Brief on the Recommendations for USAID/BiH Interventions in Basic Education

Introduction

The United States Agency for International Development Bosnia and Herzegovina Mission (USAID/BiH) tasked the Monitoring and Evaluation Support Activity (MEASURE-BiH) to conduct a brief assessment of basic education in BiH. The objectives were to:

- assess the current situation in the basic education and reform processes in BiH, as well as ongoing interventions and reform processes led by the BiH government and donors; and
- provide recommendations for USAID/BiH on how to program $1 million of basic education funds in 2016 – 2018.

MEASURE-BiH prepared a Draft Assessment Report which included an overview of the basic education system in BiH and an analysis of each of the three education levels in BiH, which fall under USAID's definition of basic education (USAID, 2009): preschool, primary, and secondary education. The Report examined the main issues facing each of these education level in the following six areas covered by USAID basic education earmark:

i) access to or quality of basic education,
ii) pre-service or in-service teacher training,
iii) programs in adult literacy and out-of school youth programs,
iv) basic life skills components of workforce development program,
v) community/familial engagement, and
vi) education system reforms including policy reforms, improved information and data systems, and monitoring and evaluation

Based on the findings detailed in the Draft Assessment Report and based on discussions and lessons learned from other donors that have implemented basic education interventions, MEASURE-BiH identified that the area requiring urgent attention is in key competencies and life skills that build knowledge society and support economic growth.

To improve these competencies, the following eight possible interventions were identified:

1. **Development of operational teaching curriculum in mathematics based on the learning outcomes defined in the adopted outcome-based core mathematics curriculum.** This would entail preparation of a teaching plan and methods in order to achieve learning outcomes defined in the Common Core Curriculum for Mathematics Based on Learning Outcomes already developed by the Agency for Preschool, Primary, and Secondary Education of BiH (APOSO, 2012).
2. **Adjustment of curricula for initial education of teachers by expanding the required number of courses/credits in subjects essential for teaching competencies in pedagogy, psychology, didactics, and teaching methods (PPDM**).
3. **Revision of the system for continuous professional development of teachers** to include development based on needs assessment, long-term planning, mentoring and coaching, as well as monitoring and evaluation of teacher performance. Systemic support for continuous professional development must be ensured in all education institutions, and knowledge transfer and behavioral change should be encouraged.
4. **Upgrade of education information systems** to better align data collection and processing with the decision-making needs. **Capacity building and training in the use of the information system, data analysis, and monitoring and evaluation in order to facilitate evidence-based teaching and decision-making**.
5. **Revision of the system of acquiring teaching competencies for non-teachers and capacity building of non-teachers.**
6. **Technical assistance and support for development of strategic policy documents at the State level**, needed for drawing of future IPA funds.
7. Development of **legislation and models for additional specialization of the adult labor force in accordance with labor market needs.**
8. **Establishment of Vocation Education and Training (VET) Councils** where not established.

MEASURE-BiH concluded that the first two recommendations are most appropriate for immediate USAID/BiH intervention, based on the following criteria:

- interventions should take into account limited financial resources,
- interventions should focus on solving the technical complexities which are essential for children's competencies, and
- interventions should focus on solving core issues rather than alleviating the symptoms.

The remainder of this report provides the background, rationale, and inputs for program description for these two recommendations:

1. **Development of teaching curriculum (plan and methods) in mathematics based on the learning outcomes defined in the adopted outcome-based core mathematics curriculum.**
2. **Adjustment of curricula in initial education of teachers by expanding the required number of courses/credits in subjects essential for teaching competencies in PPDM.**

Recommendation I: Development of Operational Teaching Curriculum in Mathematics

Background

Mathematic competence is defined as the ability to develop and apply mathematical thinking or "mathematization" in order to solve the problems in everyday situations (OECD, 2009). Thus, in addition to giving students skills in numeracy, mathematics is important in providing the broader skills in logic and organized ways of thinking. Mathematic competence includes ability and readiness to use mathematical models of thinking (logical thinking and conclusions, spatial representations, etc.) and presentations (formulas, models, constructions, graphs, charts, etc.). The knowledge includes numbers, measures and structures, basic arithmetic operations, representations, and understanding of mathematical terms and concepts, as well as the awareness of the everyday questions which can be answered by using mathematics. The skills include application of mathematical concepts and processes in everyday context, following the logical path of the arguments or steps in problem solving. The positive attitude is about being interested in logic, ready to explore the application of mathematics in everyday life, respecting logic, and understanding that hypotheses must be falsifiable in order to be scientific.

Mathematic competence is increasingly recognized as one of the key competencies for employability in the modern knowledge society (Education, Audiovisual and Culture Executive Agency, 2011). Mathematic competence is important for success in the technology-based modern workplace. Students with strong fundamental competence in mathematics are more likely to attend and to complete college. Research finds that one difference between students who eventually drop out of high school and those who graduate is lower math scores among the former group (Tyler et al, 2002). The importance of mathematics extends beyond education. Young people who transition to adulthood with limited, basic math skills are likely to find it difficult to function in society. Additionally, mathematic competence is related to better employment outcomes on the labor market (for example, Murnane et al, 2001).

There is no systematic monitoring of the quality of education in mathematics in BiH. The only international research in which BiH participated, the 2007 Trends in International Mathematics and Science Study – TIMSS (Mullis et al, 2008), showed that BiH students scored below the global average in mathematic achievements (with BiH scoring 456 in comparison to global average of 500) and also scoring lower than the other countries from the region that participated in this research (Slovenia and Serbia). TIMSS results showed that a mere 1% of BiH students scored above the advanced TIMMS mathematics benchmark (global average was 2%), while only 10% of BiH students scored above the high benchmark (global average was 15%). Almost one quarter of BiH students (23%) did not reach the lowest benchmark (APOSO, 2009). The analysis of TIMSS mathematics results in three cognitive domains (knowledge, application, and reasoning) shows that BiH students lag behind global averages in all three, with BiH students scoring highest in the lowest level of cognitive domain (knowledge) and lowest in the highest level of cognitive domain (reasoning). Analysis of the results on specific test items shows that when BiH students were faced with problem-solving tasks which required them to first understand the problem and then use the mathematical model to solve it, they either scored significantly worse than completing the straight-forward tasks or did not even attempt to solve the problem. Finally, out of four content domains (Numbers, Geometry, Algebra, and Data and Probability), BiH students scored lowest on Data and Probability, indicating low statistical literacy.

These poor results in mathematic achievements are coupled with high pressure on BiH students to perform well in mathematics and subsequent significant financial resources that are spent on private tutoring in math. A student's GPA in mathematics is one of the main criteria for acceptance into high schools and later into the Science, Technology, Engineering, and Mathematics (STEM) Faculties. A common and growing phenomenon in BiH is hiring of private tutors in mathematics. The Education Support Program of the Open Society Foundation (OSF) conducted research in South and Eastern Europe and Central Asia in 2004. They sampled 1,000 university students in Sarajevo and found that 30% of students had private tutoring lessons in mathematics during secondary school. Private tutoring lessons are usually given by mathematics teachers from another school who are often recommended by student's own teacher. Although no follow-up survey was conducted on this research, the 2011 OSF qualitative research revealed that students are receiving private tutoring at a younger age than before. Since private tutoring is usually provided to students from the families with above-average income, this may imply that the sub-optimal mathematics curriculum and teaching methods may more negatively affect children from lower income households. According to TIMSS results, the children from the families with higher socioeconomic status are likely to have higher scores in mathematics.

The APOSO study on benchmarking for assessment of the education reforms (Husremovic and Đapo, 2013) conducted on the national sample of 1,069 students in BiH also shows that socioeconomic status is one predictor of students' achievements in mathematics. Other predictors are: perception of self-efficacy, attitudes toward mathematics, development of metacognitive skills, gender (females have slightly better results than males), perception of teaching style, clarity of tasks, and teachers' expectations and experience. The same study showed that students perceive mathematics as important and useful for life, but they do not perceive themselves as being good in mathematics.

Given the importance of positive attitudes and self-confidence for learning mathematics and the importance of mathematics in school and career choices, it is essential to address motivational aspects in teaching mathematics.

Based on the evidence of poor achievements by BiH students in mathematics, implications of the high and growing correlation of socioeconomic status with mathematics achievements, as well as students' low motivation and self-confidence in learning mathematics, it is essential to develop a new modern approach to teaching mathematics.

Core Curriculum and Teacher Development

Many advanced countries have revised and modernized their mathematics curriculum to include the learning-outcome approach (Education, Audiovisual and Culture Executive Agency, 2011). Compared to traditional subject-based curricula, learning-outcome based curricula focus on the results of the learning process and are comprehensive and flexible. BiH made an important step towards this modernized approach in 2015, when the Common Core Curriculum for Mathematics Based on Learning Outcomes developed by APOSO (with the support by Save the Children) was adopted by the BiH Parliament (APOSO, 2015). The Common Core Curriculum was developed by eighteen experts (including mathematics teachers and the professors from Mathematics Faculties) and supported by Save the Children. The Core Curriculum is organized within 4 areas, 9 components, 23 learning outcomes, and specific indicators of achievement for each outcome at five milestone levels: preschool level (age 5 or 6), 3rd grade (age 8 or 9), 6th grade (age 11 or 12), 9th grade (age 14 or 15), and upon completion of secondary school (age 18 or 19). The Common Core Curriculum also defines cross-cutting targeted learning outcomes/indicators for each of the key competence relevant for mathematics - mathematic competence, creative and productive competence, communication in native and foreign language, learning how to learn (metacognitive competence), IT competence, and competence in science.

The main advantages to establishing the Core Curriculum based on learning outcomes include:

- learning outcomes being more explicit and understandable for teachers and students,
- emphasis on acquiring key competencies, rather than the content and teaching units,
- addressing higher order thinking (like reasoning, evaluation, and creation) more than reproduction and basic knowledge, and
- better understanding of the grading criteria by parents and students.

While the Common Core Curriculum represents an important first step in modernizing the ways that mathematics are taught in BiH, it should now serve as the basis for development of the operational teaching curriculum, as well as other operational materials, such as guidelines for teachers. Research shows that mathematics curriculum affects the opportunities for students to learn and that opportunity to learn is, in turn, the most important predictor of student achievement (National Research Council, 2001). Furthermore, research shows that some curricula can improve the average student's percentile rank in mathematics by as much as 12 points more than other curricula (Agodini et al. 2009, 2010).

A 2013 study on benchmarking for assessment of the primary education reforms (Husremovic and Đapo, 2013) also found that student achievement in mathematics was more closely correlated to students' perception of teachers' work (perception of teaching style, clarity of the tasks, and positive expectations from teacher) than to teachers' perception of their own teaching effectiveness. It is essential for mathematics teachers to develop and apply sound knowledge and understanding of pedagogy as well as mathematics as a subject (Education, Audiovisual and Culture Executive Agency, 2011). The global scientific community has increasingly recognized that teaching mathematics is a science in itself, with several scholarly journals being developed specifically to research teaching of mathematics (such as International Journal of Mathematics Education, Teaching Children Mathematics, Mathematics Teaching in the Middle School, Mathematics Teacher Educator, and Mathematics in School). In order to meet the new global standards and new requirements set within the adopted BiH Common Core Curriculum for Mathematics, professional development of mathematics teachers will need to be modernized within a systemic approach. In addition to professional mathematical knowledge, effective teaching of mathematics requires understanding and application of the essential teaching competencies of PPDM. Therefore, the PPDM principles should be integrated within the operational teaching curriculum in mathematics.

Program Description for a Possible Intervention

The purpose of this intervention is to develop operational teaching curriculum in mathematics based on the learning outcomes defined in the adopted core mathematics curriculum. The goal is to improve students' employability through increased quality and equity in mathematics education.

The intervention should include:

1. Initial set of meetings with all relevant stakeholders and potential members of the Working Group for Developing Operational Teaching Curriculum for Mathematics. This should include APOSO, Ministry of Civil Affairs of BiH, Entity and Cantonal Education Ministries, Pedagogical Institutes, professors from the Mathematics Faculties/Departments of all major universities in BiH, Associations of Mathematics Teachers, relevant NGOs (such as Save the Children, Step by

Step, OSF, School2School and osnovna.ba), as well as student representatives.

2. Gathering a team of local and international experts who will be contracted by the implementer to lead the intervention. International expert(s) should have specific experience developing successful operational teaching curricula in mathematics in other countries. Local experts should have specific knowledge and experience of working with educational institutions in BiH, preferably with backgrounds in mathematics, pedagogy, and psychology.
3. Formation of Working Group for Developing Operational Teaching Curriculum for Mathematics to include local and international experts contracted by the implementer, as well as the representatives of all relevant stakeholder institutions/groups such as APOSO, Ministry of Civil Affairs of BiH, Entity and Cantonal Education Ministries, Pedagogical Institutes, professors from the Mathematics Faculties/Departments of all major universities in BiH, Associations of Mathematics Teachers, relevant NGOs, student representatives, pedagogues, psychologists, (innovative and competent) mathematics teachers, and education experts from non-governmental sector. Such broad membership in the Working Group will ensure a participatory approach to the curriculum development, in addition to facilitating a sense of local ownership by all relevant stakeholders. This will also help to secure the intervention's chances of sustainability and implementation success.
4. Desk review of all relevant BiH documents, and in particular, the Common Core Curriculum for Mathematics Based on Learning Outcomes and Guidelines for Implementation of Common Core Curriculum.
5. Desk review of relevant international literature, research, and recommendations on operational teaching curriculum in mathematics and innovative approaches for training mathematics teachers.
6. Desk review of relevant materials and data collection (examples include interviews and administrative surveys) on current practices in teaching mathematics in BiH, as well as on the curricula for initial education of future mathematics teachers at the BiH Universities.
7. Drafting Operational Teaching Curriculum for Mathematics based on the Common Core Curriculum and best global practices for 1) preschool, 2) primary and 3) secondary general and vocational schools.
8. Preparation of the Guidelines for the Operational Teaching Curriculum Implementation (Implementation Guidelines) and manuals for teacher trainings for all levels of education.
9. Pilot-testing the Operational Teaching Curriculum and Implementation Guidelines with a group of teachers (and students who are in initial education studying to be teachers), as well as with the students in mathematics courses in primary and secondary schools.
10. Finalizing the Operational Teaching Curriculum and Implementation Guidelines to incorporate feedback from pilot-testing.
11. Drafting recommendations for adjusting the initial education of mathematics teachers to be in line with the 1) Common Core Curriculum for Mathematics Based on Learning Outcomes, 2) Operational Teaching Curriculum, and 3) Implementation Guidelines.
12. Designing and delivering teacher training and certification (for example, through a model similar to what has been implemented through CIVITAS BiH[1]).
13. Continuous advocacy campaign on the curricular reform aimed at students, parents, and general public.

USAID/BiH should also consider rigorously evaluating the effectiveness of new mathematics curriculum, either through random assignment in the test/pilot phase or by quasi-experimental design focusing on learning outcomes associated with the introduction off the new curriculum.[2]

Intervention Advantages and Risks

The advantages of choosing this option for USAID/BiH intervention include:

- Direct contribution to improving key competencies and life skills that build knowledge society and increase employability of BiH students. Development of Operational Teaching Curriculum, guided by defined learning outcomes, would help mathematics teachers to align their teaching processes and methods with student needs, to motivate students to learn and use mathematics, and to introduce other important competencies in teaching mathematics (such as productive and creative competence, communication, and metacognitive competence).
- Contribution to alleviating inequity in education based on socio-economic status. General international findings that students from lower socio-economic status perform worse in mathematics and later earn less, is further exacerbated in BiH by over-reliance on private tutoring. This intervention can provide better in-class education for all students, thus reducing the correlation of socio-economic status with mathematics achievement and later, increasing income of all students.
- As a result of negative public opinion on the quality of mathematics education and BiH's poor score on international tests, this proposed intervention is likely to have broad public support.
- The timing for such an intervention is appropriate, as the Common Core Curriculum for Mathematics Based on Learning Outcomes was recently adopted and all relevant high-level strategic documentation serving as the basis for development of Operation Teaching Curriculum for Mathematics was prepared by APOSO. In interviews with APOSO representatives, they noted that APOSO strongly supports such an intervention and

[1] http://civitas.ba/.

[2] For an example of such evaluation of mathematics curriculum in primary school, see Agodini (2009).

would be ready to cooperate closely with USAID/BiH and the implementer.

- The mathematic competence area does not have political connotations in BiH (unlike areas which involve so-called "national group of subjects"). Thus, no political obstacles are envisaged in implementing this intervention.
- This intervention would fit nicely with the work of Save the Children, which supported the development of the Common Core Curriculum for Mathematics Based on Learning Outcomes and is also working on the education of teachers in language areas. Save the Children plans to continue teacher training support for other areas, so the implementer of this USAID/BiH intervention can explore the ways of cooperating with them, particularly in the process of teacher training.

Potential risks, and options for mitigating them, include:

- Ideally, curricular reform should be comprehensive and done simultaneously for all areas and subjects—with the aim of recognizing the importance of cross-curriculum holistic approach—while this proposed intervention would focus only on one area: mathematics. This particularly refers to the connection of mathematics to science and IT areas. While broadening the scope of intervention to include a comprehensive approach to numerous areas is not feasible within the financial funds currently set aside, depending on exact implementation mechanisms, the implementer could consider also developing core operational teaching curriculum for science. In addition, it should also be noted that there have already been donor interventions that focused on some particular area (e.g. in languages by Save the Children and history by the US Embassy and OSCE). Comprehensive reform in all areas is unlikely to happen in the short to mid-term, due to both lack of financial resources and the political obstacles associated with the so-called "national group of subjects." This intervention, although partial, could be the catalyst for the curricular reforms in other areas if implemented correctly.
- There is a possibility that some official stakeholders would not want to be part of the reform. This could include Ministries, Universities that provide initial mathematics education to teachers, and the mathematics teachers themselves. This risk can be mitigated by implementing a full participatory approach and including all relevant these stakeholders in all stages of the work on the development of Operational Teaching Curriculum and Implementation Guidelines. Furthermore, targeted advocacy aimed at general public will create the additional motivation for these stakeholders to work on this reform.

Recommendation2: Adjustment of the Curricula for Initial Education of Teachers to Focus More on PPDM

Background

Quality of teachers is an essential factor for student achievement, regardless of prior student learning and student socioeconomic status (OECD, 2014). In addition to teachers' academic qualifications and experience, quality of teachers also depends on teaching competencies in pedagogy, psychology, didactics, and teaching methods - PPDM (for example, European Commission, 2013, Caena, 2014, Goe et al, 2008, Marinkovic et al, 2012). Pedagogical competence in teaching refers to the specialized knowledge of teachers to create an effective teaching and learning environment for all students by integrating the content knowledge of a specific subject and the pedagogical knowledge of teaching that particular subject. Psychological competence in teaching refers to the knowledge of individual student characteristics and learning processes, as learning occurs in a social context and learning success depends on the general cognitive and affective characteristics. Didactical competence refers to the ability of a teacher to transfer knowledge to students in a way that will make students interested in a process of learning. Competence in teaching methods refers to selection of principles and methods used to achieve the desired learning in students, based on student characteristics, and the type of learning intended to occur.

Lessons from Finland (Sahlberg et al, 2011), the top-scoring student achievement country in international research, show that one of the key success factors for student achievement is improved initial education of teachers, with a focus on both the thinking process and cognitive skills. There is no data on the level of teaching competencies in PPDM in BiH. However, below-average scores of BiH students in international research (including TIMSS) in combination with the fact that the initial education of teachers in PPDM is generally very limited, may indicate that BiH teachers lack these important capacities.

Initial education of teachers (i.e. pre-service teacher training) in BiH is focused on subject-matter expertise rather than PPDM teaching competencies (Center for Policy and Governance, 2010). The curricula in teacher studies programs are designed completely by the core Department within each Faculty. Because of this autonomy, curricula vary greatly (among different Universities as well as within university among different Faculties) causing insufficient pre-service education in PPDM to be conducted. Recent research shows that the PPDM-related teaching methods employed in BiH are outdated and that the number of European Credit Transfer and Accumulation System (ECTS) credits available in PPDM varies. This is, in all cases, insufficient in comparison to the most common EU practice of 60 ECTS credits (Abadžija, 2015 and Marencic-Pozarnik, 2011).

Low teaching capacities in PPDM are partially related to the fact that the education system in BiH is predominantly centralized in terms of pre-determined teaching lessons. This minimizes the role of teachers in the education process and makes it more of an implementation role, rather than a pro-active, creative, and stimulating role. This is further exacerbated by an ambiguous framework for the initial education of teachers. Adequate teaching of competencies must include the competence to stimulate cognitive, socio-emotional, and motor development of the students. Competent teachers, regardless of subject-matter they are teaching, are interested in and aware of students' individual

needs and motivation triggers. They understand that each students' learning process is different. High quality teachers are able to implement the subject-matter operational teaching curriculum at both individual and collective levels, thus making the process stimulating for all students. Consequently, there are numerous expectations from teachers:

1. Expert pedagogical, psychological, and methodic knowledge in developmental and pedagogical psychology, pedagogy, teaching methods and techniques, as well as their adjustment to fit their students' ages and levels of cognitive development.
2. Personal and professional accountability and ownership of the teaching and learning processes. This refers to autonomy in teaching and accountability for student achievements.
3. Exemplary system of values, centered on care for students' best interest and well-being. This is essential—given the importance of teachers in influencing students' overall development, especially at early age.
4. Accountability and pro-active initiatives in continuous self-development and self-improvement, including continuous professional development in modern and innovative techniques.
5. Contribution to creating and sharing knowledge on successful learning and teaching methods. Culture of learning communities needs to be encouraged among teachers.
6. Active contribution to continuous monitoring and rigorous research, with the goal of evidence-based teaching. Teachers must be researchers of education process and be able to design and conduct research, monitor changes in process of education, and initiate changes when necessary.
7. Taking a lead role in developing and promoting the education system as a whole.

In order for teachers to achieve these expectations, they should possess, among other qualities, the following competencies:

- competencies in the subject matter they teach
- competencies relating to learning and teaching processes (primarily competencies in methods and techniques of teaching)
- competencies in providing support to students' personal development (competencies in psychology)
- competencies in communications and cooperation with students, parents, and colleagues (competencies in psychology and pedagogy).

PPDM in Current System of Initial Education

Teacher studies programs are offered in the following Faculties in BiH: Pedagogy Academies (which educates teachers who teach in pre-school and the first 4 or 5 years in primary school), Philosophy and Philology Academies (which educate teachers in the fields of social and human sciences and languages), Sciences and Mathematics Faculties (which educate teachers in the field of natural sciences), Arts Academies (which educate teachers for the subjects in fine arts), as well as religious studies colleges.

The admission criteria for these programs vary greatly, ranging from no entrance exam (where admission is based only on high school GPA) to more comprehensive entrance exams, and in some cases, there are also pre-entry exam criteria. In the cases where the entrance exam is a part of the admissions criteria, it is based on the subject in which student will eventually teach and in the native language, with no PPDM-related questions. The exception are the Psychology Departments that also have psychological and general knowledge tests within the entrance exam. Pedagogy Academies assess of verbal, motor, and music skills in addition to the entrance exam.

Upon being accepted to these teacher studies programs, students have varying levels and amounts of PPDM-related courses. In most cases (e.g. in largest Universities in BiH, Sarajevo University and Banja Luka University), only a basic introduction to PPDM-related subjects is given and it is usually combined with Pedagogy and/or Psychology courses (with the exception of Psychology Departments who also have Pedagogical Psychology). On average students have two of these PPDM-related courses in total. In other words, students get around 12-15 ECTS credits on average, in comparison to 60 ECTS credits commonly recommended in EU. In addition to PPDM-related courses being limited in the number offered, they are also generally given in pedagogically poor conditions (Abadzija, 2015), with over 40 students in a single group (and over 100 in some Faculties). Moreover, a wide array of topics are included in these courses, which results in only limited attention being devoted to each topic. PPDM-related courses are represented in the largest scope in Pedagogy Academies.

Course work on inclusive education is almost non-existent in BiH, although teachers are expected to have competencies related to working with children with development impairments. An essential part of teacher studies should be devoted to practical application of theoretical knowledge (e.g. European Commission, 2013). In BiH, however, this is at a minimum level and is limited to students shadowing some in-school courses and afterwards delivering one course. Research shows that another key factor for success in the initial education of teachers is mentoring by school professionals and teaching practitioners (Caena, 2014), which is not practiced in BiH.

Program Description for a Possible Intervention

The purpose of this intervention is to develop a standardized approach to PPMD-related courses in all curricula for initial teacher education, based on best international practices. In addition to defining the number and types of PPMD-related courses, guidelines with the exact scope of what should be taught in each course should be developed. This, inter alia, includes a greater focus on the practical application of theoretical knowledge, inclusive teaching, and mentoring system. The goal is to increase the overall basic education learning outcomes in BiH

by improving quality of teaching through increasing teachers' capacities in PPDM-related subjects.

The intervention should include:

1. Initial set of meetings with all relevant stakeholders and potential members of the Working Group for Developing Standards for PPDM-related Initial Education of Teachers. This will include the Agency for Development of Higher Education and Quality Assurance (HEA), representatives from Faculties that offer teacher studies programs in BiH, APOSO, Ministry of Civil Affairs of BiH, Entity and Cantonal Education Ministries, Pedagogical Institutes, EU Delegation, British Council, and relevant NGOs.
2. Gathering a team of local and international experts who will be contracted by the implementer to lead the intervention. International expert(s) should have specific experience in developing and/or the delivery of successful PPDM-related parts of initial teacher education and teaching curriculum in other countries. Local experts should have specific knowledge and experience of working with educational institutions in BiH, preferably with background in PPDM.
3. Formation of the Working Group for Developing Standards for PPDM-related Initial Education of Teachers to include local and international experts contracted by the implementer, as well as the representatives of all relevant stakeholder institutions/groups such as HEA, representatives from Faculties that offer teacher studies programs in BiH, APOSO, Ministry of Civil Affairs of BiH, Entity and Cantonal Education Ministries, Pedagogical Institutes, and relevant NGOs, representatives of students of teacher studies, teachers of PPDM within initial teacher education programs, pedagogues, psychologists, and education experts from non-governmental sector. Such broad membership in the Working Group will ensure a participatory approach to developing Standards, as well as facilitate a sense of local ownership by all the relevant stakeholders. This should secure intervention sustainability and implementation success. In particular, HEA should be closely involved in the work, given that this institution will be developing standards for accreditation of all higher education programs within all Universities in BiH, thus also including teacher studies programs.
4. Desk review of all relevant BiH documents, and in particular the current curricula for teacher studies programs in all Universities in BiH.
5. Desk review of relevant international literature, research, and recommendations on curricula for teacher studies programs and innovative approaches and best practices.
6. Drafting Standards for PPDM-related Initial Education of Teachers based on best global practices. This should include learning outcomes, as well as teaching unit standards. The new curriculum should be designed to include 60 ETCS credits devoted to PPDM-related courses.
7. Preparation of the Operational Guidelines for Application of Standards for PPDM-related Initial Education of Teachers with the exact scope of what should be taught in each recommended PPDM course, including greater focus on the practical application of theoretical knowledge, inclusive teaching, and mentoring system.
8. Presentation of the Standards and Operational Guidelines to a group of PPDM professors in teacher studies programs and initial teacher education students.
9. Finalizing the Standards and Operational Guidelines to incorporate feedback.
10. Designing and delivering training and certification to professors of PPDM-related courses in teacher studies programs.
11. Continuous advocacy campaign about initial teacher education reform aimed at students, parents, and general public.

Intervention Advantages and Risks

Advantages of choosing this option for USAID/BiH intervention include:

- This intervention, although limited in scope, has the potential for benefiting the whole education system, as improvement in teaching competencies are likely to occur for all teachers in BiH. The intervention will be targeted directly at one of the main causes for general poor teacher quality, rather than alleviating the symptoms.
- As a result of negative public opinion on the quality of teaching competencies in PPDM, this intervention is likely to have broad public support.
- The timing for this intervention is appropriate, as the HEA is envisaged to develop accreditation standards for all University study programs (thus including teacher studies programs) and start the actual accreditation process in the next couple of years. In interviews with the HEA representatives, they noted that HEA strongly supports such an intervention and would be ready to cooperate closely with USAID/BiH and the implementer, which includes making Standards obligatory for accreditation of University study programs. In addition, Universities in BiH are increasingly recognizing the need for such reform, with University of Mostar already increasing their PPDM-related focus on initial teacher education (based on demand of their students from Croatia).
- Although there are no donor interventions specifically focused on initial teacher education, this intervention would complement the work of the ongoing EU-funded project on Development of Qualification Framework for General Education in BiH, implemented by the British Council. Within this project, Standards for Teaching Profession are being prepared for pre-school, primary, and secondary education. These Standards for Teaching Profession are expected to define the general minimum of recommended ECTS credits in initial education for PPDM-related subjects, which is in line the EU practices. Thus, Standards for PPDM-related Initial Education of Teachers and Operational Guidelines would be harmonized with the Standards for Teaching Profession.
- Step by Step has been working on continuous professional education of teachers. In interviews with their representatives, they expressed the need for an intervention at the initial teacher education level. This potential intervention could eventually also inform other donor work in continuous professional

development of teachers by basing the continuous professional development on Standards and Operational Guidelines.

Potential risks and options for mitigating them include:

- There is a possibility that some official stakeholders would not want to be part of the reform. This could include Ministries, Universities that provide initial teacher education, and the teachers of the PPDM-related courses in initial education. This risk can be mitigated by implementing a full participatory approach and including all relevant these stakeholders in all stages of the work on the development of Standards and Operational Guidelines. Moreover, the fact that the HEA would make the Standards obligatory for accreditation of University study programs would create the motivation for stakeholders to work on this reform. Finally, targeted advocacy aimed at general public would also increase stakeholders' motivation to cooperate.
- There would be a significant time-lag between the intervention and its practical application in terms of teachers with increased PPDM competencies starting to teach. However, results of most education interventions are only visible in long-term, as fundamental changes in education require patience and perseverance.

References

1. Abadzija, M. (2015). *Initial Teacher Education at the University of Sarajevo*. Centre for Policy and Governance. https://issuu.com/cpubih/docs/sa__etak_analize__inicijalno_obrazo
2. Agency for Standards and Evaluation in Education for the Federation of Bosnia and Herzegovina and Republika Srpska (2008). *Report on the Achievements of Students' Final Grade of Primary School in Bosnia and Herzegovina in Mathematics.* http://www.aposo.gov.ba/hr/files/2012/10/TIMSS_izvjestaj_prirodne_nauke_CRO.pdf
3. Agency for Preschool, Primary and Secondary Education (2009). *Secondary Analysis of the TIMSS 2007 Results for Bosnia and Herzegovina.* http://www.aposo.gov.ba/wp-content/uploads/2012/08/Sekundarna_analiza_TIMSS_2007.pdf
4. Agency for Preschool, Primary and Secondary Education (2011). *Model for Improving the System of Continuing Professional Development of Educators, Teachers, and Associates in Bosnia and Herzegovina.* http://www.aposo.gov.ba/wp-content/uploads/2012/08/KPR-bosanski-26.11.pdf
5. Agency for Preschool, Primary and Secondary Education (2011). *Quality Work Standards for Educator, Pedagogues, and Directors in Preschool Education.* Studio Jordan, Sarajevo *http://www.aposo.gov.ba/hr/files/2012/10/Predskolstvo_Standardi_kvalitete_rada_-odgajateljica_pedagogica_-i_-direktorica_cro.pdf*
6. Agency for Preschool, Primary and Secondary Education (2013). *Common Core Curriculum for Bosnian, Croatian, and Serbian Languages Based on Learning Outcomes.* http://www.aposo.gov.ba/hr/files/2012/10/ZJNPP-definirana-na-ishodima-u%C4%8Denja-za-bosanski-hrvatski-i-srpski-jezik.pdf
7. Agency for Preschool, Primary and Secondary Education (2014). *Common Core Curriculum for Foreign Languages Based on Learning Outcomes.* http://www.aposo.gov.ba/hr/files/2012/10/ZJNPP-za-strane-jezike-BOS-.pdf
8. Agency for Preschool, Primary and Secondary Education (2015). *Guidelines for Implementation of Common Core Curricula.* http://aposo.gov.ba/wp-content/uploads/2015/Smjernice%20za%20implementaciju%20ZJNPP.pdf
9. Agency for Preschool, Primary and Secondary Education (2015). *Common Core of Curricula for Social Sciences and Humanities Based on Defined Learning Outcomes.* http://aposo.gov.ba/wp-content/uploads/2016/ZJNPP-a%20d-h%20B.pdf
10. Agency for Preschool, Primary and Secondary Education (2015). *Common Core Curriculum for Cross-Curricular and Inter-Subject Areas Based on Learning Outcomes.* http://aposo.gov.ba/ZJNPP%20kroskurikularno%20B.pdf
11. Agency for Preschool, Primary and Secondary Education (2015). *Common Core Curriculum for Mathematics Based on Learning Outcomes.* http://aposo.gov.ba/wp-content/uploads/2015/ZJNPP%20matematicko%20podrucje%20HRVATSKI%20.pdf
12. Alibabic, S., Popovic, K., and Avdagic, E., (2012). *Subsequent Acquisition of Primary Education – Andragogical Manual for Teachers*. Franex Sarajevo.
13. Agodini, R., Harris, B., Thomas, M., Murphy, R., and Gallagher, L. (2010). *Achievement Effects of Four Early Elementary School Math Curricula: Findings for First and Second Graders (NCEE 2011-4001)*. Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.
14. Agodini, R., Harris, B., Thomas, M., Murphy, R., and Gallagher, L. (2009). *Achievement Effects of Four Early Elementary School Math Curricula: Findings for First Graders in 39 Schools (NCEE 2009-4052)*. Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.
15. Agodini, R., Harris, B., Seftor, N., Remillard, J., and Thomas, M. (2013). *After Two Years, Three Elementary Math Curricula Outperform a Fourth: Which Math Curriculum Should I Use?* Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.
16. Booth, T. and Ainscow, M. (2010). *Index for Inclusion*. Save the Children.
17. Bozic, A. (2012). *Good Practices and Lessons Learned in the Application of the "Index for Inclusion" Methodology in Elementary Schools in Republika Srpska*. Save the Children.
18. Center for Policy and Governance (2010). *Primary Education in Bosnia and Herzegovina - Quality, Creativity, and Innovation?* Center for Policy and Governance. http://www.cpu.org.ba/media/8348/CPU-Osnovno-obrazovanje-u-Bosni-i-Hercegovini-kvalitet-kreativnost-inovativnost.pdf
19. Caena, F. (2014). *Initial Teacher Education in Europe: An Overview of Policy Issues*. European Commission Directorate - General for Education and Culture School Policy/Erasmus+. http://ec.europa.eu/education/policy/strategic-framework/expert-groups/documents/initial-teacher-education_en.pdf
20. Council of the European Union (2008). *Council Conclusions on Preparing Young People for the 21st Century: An Agenda for European Cooperation on Schools.* Council of the European Union. http://www.consilium.europa.eu/uedocs/cms_Data/docs/pressdata/en/educ/104238.pdf
21. Danielsa, H. D. and Shumow, L. (2003). Child Development and Classroom Teaching: A Review of the Literature and Implications for Educating Teachers. *Applied Developmental Psychology*. http://www.mmiweb.org.uk/hull/site/ibl/downloads/resource_sem1_9.pdf
22. Dragnic, L. (2013). *The Quality and Cost of Education in BiH*. Open Society Fund BiH. http://skolegijum.ba/static/biblioteka/5460fdfd554a6_03Kvalitetitroskoviobrazovanjau BiH.pdf
23. Education, Audiovisual, and Culture Executive Agency (2011). *Mathematics Education in Europe: Common Challenges and National Policies.* http://eacea.ec.europa.eu/education/eurydice/documents/thematic_reports/132en.pdf
24. European Commission (2013). *Supporting Teacher Competence Development for Better Learning Outcomes.* European Commission: Education and Training. http://ec.europa.eu/education/policy/school/doc/teachercomp_en.pdf
25. Fazlic, S. and Maric, N. (2014). *Knowledge, Attitudes, and Practices Survey (KAP Survey) on Early Childhood Education and Development in Selected Municipalities/Cities in Bosnia and Herzegovina.* UNICEF BiH, Sarajevo. https://issuu.com/unicefbih/docs/kap_report_bhs_dubai_english
26. Federal Ministry of Education and Science (2014). *The 2015-2020 Strategic Directions for Development of Career Orientation in the FBiH*. Federal Ministry of Education and Science, Mostar. *http://www.monkstk.ba/attachments/article/475/Strateski_pravci_razvoja_karijerne_orijentacije_u_FBiH.pdf*

27. Goe, L., Bell, C., and Little, O. (2008). *Approaches to Evaluating Teacher Effectiveness: A Research Synthesis*. Washington, DC: National Comprehensive Center for Teacher Quality. http://files.eric.ed.gov/fulltext/ED521228.pdf
28. OSCE Mission in Bosnia and Herzegovina (2010). *Guide for Parent Councils in Primary and Secondary Schools*. Education Department of the OSCE Mission in Bosnia and Herzegovina.
29. Husremovic, Dz. and Djapo, N. (2013). Secondary Data Analysis – Success Predictors for Tests in Mathematics and Bosnian, Croatian and Serbian Languages. In (Agency for Preschool, Primary and Secondary Education) *Benchmarking: Setting Standards in Evaluation of the Reform of Elementary Education*. Sarajevo: Jordan Studio. http://www.aposo.gov.ba/wp-content/uploads/2012/08/Benchmarking-BOS.pdf
30. Husremovic, Dz. and Trbic, Dz. (2006). *Education in a Hidden Marketplace: Monitoring of Private Tutoring*. Education Support Program (ESP) of the Open Society Institute, Budapest.
31. Klein, L. and Knitzer, J. (2006). *Pathways to Early School Success: Effective Preschool Curricula and Teaching Strategies*. The National Center for Children in Poverty (NCCP). http://www.nccp.org/publications/pdf/text_668.pdf
32. MDG Achievement Fund (2011). *Non-enrolment and School Dropout: A Study Based on a Survey of Children and Youth Who do Not Enroll in or Drop out of Primary and Secondary Education*. UNICEF BiH, Sarajevo. http://www.unicef.org/bih/Dropout_EN-1.pdf
33. Marentic-Pozarnik, B. (2011). Teacher Education in Europe between Unity and Diversity. In Valencic Zuljan, M. and Vogrinc, J. (Ed.) *The National School of Leadership in Education* Ljubljana: University of Ljubljana.
34. Marinkovic, S., Bjekic, D., and Zlatic, L. (2012). *Teachers' Competence as the Indicator of the Quality and Condition of Education*. University of Kragujevac, Serbia. http://www.tepe2012.uni.lodz.pl/uploads/ThemenIV/Marinkovi%C4%87,%20Snezana;%20Bjeki%C4%87,%20Dragana%20&%20Zlati%C4%87,%20Lidija.pdf
35. Marks, H., Louis, K. S., and Printy, S. (2002). The Capacity for Organizational Learning: Implications for Pedagogy and Student Achievement. In K. Leithwood (Ed.), *Organizational Learning and School Improvement*. Greenwich, CT: JAI.
36. Mullis, I. V. S., Martin, M. O. and Foy, P. (2008). TIMSS 2007 International Mathematics Report: Findings from IEA's Trends. In *International Mathematics and Science Study at the Fourth and Eighth Grades*. Chestnut Hill, MA: Boston College, TIMSS and PIRLS International Study Center. http://timss.bc.edu/timss2007/PDF/TIMSS2007_InternationalMathematicsReport.pdf
37. Murname, R. J., Willett, J. B., Braatz, M. J., and Duhaldeborde, Y. (2001). Do Different Dimensions of Male High School Students' Skills Predict Labor Market Success a Decade Later? Evidence from the NLSY. *Economics of Education Review*.
38. Murnane, R., Wilett, J., and Levy, F. (1995). The growing importance of cognitive skills in wage determination. *The Review of Economics and Statistics*.
39. National Research Council (2001). *Adding it Up: How Children Learn Mathematics*. Washington, DC: National Academy Press.
40. OECD (2008). International Conference Learning in the 21st Century: Research, Innovation, and Policy: *Assessment for Learning Formative Assessment. Center for Educational Research and Innovation*. http://www.oecd.org/site/educeri21st/40600533.pdf
41. OECD (2009). *PISA Assessment Framework Key Competencies in Reading, Mathematics and Science*. Program for International Student Assessment. https://www.oecd.org/pisa/pisaproducts/44455820.pdf
42. OECD (2014). *Teachers' Pedagogical Knowledge and the Teaching Profession: Background Report and Project Objectives*. Paris: OECD Publishing. http://www.oecd.org/edu/ceri/Background_document_to_Symposium_ITEL-FINAL.pdf
43. Parliamentary Assembly of BiH (2003). *Framework Law on Primary and Secondary Education in Bosnia and Herzegovina*. Sarajevo: Official Gazette of BiH. http://www.erisee.org/downloads/library_bih/Framework%20Law%20on%20Primary%20and%20Secondary%20Educ_engl.pdf
44. Parliamentary Assembly of BiH (2007). *The Framework Law on Pre-school Education in Bosnia and Herzegovina*. Sarajevo: Official Gazette of BiH. http://www.aposo.gov.ba/hr/files/2012/11/OZ-o-predskolskom-odgoju-i-obrazovanju.pdf
45. Sahlberg, P., Hargreaves, A., and Lieberman, A. (2011). *Finnish Lessons: What Can the World Learn from Educational Change in Finland?* Teachers College Press: New York.
46. Soldo, A. and Powell S. (2011). *The Phenomenon of Private Tutoring – Possible Solutions*. ProMENTE - Network of Education Policy Centers – NEPC. http://www.edupolicy.net/no-access/download-id/787/
47. Sondergaard, L., Murthi, M., Abu-Ghaida, D., Bodewig, C., and Rutkowski, J. (2012). *Skills, Not Just Diplomas: Managing Education for Results in Eastern Europe and Central Asia*. Washington, DC: The World Bank.
48. Suciu, A. I. and Mata, L. (2011). Pedagogical Competencies – The Key to Efficient Education. *International Online Journal of Educational Sciences*. http://www.iojes.net/userfiles/Article/IOJES_402.pdf
49. Tyler, John H., Murname, R. J., and Willett, J. B. (2002). Who Benefits From a GED? Evidence for Females from High School and Beyond. *Economics of Education Review*.
50. Tyler, J. H. (2004). Basic Skills and the Earnings of Dropouts. *Economics of Education Review*.
51. UNICEF BiH (2015). *Measuring the Effects of the 300h Preschool Program on Cognitive, Socio-emotional, Language, and Physical Characteristics on Children in BiH*. UNICEF BiH, Sarajevo. http://www.unicef.org/bih/izvjestaj_testiranja-ENGL.pdf
52. USAID (2009). *Clarification of Basic Education Earmark*. http://pdf.usaid.gov/pdf_docs/Pdacn909.pdf
53. *Education Centre for Democracy and Human Rights – Civitas* http://civitas.ba/