out of which three were related to a more efficient application of the techniques on early numeracy, reading and writing (76% of the total number of workshops/trainings). In six schools, video recordings of classes were used to observe and analyze the application of the programme techniques.

Below is a summary of reported trainings organized in schools, in the period October 2013 to May 2014:

Table 2: Trainings conducted at school level

Number of workshops/trainings	Numeracy	Literacy
More than four	23%	39%
Two to four	70%	39%
One	7%	22%

In *numeracy*, the topics which were most frequently covered included: mathematical patterns, explanation and justification of mathematical thinking; mathematical games and activities; from numbers, pictures and stories to textual problems; explanation/justification of own mathematical thinking; strategies for multiplication and most frequent mistakes of students in multiplication.

In *literacy*, the most frequently covered topics included: interactive writing, analysis of examples from initial writing, adaptation reading and writing techniques to student age and grade; asking factual and predictive questions, sequencing words, story network, stories through picture, insert table, diary with double notes, sequencing of events, steps in writing.

In a small number of schools, the work was focused on teacher cooperation for preparation of manipulatives and visual aids, planning instruction and developing a model for class preparation in line with the new *numeracy and literacy programme*, and against the requirements of the education inspection, realization of the model lessons by the school trainer and then discussion.

Development of materials

Some 33% of respondents in numeracy and 52% of the respondents in literacy reported engagement in materials development. Over half of the respondents reported development and sharing of class lessons (82%), working sheets related to the use of the programme techniques and student assessment (55%). About one fourth of the respondents reported presentations, and 19% of the respondents prepared video-recordings from lessons on the use of the specific technique as a way to encourage discussion among teachers. Less than 10% developed and shared manipulative aids, realized open classes for other colleagues, and shared manuals related to teacher instruction and student assessment.

Teachers used different channels for sharing and dissemination of materials, such as You Tube, slide-share, the school Facebook page, numeracy and literacy grade teachers Facebook page and some of them

provided links¹⁷; but also teacher portfolios, school team portfolios, and individual portfolios (see Annex 2 Graph 2).

Individual support to teachers for overcoming challenges in instruction

In the period from October 2013 to May 2014, 389 classes in mathematics and language using the techniques and the principles of the *early numeracy and literacy programme* were observed by using the fidelity tools, and as a follow-up, 335 teachers were supported. A majority of respondents or 93% stated that the areas in which teachers asked for support were related to the application and/or modification of the application of the new techniques across the different grades and teaching subjects (see Annex 2 Graph 3).

Almost one fourth of the respondents reported the need for support to teachers in the development of manipulatives and visual aids, and the development of instruments for student assessment.

There were also demands for support related to planning and preparation of teacher instruction (16%):

Less than 10% of the respondents asked for support for work with vulnerable students, with regards to the most effective principles and techniques and using technology.

In numeracy, the survey shows that the support has contributed to greater application of the new approaches especially in grades 2 and 3 and the least in grade 5, while in literacy, the greatest application of the new approaches was in grade 3, and the least in grade 1.

Support for teacher certification

Some 19% of respondents have reported support to teachers in the process of certification¹⁸, i.e. support for gathering evidence for the teacher portfolio.

As a result of this support, the number of certified teachers for numeracy has increased for 66%, and for literacy the increase was almost the same as for the previous period of implementation or 18 months. More specifically:

- In numeracy, in the period from March 2012 until October 2013 when the process of certification was introduced in the 22 schools included in the RLT, 57 teachers acquired the certificates. In the

¹⁷ <http://www.youtube.com/watch?v=lnUjNnLW2WQ>; <http://www.youtube.com/watch?v=pNizNwegrYc>; <http://www.youtube.com/watch?v=9Af8mLx05w8>; http://www.youtube.com/watch?v=gKWx_lmLYAk; <http://www.youtube.com/watch?v=fzPijaBxz6U>; <http://www.youtube.com/watch?v=F5Tg8RrUrUw>; <http://www.youtube.com/watch?v=hevBzDzr5vU>; <http://www.youtube.com/watch?v=gYV04q1YnDY>; <http://www.slideshare.net/BiljanaBCM/ss-31359937>.

¹⁸ The certification process is explained in ILE Monitoring Note 1, Annex B.

period from November 2013 until April 2014, or after RLT work was introduced 86 teachers received certificates.

- In literacy, in the period March 2012 until October 2013, in the 22 RLT schools 132 teachers received certificates, and in the period from November 2013 until April 2014 only 129 teachers received certificates.

Improvement was noted in the quality of the 372 teacher portfolios reviewed, both for certified and non-certified teachers. The respondents were asked in what way the teacher portfolios improved and the responses include the following:

- The largest percentage (62%) referred to the improvement in terms of the number and the diversity of the materials produced, including evidence from teacher instruction, which was rare in the past. Teachers developed a routine in collecting materials, such as teaching lists, visual aids, and manipulatives or their descriptions, photos from realized activities, photos from parts of activities, student work, assessment materials, and other.
- Some 19% of the responses were about completeness of quality planning of lessons which include materials used, teaching lists, instruments for student assessment, student work, reflection about the realized lesson, and in part of them an analysis of the effects.
- Some 17% of the respondents noted that the portfolios included examples from the application of the techniques from the *numeracy or literacy programme*.

Characteristic examples of support to teachers for overcoming challenges

It was expected that the RLT model of teacher support would be effective in helping teachers face and overcome the specific challenges in implementation. The RLT members were asked to describe one *characteristic example* of teacher support provided. The examples are mainly related to the work of teachers with students, but also related to overcoming resistance to change by other teacher-colleagues.

A lot of respondents have described *examples of overcoming the resistance of the teachers* about the principles and the techniques from the *early numeracy and literacy programme*.

3.2.3. Findings from focus group discussions

In order to get information from the teachers in the schools that were directly benefiting from the support of the RLTs, focus groups were organized with early grade teachers and expert service staff (pedagogues and psychologists) in six randomly selected schools from each of the six RLTs. In total, 59 teachers and seven expert staff participated. The findings are summarized below.

Teachers

Almost all teachers were visited during a class lesson by one or two teachers – members of the RLT and one representative from the expert service (pedagogue or psychologist). Prior to the visits, the teachers were informed about the aim of the visit and familiarized with the fidelity tools as instruments for observation and collecting data. All the visited teachers said that the class observation was followed by a discussion about the situation based on evidence.

The teacher impressions are very positive as they lacked such support in the past, especially support that is announced and is based on a previously prepared plan with a clear aim to receive feedback and support and instruments that they are familiar with. The most important aspect is receiving feedback after the visit. The teachers emphasized workshops, small trainings, presentations, and exchange of materials and bilateral meetings with colleagues as the most frequent forms of support. A lot of the teachers in the focus groups listed concrete challenges which they were facing in the implementation and expressed satisfaction with the support received:

“I think that this support has great effects. We now have somebody to ask for help. The BED advisor cannot manage to give support to all early grade teachers. The colleagues from the learning teams are positive mediators. We exchange opinions and that improves my professional capacity. We analyze the techniques in details and discuss about their effects. I thought that I knew some of the techniques, but I realized that it is necessary to go back, because the most essential thing is that they are applied gradually and correctly.”(teacher from Bitola)

School pedagogues and psychologists

The school pedagogues and psychologists also participated in the focus group discussions and were asked to give their view about the activities and the support provided by the RLT members. In general, they expressed satisfaction and positive opinion about the support.

“After RLT were established, there is great movement in the school. The teachers are eager to learn more about the application of the new techniques and not just get the certificate. The quality of the instruction is now raised at a higher level. With the support of the RLT members from our school the techniques are applied by all the teachers and their confidence has increased. The cooperation among teachers increased in general, and not only with the mentor-teachers. The resistance by some teachers is overcome.” (focus group in Bitola).

Feedback about the effects on students

The teachers and the expert service staff reported improvements in the student learning. Some of the following statements reflect on the effects of the support on the students.

“For primary grade students, ordering pictures is very interesting; it engages even the most passive students. There is a competitive spirit, and students are motivated to retell according to the pictures.” (teacher from Prilep).

“With the Asterisk on the story- technique, the students understand better the content of the story.”(teacher from Prilep).

“They write compositions. They pay attention to a powerful beginning and end. They are happy when on the wall with words, they are able to compose a nice sentence rich in descriptions.”(teacher from Skopje).

“By applying various (plays, stories, strategies) I am able to motivate the students and I stimulate them to explain and justify their mathematical thinking” (teacher from Struga).

“I began to use tasks from various magazines and other materials. These are very interesting for students and now much more than before, they like to do the tasks, although they are textual and more difficult.”(teacher from Bitola).

4. CONCLUSIONS:

The regional learning teams established and functioning in six regions in the country and involving in total 44 primary schools in both early numeracy and literacy have resulted in positive changes at all levels. More specifically the programme has contributed to:

- Improved quality of the teacher work with students;
- Increased number of teachers with quality portfolios and certificates;
- Overcome resistance to change by supporting and deepening teacher understanding and application of the techniques and the principles promoted with the new programme;
- Increased cooperation among teachers within a school and with teachers from other schools;
- Increased teacher confidence and openness of teachers to present and share their own practice and create examples of good practice available not only to their own schools, but also to the wider audience;
- Increased number of schools that have teachers with capacity to provide mentor support to other teachers in their own school.

On the basis of the statements presented in this report, it can be concluded that:

- The model of teacher support via the Regional Learning Teams for applying innovations and introducing changes related to the *early numeracy and literacy programmes* is effective;
- This model can be applied to other regions and schools in the former Yugoslav Republic of Macedonia that participate in *early numeracy and literacy programmes*.
- This model can be also applied for other initiatives in the education sector as part of which teachers are the key stakeholder or contributor to change.

5. SUCCESS FACTORS

As noted in the System Note and Monitoring note 1, the factors influencing the success of the initiative include:

- Consideration of all factors and in all programme phases that influence change in order to ensure innovation sustainability;
- Training model is based on research;
- The model of dissemination is ensuring that quality of training is maintained at all levels;
- Teacher Support is planned and implemented at several levels in order to ensure continuous teacher professional development and effects on student learning;
- Most importantly, teacher support is based on the evidence from application, the teacher being the creator, facilitator and broker of knowledge.

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ANNEX 1- Methodology of e-survey with teachers

The e-survey contained 17 questions, out of which 7 questions with offered multiple choice responses, 4 questions with offered multiple choice responses and a requirement to provide evidence and explanation in support to the given response, 3 questions with a requirement to describe the current situation, and 3 questions required a short response. 7 questions were related to changes in the personal development of the RLT member and 10 questions related to changes in the school. When giving responses, teachers were asked to take into consideration the situation in their school before September 2013, and after September 2013 until May 2014 (the period in which the RLTs were active).

The questionnaire and the instructions for filling in¹⁹ were sent via e- mail to 88 teachers-RLT members, or two per primary school, in total 44 primary schools, 22 for numeracy and 22 for literacy. Responses were from all 44 schools, or 70% RLT teachers responded to the questionnaires on numeracy and 75% to the questionnaire on literacy. There were instances when teachers responded as a group despite the requirement to respond individually. The respondents were 16 % national trainers, 52 % school trainers and 32 % experienced teachers selected as members of RLT. All respondents but one attended all (four) organized RLT meetings.

The responses were processed separately for numeracy and separately for literacy and presented both quantitatively and qualitatively. However, where possible, generalized statements were given. The responses are generalized in order to draw conclusions about the work and the effect of activities of six RLTs and 44 primary schools.

The qualitative responses are used most often to illustrate the views and therefore are quoted as responded. The open questions were responded with well elaborated arguments which demonstrate that the teachers know the programme and the potentials for its application very well. This, by itself, could be considered as one of the effects of the programme upon the level of their professional knowledge and mentoring skills for giving support to the colleagues.

¹⁹ <https://docs.google.com/forms/d/1CtXnZHIvWPA3AdNtnTpka4ACe-ipuJSTyx0I7KHL6vs/viewform>

ANNEX 2- Findings from the e-survey with teachers

Statements by teachers-

Meetings, trainings and workshops

“Support was given about the way in which the students can self-assess themselves”. (respondent from Bitola)

“Support was given for application of the tangram-ways in which students can complete given figures with the help of the tangram” (respondent from Bitola).

“I have realized a training with an older colleague in relation to the wall of words, strong beginnings and endings, thematic network, ordering of words, etc.” (respondent from Skopje).

“A working meeting with a grade teacher who was preparing for the professional exam and was working on class preparation with the application of techniques from literacy” (respondent from Prilep).

Challenges faced by the teachers

“In which operations can the model of sticks be applied? How can I use the table 100 in Grade Two? How can I make easier the multiplication to particular students?” (respondents from Bitola)

“Is it better to apply the technique part – part of a whole or do the whole numbering with the table 100? Are the textual problems well formulated and are all the types of textual problems well covered? For this task, I found three possible ways for solution, are there any others? I applied the technique Model of sticks, but I think that every student did not succeed to apply it adequately, I should devote one more hour or maybe I should not insist on them to visualize it. For the multiplication I know how to make use of the manipulatives, but I have a problem with division.” (respondent from Skopje and respondent from Struga).

“We agreed in the working out, on which texts I should apply which strategies for reading and writing lessons” (respondent from Skopje).

“Developing model classes for mathematics. How can students be included in developing models and learn from it...” (respondent from Struga).

“Developing of checklists for individual and group assessment of students” (respondent from Bitola).

“Should the application of mathematical games be planned as part of regular instruction?” (respondent from Struga) or “In which part of the lesson I should plan and apply the game?” (respondent from Bitola)

“Planning the realization of the teaching content; Structuring the class, selection and implementation of most adequate techniques and manipulatives.” (respondent from Bitola).

“Which are the most adequate strategies for literacy to be planned?” (respondent from Skopje).

“To what extent is it correct and is rightly determined the place of some technique in the daily preparation, and so on?” (respondent from Prilep).

“We had discussions about the time frame and adequacy for the age of the students” (respondent from Skopje).

“What are the most effective ways to teach Roma students multiplication given that they are not attending classes regularly?” (respondent from Bitola).

“How to apply the techniques in work with children with special needs?” (respondent from Skopje).

“Can we use Knocking with fingers in grade 2 with children that have problems in the literacy?” (respondent from Skopje)

“Exchange of ideas for using technology in the realization of contents from mathematic (graphic presentation, ready made presentations as directions for visual setting, setting textual problems and developing thinking operations...) as well as the use of the Smart interactive table and various applications.” (respondent from Skopje).

Examples of support provided to teachers

“A teacher in our school has a class that includes students with difficulties in the intellectual development. She asked for help on how to best support children in understanding addition and division of numbers up to 20. We gave her support for designing individual play activities and used manipulatives for better visualization of the numbers and for using the Table 10.” (respondent from Bitola).

“A colleague reported a challenge with a grade 4 student who cannot memorize the multiplication table although he understands it. The teacher’s fear was later the student will have problems with out-of-table multiplication and division. With the application of various strategies we managed to come to understanding that, the student can work with the out-of-table multiplication and division

“My colleague stated that he had seen from his own experience that in describing objects or characters with more frequent application of the interactive writing, the students have become skilled to give better descriptions – compared to the previous generations.” (respondent from Skopje).

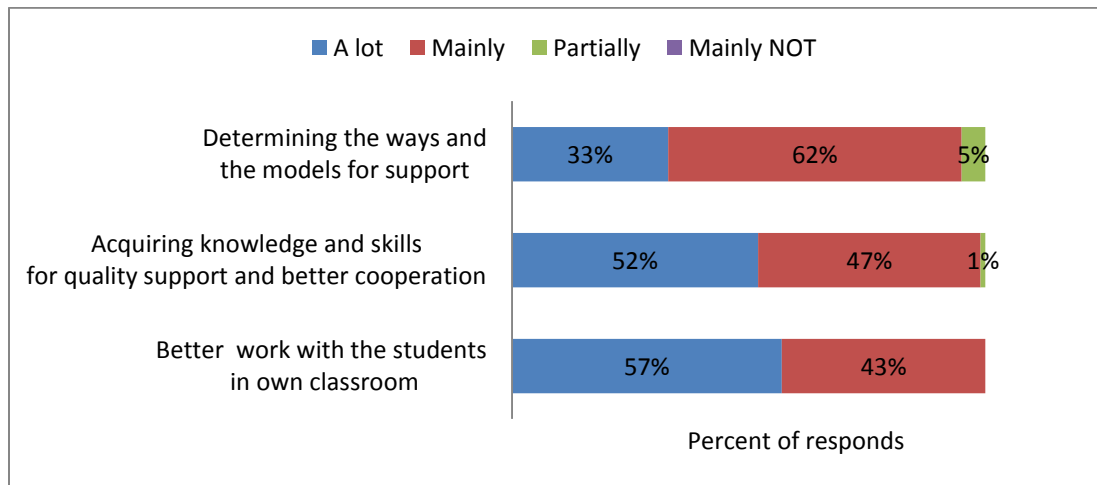
“With a colleague I noticed that on the class hours she had included too many strategies, and so her lessons were not very successful. After the consultation she began to make a selection of number of strategies that are adequate to the contents and the objectives of the lesson and began to realize excellent lessons” (respondent from Skopje).

“A colleague lacked confidence for the implementation of the programme in numeracy. We organized open classes and she got convinced that the techniques and the strategies of the new numeracy programme problem solving can be made easier. She also opportunities for weaker students – step by step to come to a solution.” (respondent from Bitola).

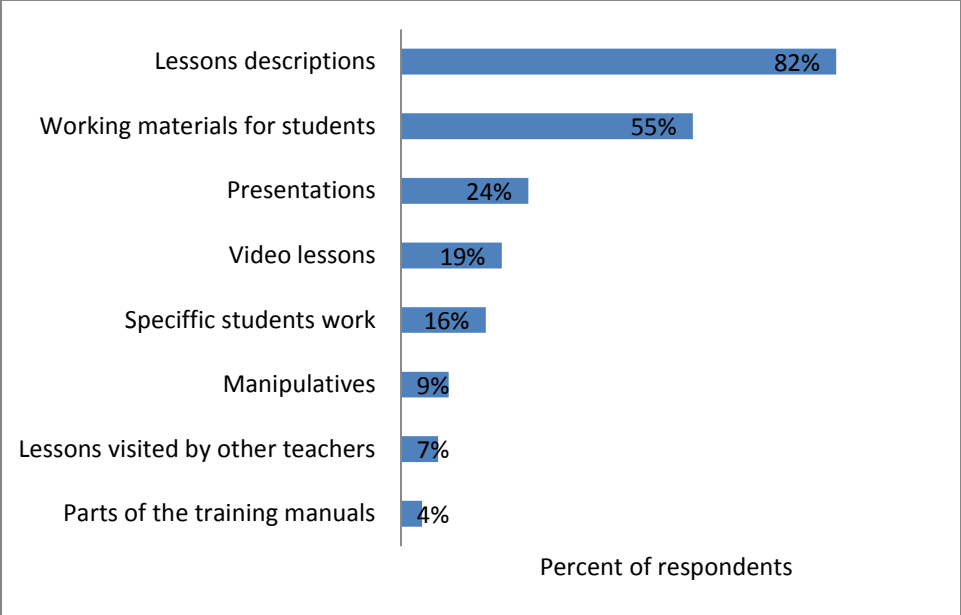
“There was resistance for its application, because the teachers had not understood the manual. I invited them to attend my classes with the application of the LP and I was giving the additional explanations and so their resistance was overcome.” (respondent from Skopje).

“The majority of the teachers were showing resistance by saying that there is nothing new about the programme. With constant cooperation, support and discussion the problem was overcome.” (respondent from Skopje).

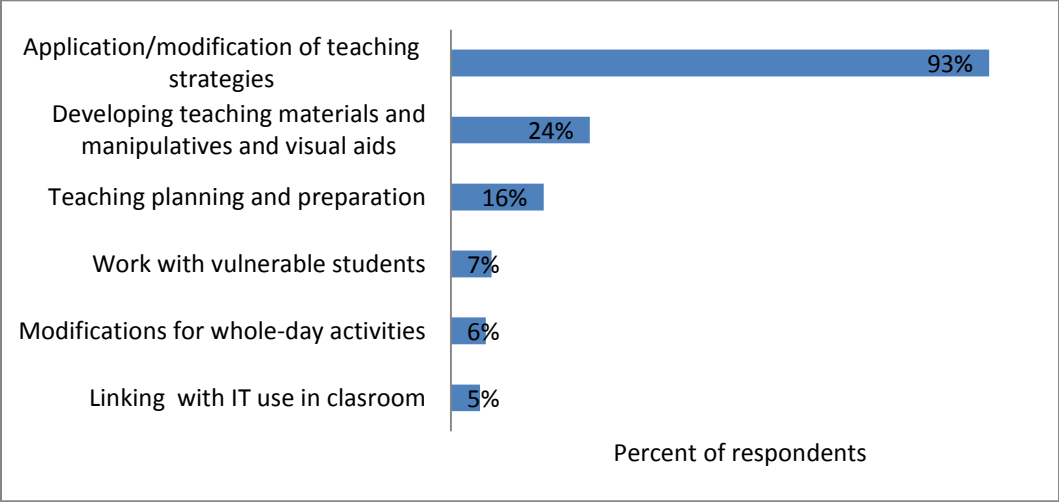
Graphs



Graph 1: Personal advantages of the RTL's teachers by their inclusion in the teams for learning



Graph 2: Developed and shared materials by the RTL’s teachers



Graph 3: Giving concrete support for dealing with the challenges in the instruction