Effectiveness of Individualised Support Measures in the Dropout Prevention Model (DPM) in Serbian Schools[1]

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The purpose of this paper was to evaluate the effectiveness of individualised support measures within the Dropout Prevention Model (DPM) after two years of implementation in 10 pilot schools in the seven most vulnerable municipalities in Serbia. The core activities within the DPM identification of students at risk of dropping out were the calculation of the Risk Index (RI) for each of them, and the development of the Individual Plans for Dropout Prevention (IPDPs) as a tool for sustainable planning and provision of support to at-risk students. The sample consisted of 450 students with IPDPs from the pool of 5,884 students with the calculated RI. The evaluation of individualised support measures was conducted through quasi-experimental design at different time points, a qualitative analysis of structural aspects of IPDPs and the examination of the relationship of categories of measures and risk factors, RI and key indicators. Results demonstrate desirable effects of the individualised measures on the prevention of dropout. The *Instrument for identification of students at risk of dropout* showed high sensitivity for students at very high dropout risk. Only 5% of the students at very high dropout risk for whom IPDPs were developed dropped out of school after two years of implementation of the DPM. Further analysis of the correspondence between the types of support in IPDPs showed a good adjustment to the types of

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risk factors. The schools demonstrated a good capacity to decrease the influence of the risk factors from the immediate students' environment, such as poverty. The results presented arguments that support further scaling up of the IPDPs within the DPM to the other schools.

Key words: prevention of dropout, dropout risk factors, individualised support measures, Individual Plans for Dropout Prevention, equity

Introduction

The concept of risk is defined as the tendency of individuals towards activities with an uncertain outcome (Kraemer et al., 1997 according to the Lee & Burkam, 2003). Although dropout is the consequence of a personal decision, such a decision is always influenced by environmental, school, family and individual factors. Therefore, the description of dropout risk in this research is grounded in the identification of presence and intensity of influence of several risk factors in the environment where the individual, i.e. the student lives (Jovanović, Čekić Marković, Veselinović, Vušurović & Jokić 2016; Jovanović, Čekić Marković &Jokić, 2016). Successful identification of the dropout risk factors enables us to calculate the likelihood of school leaving among students affected by those factors. For example, there is more chance that a student with the history of absenteeism and grade repetition (Lee & Burkam, 1992; 2003), an underachieving student (Bryk & Thum, 1989) or a student who has somehow alienated from school life (Finn, 1989; Hammond, Linton, Smink & Drew, 2007; Wilson, Tanner-Smith, Lipsey, Steinka-Fry & Morrison, 2011; Lee & Burkam, 2003) will leave school at a certain point. At the same time, many studies point out that students who enrol in poorer schools and are taught by less qualified teachers often face a decrease in academic achievements and have fewer chances for further education (Aikens & Barbarin, 2008; Hanushek, Kain & Rivkin, 2009; Hattie, 2009; Hidi & Harackiewicz, 2000; Ingersoll, 1999).

The dominant paradigm in the studies dealing with dropout reflects the perception that the risk factors are the characteristics inherent either to the students or to the family and the social context they come from (Hammond et al., 2007), thus neglecting the capacities of different sectors, especially education, and the power of various interventions to prevent and combat dropout and the risk factors (Lee & Burkam, 2003; Jovanović et al., 2016). Nevertheless, through adequate identification of at-risk students and assessing the risk level they are under, it is possible to make more guided and structured individual support measures (Jovanović et al., 2016; Veselinović, Vušurović, Jovanović & Čekić Marković, 2016), which are better adjusted to the individual students' needs, context and risks. Therefore, schools

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are in a position to provide adequate compensation, social participation, and scaffolding for better social and cognitive development of a student (Cole, 1996; Rogoff, 2003; Vygotsky, 1993; Wertsch, 1991). Evidence also shows that deprived environments, in which the poorest children grow, affect the achievement on different cognitive tests and therefore have a negative impact on academic achievement, which in turn can "trigger" dropout (Baucal, 2006; Biro, Smederevac & Tovilović, 2009; Jovanović et al., 2016). Hence, dropout prevention has an important influence on various social outcomes, from poverty reduction to the better social cohesion and health issues (Nacionalni prosvetni savet, 2015; OECD, 2010; Stiglitz, 2012; Wilkinson & Picketi, 2010). In this context, the school's role as a mediation and compensation resource for achieving higher equity has a great importance in providing individualised support measures adjusted to the children's needs and the risks they are exposed to (Ceci, 1991; Engeström, 2001; OECD, 2010). Additionally, the schools which are not sufficiently inclusive and do not promote the atmosphere of wellbeing, peer acceptance and cooperation between students, indirectly "lead" certain students towards dropout, especially those who, for other reasons (e.g. poverty) are already at risk of leaving the school (Felner, Seitsinger, Brand, Burns & Bolton, 2007; Lee & Burkam, 2003). Dropout rates were shown to be lower in schools with better teachers (based on the evaluation of students) while the dropout rate was higher in the schools with a larger number of students from marginalised groups, the schools with a larger number of students in general (over 900 students), the schools with higher grade repetition rate, the schools situated in larger urban centres, as well as in the schools where teachers' salaries were lower (Rumberger & Thomas, 2000). For example, for each repeated grade, school dropout probability increases by four times (Ferić, Milas & Rihtar, 2010). The findings also indicate that interventions and changes in the school based on the needs of students, which lead to the creation of school environment in the form of "small learning communities", contribute to the welfare of students, higher students' achievement, and the reduction of dropout (Felner et al., 2007).

At the same time, students with low school wellbeing stated they were not "connected" with teachers; dropout was higher where the social capital of the school was lower – measured through the relationship of students with teachers and according to teachers' assessment of communication with students outside classes (Croninger & Lee, 2001). Qualitative studies also indicate that positive social relationships may create strong impetus with students to attend schools, even with those students who state that the work in school is hard and whose expectations are difficult to meet

(Lee, Smerdon, Alfeld-Liro & Brown, 2000). It is confirming the opinions that school is one of the most important creators of the social capital that someone acquires, and that social capital can be one of the main generators of social inequality (Bourdieu, 1984; 1986). Higher social capital in schools generates more incentives, social norms and support in decision making within the student's social groups. Additionally, it supports behavioural patterns that shape the goals of individuals and their chances of achieving those goals, with education and employment as the most important ones (Croninger & Lee, 2001).The results from Serbia show that the presence of abuse, discrimination, insults, and disrespect of students by teachers and other students can often, combined with other factors, be a "trigger" for dropout (Pavlović Babić, Krstić, Stepanović, Videnović, Lazarević, Simić, & Marković, 2013).

Some studies have pointed out that the parents from families with lower socio-economic status pay less attention to the education of their children and that the children from those families progress slower in school and have lower achievements (American Psychological Association, 2012; OECD, 2010). The students from such families master the language more slowly, acquire phonological awareness later than other students, and have reading difficulties more often (Aikens & Barbarin, 2008). Additionally, understanding the risk factors coming from outside the school is highly important for the creation of effective dropout prevention measures (Lyche, 2010). These factors are mainly present in poor environments, among students of lower socio-economic status, and besides poverty or traumatic and negative experiences may also consider problems in behaviour. As the specificities of the cultural and geographical context significantly shape the influence of these factors (on students and their education), we have mostly relied on the Serbian study in defining these factors (Pavlović Babić et al., 2013).

Based on this solid theoretical and empirical grounding, the Dropout Prevention Model (DPM) was developed and its overall effectiveness was proved by the results obtained after DPM's piloting in 10 secondary and primary schools situated in the Serbian municipalities with the highest risk of student dropout (Jovanović et al., 2016; Jovanović, Čekić-Marković & Jokić, 2016).

Dropout Prevention Model

The Dropout Prevention Model (DPM) consists of three main components (Jovanović et al., 2016). The first component of the DPM is the Early Warning and Intervention System (EWIS), whose effectiveness was demonstrated in other European countries and in the USA (Antonowicz,

2012; European Commission, 2011; 2013; Stuit, O'Cummings, Norbury, Heppen, Dhillon, Lindsay & Zhu, 2016; UNICEF, 2011). The EWIS activities were dedicated to the identification of students with the highest dropout risk and the development of individualised support measures for each student at risk of drop out in the form of the Individual Plan of Dropout Prevention (IPDP). The second component aims at prevention and response measures at the school level (parental engagement, peer support, the model for remedial teaching), while the third component of the model is aimed at the capacity building and the activities targeted at changing school culture.

Identification of students within DPM's EWIS

The *Instrument for identification of students at risk of dropout* (Jovanović et al., 2016) enables the calculation of the Risk Index (RI) for each student. The RI is presented in the form of a composite score, calculated on the basis of the weighted influence of risk factors. The risk factors include socio-economic status, absenteeism, academic achievement, student behaviour, peer acceptance, the existence of the conditions for acquiring social welfare and the existence of other risk factors, such as abuse and neglect, teen pregnancy, repeating grades, exile, incomplete families and/or experienced trauma (see Appendix 1). Five levels of intensity of risk influence are identified, where the largest impact of dropout risk factors is labelled as Level 1 and the lowest intensity of risk factors as Level 5. The levels of dropout risk intensity within the instrument do not represent continual dimensions as in the scales of estimation but may be described as the levels of dropout risk intensity based on qualitative descriptions which tend to be exhaustive and mutually exclusive. The teachers were trained to complete the instrument, i.e. to assess and evaluate the existence of risk factors and the level of their intensity. This training consisted of psychological principles that must be followed, the guidelines on the types of data based on which the final assessment should be made, as well as of the instructions how to recognise the presence of particular risk factors if they are not immediately visible. The effects of the risk factors are weighted differently (based on the existing research, domestic and foreign literature and knowledge of the education system in Serbia) and separately, for primary and secondary vocational schools, in order to obtain a reliable index of the dropout risk for each student (Table 1). The levels of dropout risk intensity are designed so that they are more discriminatory for the students at greater risk of dropping out.

Table 1. Different weights of assumed risk factors
for students in primary and secondary education[3]

Risk factor	Weights for Primary schools (w_1)	Weights for Secondary schools (w_2)
Socio-economic status of the student	0.3	0.2
Absenteeism	0.1	0.2
Academic achievement	0.1	0.1
Behaviour	0.15	0.1
Use of social assistance	0.1	0.1
Other risk factors	0.05	0.15

In order to represent the weight w_i as a percentage influence onto the composite risk index (*RI*), we ensure that Σw_i is equal to 1 (1 represents 100% influence), i.e. RI = $w_1 \cdot a_1 + w_2 \cdot a_2 + ... + w_n \cdot a_n$ (RI = $\Sigma_{i=1}^{n} w_i \cdot a_i$) (1) where RI is the desired composite index, a_i represents the various criteria normalised to the range of [0, 1] while $\Sigma_{i=1}^{n} w_i = 1$ (Jovanović, 2017). If the RI is higher than 60, this means that the student is at a very high dropout risk, and the index below 30 implies a student who is not at dropout risk (Jovanović et al., 2016). Also, the student for whom the class teacher estimates the highest degree (Level 1) within any risk factor is treated as a student at risk of dropping out, regardless of the numerical index of risk (see Appendix 1).

As for the metric characteristics of the *Instrument for identification of students at risk of dropping out*, it is important to underline that, bearing in mind all the characteristics of the distribution of the RI (for the sample of students from 10 project schools), the instrument serves its purpose – it is highly sensitive and points to students who are at risk of school dropout with great precision (Table 2). The frequency distribution represents the right part of the normal distribution, which testifies about higher sensitivity of the instrument for the highest level of risk.

Table 2. Characteristics of risk index distribution

Risk Index – distribution		Percentile of risk index	Score of Risk Index	Number of students below RI score
N	5884	40 percentile	6	2375
Arithmetic mean	18.38	50 percentile	11	2962
St. deviation	18.94	60 percentile	17	3552
Skewness	1.42	70 percentile	24	4153
St. error for skewness	0.032	80 percentile	32	4721
Kurtosis	1.71	90 percentile	46	5318
St. error for kurtosis	0.064	95 percentile	59	5593

3　The impact of socio-economic status of secondary school students in the risk index has lower weights, because these students have reached the secondary school where the impact of socio-economic status is lower while the impact of other risk factors increases. The critical effect of very low socio-economic status has more impact in primary schools and leads to decreased enrolment of the students with the lowest socio-economic status to secondary school.

The predetermined risk index of 60 very precisely covers 5% of students (N = 309) who are at very high risk of dropping out. The Kolmogorov-Smirnov test of the normal distribution (Z = 12.37; p <0.000) indicates that the distribution deviates from the normal distribution, which is the desired outcome of the created instrument to identify students at risk of dropping out.

After the teachers' assessment of risk factors that affect students, cluster analysis was conducted in order to gain insight into dynamics of the interaction of factors and their joint influence on students. The K-cluster analysis gave a solution with 7 clusters (groups) with the highest F ratio on the multivariate analysis of variance (F = 162, p <0.001, Wilks' λ = 0.014, partial η^2 = 0.51). The means for each risk factor for each combination (group) of risk factors are provided in Table 3.

Table 3. Centroids for each risk factor
for each combination (group) of risk factors

Dropout risk factors	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
Socio-economic status	2.98	2.48	1.97	2.30	3.53	1.98	3.88
Absenteeism	4.13	1.30	3.32	4.43	2.19	1.37	3.43
Academic achievement	3.80	2.50	3.19	4.09	2.33	1.42	1.43
Behaviour	4.56	4.39	2.70	4.72	2.28	1.83	4.04
Use of social assistance	3.79	3.15	2.33	1.21	4.50	2.05	4.72
Peer acceptance	4.31	4.34	3.02	4.76	3.88	2.36	4.73
Other risk factors	1.18	3.59	3.17	4.65	1.60	1.68	4.59
N	108	161	125	112	134	95	253

(5=the weakest influence; 1=the strongest influence)

After the clusters had been identified, the Risk Index was calculated for each of them. A graphic description of the RI for all clusters is given in Chart 1. The chart also presents the labels of all clusters which are indicative of their characteristics.

Regarding the individual measures of support to students at risk of dropping out, the School Dropout Prevention Team (DPT) drafts an IPDP for each of the identified students by using the guidelines for individual support based on cluster analysis (see Veselinović et al., 2016). It is recommended that the coordinator of a student's IPDP should be a teacher with whom the student has the best relationship (according to the DPT's estimation). The IPDP consists of the measures that are individualised to the greatest extent for the identified student and also includes the steps that would lead to higher levels of the individualisation of measures. The DPT was instructed that the development of the IPDP must be based on the data about students collected for this purpose – either the already existing data or data collected through additional testing and assessments – since data-informed IPDPs are better adjusted to students' needs and address the risk factors more efficiently, which should lead to desirable results.

Chart 1. Dropout risk index for different clusters
and the description of clusters
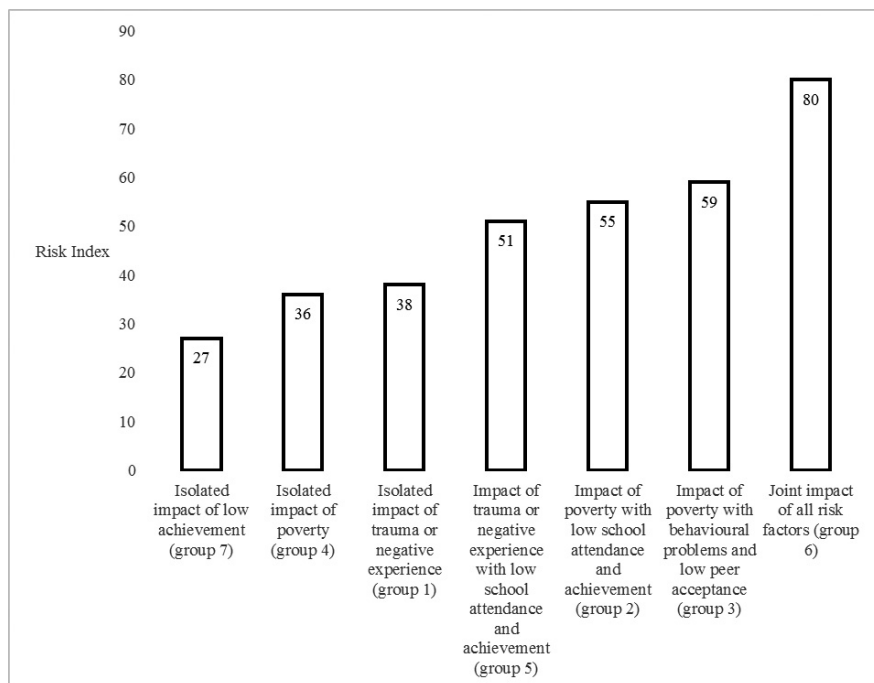
Aims

This paper is focused on the evaluation of the effects of IPDPs provided within the DPM and their contribution to reducing the dropout rate at school level. With these aims, four variables were chosen as indicators of the IPDP's measures effectiveness (dropout rate, absenteeism, achievements, and grade repetition), as well as a set of process-oriented (qualitative) indicators of the process of support provision.

Sample. The first phase of sampling of schools was a selection of the municipalities according to multiple criteria such as poverty, number of schools and students etc. The selection of schools from the identified municipalities was also guided by multiple criteria (e.g. the number of students from vulnerable groups, the motivation of school for the participation in the project, understanding of dropout as a phenomenon etc.). Finally, six vocational and four primary schools were selected from seven municipalities (see Jovanović et al., 2016). The schools used the *Instrument for identification of students at dropout risk* in order to identify at-risk students by calculating their RI. This means that every head teacher assessed his/her students with the instrument (N=5,883). During the first administration of the instrument, 309 students were identified as the students with the highest risk of dropout

(RI>60), but during the following two years of the project implementation, the IPDPs were developed for totally 450 students (see Jovanović et al., 2016), due to the new students at risk and the termination of implementation of some of the IPDPs during the project (decrease of dropout risk factors, the student completed school, etc.).

Methodology of evaluation of individual support measures

Due to the fact that the identification of students at dropout risk was not conducted in any of the pilot schools before the beginning of project intervention, it was not possible to know the exact dropout rate of at-risk students before project implementation nor was it possible to follow the pretest-posttest design with a control group, or any other design that requires measurements before the implementation of the intervention. However, multiple measurements during project implementation were conducted and, as mentioned, the effectiveness of the measures within IPDPs was assessed by the following indicators: 1) dropout rate, 2) absenteeism, 3) achievements, and 4) grade repetition, i.e. the difference between two measurement points (in the first and the last semester of the project). In order to obtain full insight into the effectiveness of individual support measures, process-oriented evaluation, i.e. an evaluation of the quality of individual support measures, was also designed (Jovanović et al., 2016).

Therefore, in the evaluation of individual support measures within IPDPs, and in the evaluation of the process of their implementation, the categorisation and quantification of the following aspects of support described in an IPDP were conducted: 1) the types of support provided, 2) the sources of support, and 3) the overall quality of IPDP. Each of these aspects was further divided into categories. Therefore, one of the four types of support could be attributed to a measure: a) support in learning during regular lessons, b) support in learning outside the regular lesson time, c) socio-emotional support (e.g. increasing peer acceptance through the inclusion of students in extracurricular activities), or d) material support. Further, the sources of support were divided according to the support providers, i.e. the support provided by: a) teachers, b) professional support services, c) peers, d) parents, and 5) an external institution – regardless of the quantity of support. In addition, the number of measures in each category of the three aspects was calculated. The last aspect was the overall quality of the IPDP assessed by the expert team. The quality of IPDPs was assessed by three criteria on a 10-point scale: a) compliance with the specific needs of individual students, b) the degree of concretisation of the proposed measures, and c) the feasibility of the measures. The overall IPDP quality was calculated as the average of three scores.

The process of the analysis considered calculating the changes on four indicator variables (dropout rate, absenteeism, achievements, and grade repetition) between two time points – the first semester of the

project implementation and the last. Besides this, the qualitative aspects of individualised measures were quantified – the frequency of their occurrence across IPDPs was calculated. Additionally, the frequency of these aspects was correlated with the Risk Index, and the differences between groups of factors (clusters) on qualitative aspects were estimated.

Results

Dropout rate. Out of the 450 students for whom IPDPs were developed, only 25 dropped out, accounting for 5% of the students with IPDPs. Although at-risk students were identified at the beginning of the intervention, it was impossible to calculate the exact potential to decrease the dropout rate. However, bearing in mind that the identified students were under very high risk of dropping out, i.e. influenced by all or almost all risk factors, these results suggest that the school can have a preventive effect on dropout even when risk factors of high intensity, such as extreme poverty, are in place. Another finding that implies high effectiveness of IPDPs is that the dropout rate at school level was decreased by 66% – from 222 students dropping out in the first year of the project to 75 students after the project (Čekić Marković, Radišić, Jovanović & Ranković, 2017), while the majority of students who had dropped out during the project (78% of dropouts) were the students who did not have IPDPs. Those students were not initially identified as students at high dropout risk, but according to schools' reports, some of the dropout risk factors started to affect them unexpectedly (e.g. sudden unemployment of the parent, teen pregnancy, etc.), after the identification at the school level at the beginning of the project.

Absenteeism. Looking at the data on the absence of students who were under individualised support measures, we noticed that the number of excused absences for students under IPDPs increased at the end of implementation of the project (with 109 absences per student in the first semester in the school year 2014/15 to 152 absences in the second half of 2015/16), while the number of unexcused absences remained similar. School reports suggest that this might be due to the fact that a significantly larger number of students left their place of residence, because of the refugee crisis that erupted during the project and, in most cases, sought asylum abroad (Čekić Marković et al., 2017). Therefore, further analysis that was carried out compared absences only for those students who did not leave their place of residence. The results of this analysis have shown that the number of excused absences had remained similar, but that the number of unexcused absences was reduced significantly (with 41 absences per semester to 18 absences). Many of these students were absent due to seasonal work with their families or for other family-related reasons, and, therefore, had more absences than an average student. The decrease of unexcused absences reflects the effects of individual support measures and the established trust between the schools and students, while the unchanged number of excused

absences indicates the influence of systemic factors on school attendance, such as poverty (seasonal work, family assistance, etc.).

Academic achievements of students with the IPDP also improved when the first semester is compared to the last semester of the project implementation. At the end of the first semester of 2014/15, the average achievement was very low (1.29), but it increased by the end of the last semester (1.91). Although achievements at both time points are extremely low, there has been a progress.

The rate of grade repetition. Prior to the project implementation and development of the IPDPs, the grade repetition rate for the students at the highest risk of dropping out was extremely high – 26.2% of them repeated a grade. At the end of the project and implementation of the activities within IPDPs, only 2.35% of students repeated a grade, while 17.7% of these students were sent to repeat exams.

Support provision process. On the average, one IPDP contains slightly more than 9 different support measures (M=9.21), which at first glance may seem insufficient, but when such support measures are properly directed towards the needs of students, they proved to be effective. However, the IPDPs are very much different in the number of measures (high standard deviation is presented by vertical lines in Chart 2), and the number of support measures varies from 3 to 15 per IPDP for two-thirds of students.

Chart 2. Characteristics of IPDPs for all students
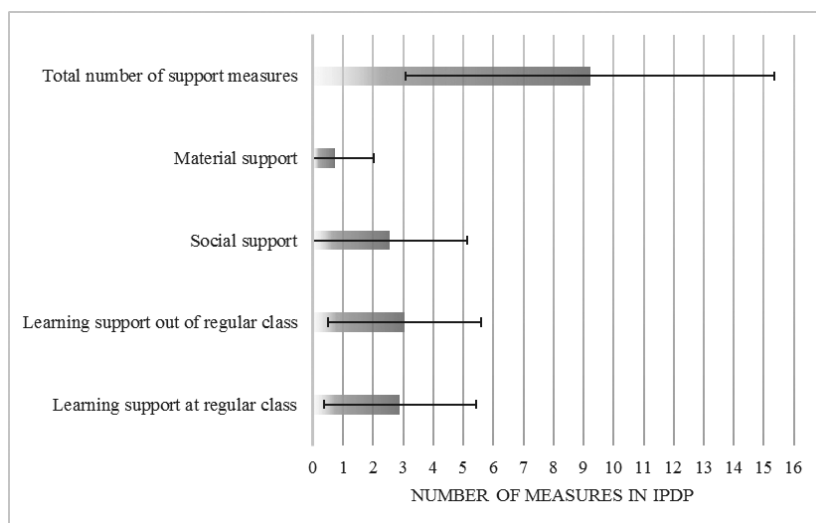
The most frequent measure is the support in learning provided outside the regular classes (e.g. planned attendance of remedial classes, peer support in learning at home or in school, additional support of teachers in preparing students for a specific subject, creating study plans and strengthening the motivational

aspects of work in school in relation to individual subjects), followed by the support in learning during regular classes, which consists of the individualisation of teaching, tailored assessment and examination of students, socio-emotional support by teachers, etc. Material support is the least frequent because of the reduced capacity of schools in this aspect. However, such efforts were still present and obviously successful (providing clothing, footwear, free meals, school supplies and textbooks). Social support is rather frequent too, but the higher standard deviation suggests that some schools did not do much to increase the sense of acceptance and wellbeing of students through planned activities.

As for the sources of support measures stated in IPDPs, the teachers and school personnel were the most common source of support for the students with the developed IPDP. The teachers were a source of support in 94.3% of IPDPs, and professional associates in 86% of IPDPs. Peer support was also well represented (77%), while parents (59.1%) and other institutions (e.g. local NGOs or the Centre for Social Work with 33.4%) were less common (Chart 3). On the average, each IPDP encompassed 3.5 different sources of support.

Chart 3. Sources of support in IPDPs
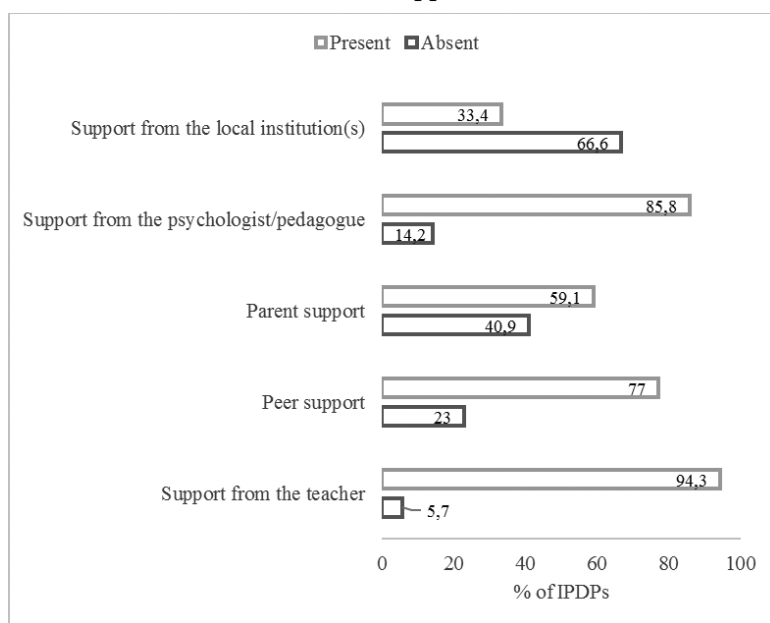
According to the quality assessment of IPDPs, the average quality is 5.79 (min=1, max=10, SD=2.05). The purpose of this information was not to give a final judgment on the quality of the IPDP, but rather to be a formative support in further improvement of IPDPs and their implementation in the educational system. The estimated quality of IPDPs is in high correlation with the number of measures stated within the IPDP (r=0.46; p<0.01), which might suggest that teachers who were motivated enough to carefully and

systematically develop the IPDP were more detailed and creative in choosing support measures – hence the measures are more frequent. The quality of the IPDP is not correlated with the risk index (r=0.03; p>0.05), which probably means that motivated teachers will provide quality support to each of the students at risk, regardless of the students' level of vulnerability.

There is a moderate to strong correlation between the risk of dropping out and the number of support measures within the IPDP (r = 0.423; p <0.01). Such a correlation can be explained by the insights gained through focus group discussions with teachers – when teachers had acquired relevant information about students through the process of the IPDP development, they made greater efforts to increase support to those students who needed it most (Jovanović et al., 2016). These results are rather encouraging.

The comparison of different types of support measures across clusters of risk factors speaks in favour of schools adapting the type of support to the combination of risk factors (Chart 4). All differences are statistically significant (p <0.01).

Chart 4. Types of support depending
on the combination of risk factors
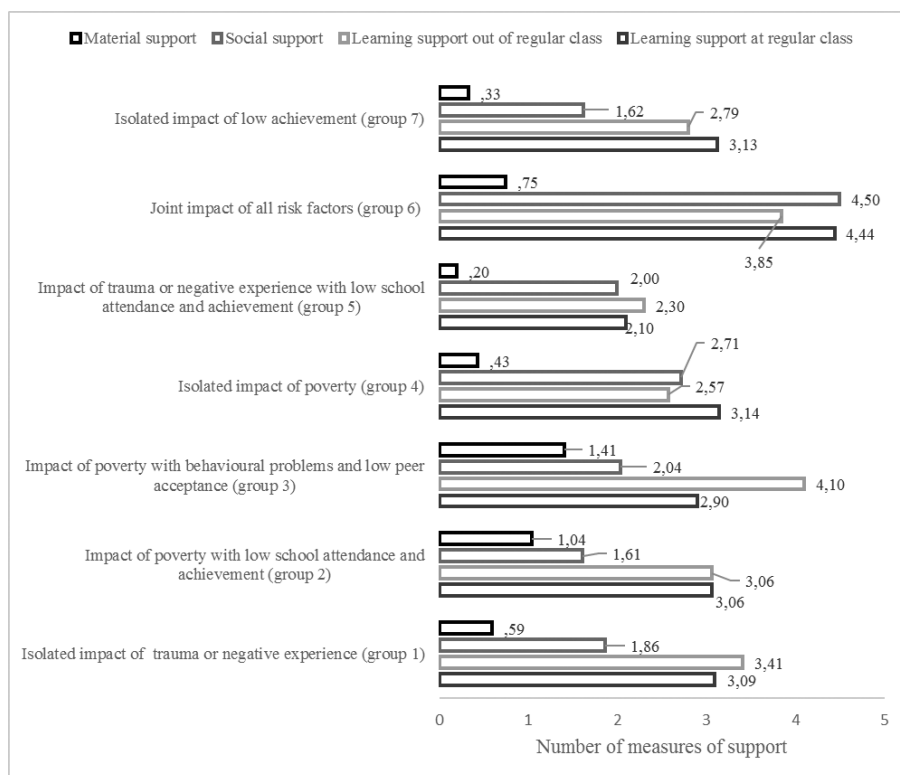
For example, the IPDPs for students under the influence of all risk factors with the highest intensity (a group of risk factors 6) contained the largest

number of support measures of different types. Material support and remedial teaching were the most frequent for a group of risk factors 3, in which the low socio-economic status was associated with non-acceptance and behavioural problems. Support in learning during regular classes was well adjusted to students' needs and was the most frequently planned measure for the students under the influence of all risk factors (group of risk factors 6), the students with low confidence and negative attitudes towards school, and the students that failed in school (group of risk factors 7). Social support was the greatest where it was most needed (group of risk factors 6) and slightly higher where there was an isolated impact of poverty (a group of risk factors 4).

Discussion and conclusion

The purpose of this paper was to evaluate the effectiveness of individualised support measures provided to students at risk of dropping out in 10 project schools (in 7 vulnerable municipalities), i.e. the effectiveness of the IPDPs. The evaluation was done in several steps. Firstly, the outcome-oriented indicators were chosen and measured. The key indicators were the dropout rate, absenteeism, achievements, and grade repetition, i.e. the differences on these indicators between two measurements – the first and the last semester of project implementation. Additionally, the qualitative evaluation was conducted through the analysis of IPDPs. Support measures contained in IPDPs were categorised according to three criteria: the type of support, the source of support, and an overall quality of measures. After these, the process-oriented indicators were quantified; their correlation with outcome indicators was examined, as well as their distribution across combinations of different risk factors.

One of the main limitations of this study is that it is impossible to have precise baseline data on the students under risk, identified by the teachers through the *Instrument for identification of students*, because the process of identification is inextricably linked with individualised support and better teacher perceptions about students at risk. The other limitation, in relation with the previous one, is the non-existence of the control group of equivalent schools for comparison of data at the school level. This was compensated by the fact that the data before the intervention had been collected for a longer period than it would be the case in a classical experimental draft. Biased sampling that was used in this study to some extent prevents the standard use of statistical error. However, small effects in changes estimating the impact indicators should be even greater in the general population of schools who are at lower dropout risk and have more supportive local environment for their work. This ensures the feasibility of the practical implication of the research and the recommended educational policy.

The results have demonstrated the effectiveness of the individualised support measures. There were significant changes on three out of four outcome indicators at school level, for all students. The dropout rate, absenteeism, and grade repetition decreased (by 66%, by 30%, and by 23%, respectively), unlike

students' achievements, where the increase was fairly small (however, a slight change was recorded after all). These results are very encouraging since they demonstrate how systemic and carefully planned efforts at school level (that are adjusted to students' needs) can help combat even the most persistent risk factors (such as poverty) and prevent dropout in a significantly large number of cases. Although achievements remained to be improved, we claim that individualised support measures were very effective since other preconditions for academic progress have been met – students attended school more frequently, they moved from one grade to another and graduated from primary school more often. Besides significant changes on key indicators, other results that demonstrated desirable effects of individualised support measures include the percentage of students with the IPDP that dropped out (only 5 % of the IPDP students) and percentage of dropouts without the IPDP (78%). Hence, we are prone to believe that support measures, planned and implemented in accordance with individual student's needs, scaffold social and cognitive development better (Cole, 1996; Rogoff, 2003; Vygotsky, 1993; Wertsch, 1991), therefore opening up space for academic progress and improved wellbeing (e.g. Felner et al., 2007; Slavin, Madden, & Leavy, 1984).

The main factor of the effectiveness of individualised support is the correspondence between children's needs and the created support measures, while without the adequate provision within the classroom and raising the child achievements and self-confidence (Mitchell, 2014; 2017) the dropout issue cannot be adequately addressed. It is very hard to assess the effectiveness of a particular IPDP without a detailed knowledge about the particular student, which can often be far from the research capacity and scope. Also, the formal aspects of the IPDP do not guarantee the quality of the activities carried out with students, and vice versa. The most important information pointing to the effectiveness of these measures is a very low dropout rate of these students at the end of the project, bearing in mind very difficult conditions in which they live and develop. The other part of the analysis proved that few other characteristics of IPDPs can still be important in the quality assessment of individual support measures and that some kind of "internal consistency" of the IPDP must exist as an indicator of quality assurance of individualised support measures.

The results that prove the effectiveness and quality of these measures were derived from the qualitative analysis of the IPDPs as well as the quantitative analysis of the qualitative data contained in the IPDPs. The qualitative and mixed-method approach to the analysis of the IPDPs showed that schools adjusted support measures according to the needs of students and the combination of (groups of) risk factors affecting the students. A great variety of types and sources of support were recorded across IPDPs. Generally, the number of support measures grew as the intensity and number of risk factors affecting students increased. Moreover, the quality of IPDPs was higher as the number of support measures contained in them grew. The result in favour of the quality process of support provision is that types and sources of support

differed across students affected by different combinations of risk factors. Another potential cause of effectiveness of measures is the length of their implementation. Some other research related to dropout prevention suggests that at least a two-year long implementation of individualised measures may result in lower absenteeism, higher student participation (as perceived by teachers), and higher parental support (Lehr, Sinclair & Christenson, 2004).

The school and teacher motivation proved to be of crucial importance in making effective individual support. Not only is this conclusion supported by the high variability and number of support measures in the IPDPs, and the correlation between the estimated quality of the IPDPs with the number of support measures in them, but also by the findings of a narrative analysis of parents, students and teachers, as well as the effectiveness of the DPM on the whole (Jovanović et al., 2016). Also, the DPM had an influence on some standards of educational quality measured by the local pedagogical advisors, especially for individualised support provision (Jovanović et al., 2016, p. 102), which can be an additional argument for the validity of the methodology and results presented in this paper.

These findings also imply that guided instruction to the schools, even in an area that needs high individualisation of measures and school autonomy in making decisions, could be effective. Having in mind that a guided intervention minimised the effects of teachers' competence and provided important help to the teachers who were less experienced in the planning and provision of support, the results demonstrated that school is far more able to accomplish dropout prevention when the school ethos is characterised by cooperation, exchange, trust and horizontal learning. This stands true even in schools where the risk factors were numerous and their influence was very strong (e.g. poverty – Felner et al., 2007; Lee & Burkam, 2003). The introduction of the new models of school functioning in other areas, for example, the models aiming at prevention and intervention in cases of disruptive behaviour, also proved to lead to desirable outcomes when school climate, systems and procedures are altered (Bradshaw, Mitchell & Leaf, 2010).

Other findings from Serbia have shown that individualised support can be a transformative experience for the improvement of everyday teaching practices and that a school plan for individual support can be a mediating artefact (Engeström, 2001; Engeström & Sannino, 2010; Kovač-Cerović, Jovanović & Pavlović Babić, 2016), which is important if we think of the IPDP as a mediating tool (Kozulin & Presseisen, 1995). Such a framework is rather important having in mind that many countries raised their overall education quality (assessed by various tests of competence such as PISA tests) through raising the equity of education system (Baucal, 2012; Green, Preston & Janmaat, 2006; OECD, 2003; OECD, 2014). More importantly, decreasing the influence of the socio-economic status on students' achievements in this way can have a positive impact on the entire society and economic development (Hanushek & Woessman, 2008). Thus, the dropout prevention and individualised support provision can influence the overall quality of education, especially if the intervention programmes can compensate the

negative effects of low socio-economic status through the provision of enough reading and learning resources (Jovanović, 2016). The schools that are willing to provide support to all students, to create an inclusive climate and to nurture horizontal learning, enable more progress and motivation for their students. Additionally, individual support provision can be a crucial step towards a more equitable and inclusive school, where achievements and the wellbeing of students are increasing (Creemers & Kyriakides, 2008; Jovanović & Baucal, 2016; Jovanović, 2014; 2015; Jovanović et al., 2016; Kovač Cerović, Pavlović Babić, Jokić, Jovanović & Jovanović, 2016; Kovač Cerović, Pavlović Babić & Jovanović, 2014; Pavlović Babić, Jovanović & Jovanović, 2014; Scheerens, 2000). All this means that the results recommend the use of the IPDPs in the Serbian educational system, as well as the strengthening of the schools for the implementation of the IPDPs (e.g. through the broadening of the existing individual education plan – IEP) in order to make schools more sensitive for providing support to the poorest children.

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Effectiveness of Individualised Support Measures in Dropout Prevention Model (DPM) in Serbian Schools

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Cilj ovog rada je procena efektivnosti individualnih mera podrške u okviru Modela za sprečavanje osipanja učenika (MSO), nakon dve godine njegovog sprovođenja u 10 pilot škola u sedam najugroženijih opština u Srbiji. U okviru identifikacije učenika u riziku od osipanja u okviru MSO-a, izračunat je indeks rizika od osipanja za svakog učenika (IR) a potom su razvijani individualni planovi prevencije osipanja (IPPO) kao sredstvo za održivo planiranje i pružanje podrške učenicima pod rizikom. Uzorak je činilo 450 učenika sa IPPO od ukupno 5884 učenika za koje je procenjivan IR. Evaluacija individualnih mera podrške je sprovedena kroz kvazi-eksperimentalni dizajn, sa merenjima u različitim vremenskim tačkama, kao i kroz kvalitativnu analizu strukturnih aspekata IPPO-ova koja je ispitivala odnos vrste mera podrške, faktora rizika koji deluju na učenika, IR i ključnih indikatora. Rezultati pokazuju željene efekte individualizovanih mera podrške na sprečavanje osipanja. *Instrument za identifikaciju učenika pod rizikom od osipanja*, pokazao je visoku osetljivost za učenike pod veoma visokim rizikom od osipanja. Samo 5% učenika pod veoma visokim rizikom od osipanja za koje je razvijan IPPO, napustio je školu tokom dve godine realizacije MSO. Dalja analiza odnosa između različitih vrsti mera podrške u okviru IPPO pokazala je zadovoljavajuću prilagođenost ovih mera različitim vrstama faktora rizika. Škole su pokazale da imaju kapacitete da preventivno deluju i smanje uticaj faktora rizika iz neposrednog okruženja učenika, kao što je to izraženo siromaštvo. Predstavljeni rezultati podržavaju dalje širenje IPPO-ova u okviru MSO ka drugim školama u našem obrazovnom sistemu.

Ključne reči: sprečavanje osipanja, faktori rizika od osipanja, mere individualne podrške, Individualni planovi prevencije osipanja, pravednost

Appendix 1. The description of Risk Intensity in the Instrument for Identification of Students at Dropout Risk

	Level 1	Level 2	Level 3	Level 4	Level 5
Socio-economic status	The student lives without elementary living conditions: in unhygienic settlements, without electricity and water. Both parents are unemployed or one of the parents is employed with the poorly paid job.	The student comes from a region where electricity and water are available. Both parents are unemployed or one of the parents is employed with the poorly paid job (under the poverty line)[3].	The student whose family is at poverty line and/or receiving assistance from the wider family or a family member has a regular income.	The student of average socio-economic status.	The student of higher socio-economic status.
Absenteeism	The student was not present at 30% or more of the total number of school classes.	The student was not present at 20% to 30% of the total number of school classes.	The student was not present at 10% to 20% of the total number of school classes.	The student was not present at 5% to 10% of the total number of school classes.	The student was not present at 5% or less of the total number of school classes.
Academic achievement	The student has the lowest mark in 5 or more subjects (in any of the classification periods).	The student has the lowest mark in 3 or 4 subjects (in any of the classification periods).	The student has the lowest mark in 1 or 2 subjects.	In the majority of subjects the student has mainly passing (2) marks.	The student has a similar or higher achievement in relation to the school average.
Behaviour	Some of the behavioural problems are so severe that they interfere with the normal functioning of the student within the school and extracurricular contexts: 1) resistance to the authorities (e.g. conflict with teachers); 2) peer violence; 3) antisocial behaviour (refusing to socialise with peers); 4) addiction (alcoholism, drug addiction); 5) delinquency.	The problems in behaviour from these five categories are expressed, but the student is successful in certain segments of his/her behaviour (socialising, achievement, attendance and behaviour in classes, etc.).	Behavioural problems are present, but they are of low intensity and do not interfere with the normal functioning of the child in and outside the school.	Some behavioural problems used to be present, but they are not anymore.	The student has never had behavioural problems.

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Use of social assistance[4]	The student is eligible to be a beneficiary of social assistance, but the family does not receive aid for some reason.	The student is eligible to be a beneficiary of social assistance and at present the procedure of getting the aid is going on.	The student is from a family eligible to be a beneficiary of social assistance and is a user of social assistance or lives at poverty line.	The student was a beneficiary of social assistance, but ceased to be, because there is no more need for that.	The student has never had the need to be a beneficiary of the social assistance.
Peer Acceptance	The acceptance of the student in school is not satisfactory and two out of the following three statements are correct: 1) does not have a friend; 2) is a target of bullying; 3) social interaction is within a very small and closed group (e.g. ghettoisation, group of two Roma students)	The acceptance of the student in school is not satisfactory and one out of the following three statements are correct: 1) does not have a friend; 2) is a target of bullying; 3) social interaction is within a very small and closed group (e.g. ghettoisation, group of two Roma students)	The student is more or less accepted in school, but some of the problems from the previous two categories can be recognised.	The student's acceptance in school is satisfactory, but there are some problems.	The student is accepted in school and none of the stated problems are present.
Other risk factors	There are one or more other risk factors, such as abuse and neglect, teen pregnancy, repeating grades, exile, incomplete families, experienced trauma and the like, and their effect on the student is strong and visible.	Some of the risk factors are expressed, such as abuse and neglect, teen pregnancy, exile, incomplete families, experienced trauma and the like. Their effect is moderate, but there is a possibility of their influencing the interruption of schooling.	The effect of these risk factors exists, but now on a small scale.	Risk factors were active at some point in the student's life, but at the current moment are not present.	These risk factors of dropping out have never existed in the student's life.

(Source: Jovanović et al., 2016)

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4 According to the data of the Statistical Office of the Republic of Serbia from 2012, the relative line of poverty per household is 13,680 RSD (≈123 EUR, currency rate from 2012) for a one member family, and for a four-member family with two young students aged 14 it is 28,728 RSD (≈261 EUR, currency rate from 2012); 24.6% of households was at poverty risk at that time (The Government of Republic of Serbia, 2014)

5 **Reminder. Who acquires the conditions to become a user of the system of social protection by the Serbian law?** A minor without (or at risk of losing) parental care; a minor whose parents argue over ways of performing parental rights; a minor with disabilities (physical, intellectual, speech-language, socio-emotional); a minor who is facing difficulties due to the abuse of alcohol, drugs or other intoxicants; a minor at risk of abuse, neglect and domestic violence; an adult person with disabilities (physical, intellectual, sensory, communication difficulties); an adult who is at risk of abuse, neglect and domestic violence; an adult person who faces: difficulties due to disturbed relations in the family, addictions to alcohol, drugs and other intoxicants. **Who gains the right to financial support?** Individuals who do not receive a monthly income higher than 6,050 dinars (Law on the Social Protection, 2011).