

The Use of Pedagogical Monitoring to Assess the Educational Potential of Schools

Nataliy Abakumova

National Research Tomsk State University and Institute of Educational Systems Development, Tomsk, Russia

Abstract: This study aims to identify the index of efficiency of school innovative activity which can be used to evaluate the institution educational potential with the help of pedagogical monitoring. Pedagogical monitoring is presented as a high humanitarian technology used for detecting educational results in terms of estimating the new quality of education and assessing the effectiveness of innovations. This study presents the results of the analysis of 304 schools introducing innovative educational programs during the period 2006-2012 that took part in the financial reward competition among the teams of regional state and municipal educational institutions of Tomsk region. These results were recorded to assess the state and the level of the use of pedagogical monitoring in educational institutions. Simulation is used as the main research method. This work considers the construction of a model of pedagogical monitoring for assessing the effectiveness of implementation of innovations in schools. The study also reveals the results of testing of pedagogical monitoring model in schools of Tomsk region during 2007-2012 school years. The conclusion of the study presents the assessment of the efficiency index of the pedagogical monitoring for the educational potential of schools.

Key words: School innovative activity • Tomsk region • Pedagogical monitoring

INTRODUCTION

The question of the content of pedagogical monitoring, forms and methods of its organization, analysis and summary of the results still remains open. The researchers haven't paid adequate attention to the organization of the pedagogical monitoring in an educational institution (EI) implementing innovations. The use of monitoring in the education system ensures objectivity, timeliness and accuracy of data which in turn allow to timely and adequately respond to certain changes of the examined object. This study considers pedagogical monitoring as a high humanitarian technology detecting such educational results which represent the new quality of education and allow us to assess the effectiveness of innovations [1].

The scientific hypothesis of the research is based on the analysis of state, trends and development regularities of the efficiency of innovations and is included in the system of theoretical statements according to which pedagogical monitoring is considered to be the most

important imperative for increasing the efficient use of innovations as it creates an information base for making sound management decisions in the studied area. The rationale of the relationship between pedagogical monitoring of innovations and educational institution management arising from its nature and the need to expand the boundaries and the functional content of pedagogical monitoring due to the development of the innovative processes of technification and humanization and implementation of modern information technologies have determined the vector of its transformation towards creating conditions for the assessment of efficiency of innovations and EI activity.

A number of challenges were solved to achieve this goal: the establishment of concept and content of pedagogical monitoring of innovations on the basis of the critical analysis and synthesis of the theoretical concepts existing in domestic and foreign literature, definition of its place and role in the educational institution, development and testing of the system of indexes for pedagogical monitoring of innovations.

Table 1: The state of pedagogical monitoring and management of innovations in schools

No.	Specification	Implementation per year (%)					
		2006	2007	2008	2010	2011	2012
1	Availability of pedagogical monitoring of innovations as a system	—	—	—	12	19	23
2	Availability of analysis of innovation indexes of EI	83	89	94	100	100	100
3	Availability of analyses of indexes of innovations of EI	4	6	18	72	83	100
4	Availability of elements of management of innovations	44	52	49	67	85	92
5	Availability of efficiency control of innovations	—	—	—	12	15	19
6	Availability of management of innovations as a system	—	—	—	12	19	23

It is essential that the role of pedagogical monitoring should perfectly "fit" in the process of innovation management with consideration for the subject of management towards which the pedagogical monitoring is directed and its informational background should provide the process with relevant information used in the system of education as educational potential of EI and allowing to solve tasks with maximum efficiency. The purpose of pedagogical monitoring of innovations is considered to be the information support of management of innovations in the school. On the one hand, such pedagogical monitoring of innovations should be regarded as relatively isolated system created for its own purpose, however, on the other hand, it is considered to be part of the overall management system of innovative practices in EI which means that monitoring is created as an additional system implementing a set of functions and enhancing the effectiveness of innovations, productivity and competitiveness of schools. According to domestic and foreign literature the educational potential of schools is understood as a series of organizational, methodic, professional and other components which enable the assessment of the educational potential in terms of quality of education, its level, indexes of educational and cultural sphere development [2-5]. Due to considering innovations as an integral component of the educational potential of the school, it has become possible to define the educational potential of the school through the assessment of formation of pedagogical monitoring system and monitoring model indexes.

The Main Part: This study has shown that despite the fact that the typology of innovations is well studied, the vast majority of educational institutions either do not use them or use occasionally, not systemic [6-9]. Analysis of the state of pedagogical monitoring and management of innovations was conducted among schools introducing innovative educational programs that participated in the competitive selection of teams of regional state and municipal educational institutions of Tomsk region for

financial reward. During the period 2006-2012 years (excluding the year 2009 when the competition was not conducted) the competitive materials of 304 schools were analyzed. The results of statistical analysis of these data are shown in Table 1.

The results of the analysis have shown the presence of system of pedagogical monitoring in EI which is considered to be significant factor in the structure of assessment of the educational potential of schools. Significant changes in the manifestation of innovations, their evaluation, systematization and management took place in 2010. This is associated with significant changes in the organization of competitive materials examination such as the need of highlighting of both the efficiency indexes and the system of monitoring in model representation and their management (the expert cards of contest are presented here-<http://rcro.tomsk.ru/wp-content/uploads/2011/03/eekspertnyie-kartyi-2011.zip>). It is necessary to indicate the relationship of indexes: availability of the pedagogical monitoring as a system, efficiency control of innovations and management of innovations as a system. However, as the analysis has shown the barrier to innovation management turns out to be the lack of pedagogical monitoring of innovations and insufficient information support of such management. According to the analysis of competitive materials of schools, management of innovations is usually reduced to the annual assessment of EI efficiency in general and sometimes it is also reduced to the its separate directions. Due to the fact that the control of separate innovations is not conducted, the management is terminated before reaching the executive level where educational processes and teaching practice are implemented.

During the period of 2007-2012 pedagogical monitoring was organized in Zaozernaya secondary school with the advanced study of specific subjects No. 16 in Tomsk on the basis of the secondary school No. 196 of closed administrative territorial formation of Severusk. The main task of pedagogical monitoring of innovations in the educational institution was the investigation of the

effectiveness of innovations in education that can serve as a component of the assessment of the educational potential of the school. The meta-subject educational results (the formation of general education skills and abilities) and the level of cognitive development of students of various educational institutions are considered to be the subject of pedagogical monitoring. Thus, the goals of innovations of the educational process in EI become the basis for determining the assessment criteria of the quality of education which in turn become the foundation for monitoring conduction: the success of training, the formation of the general education skills and abilities, motivation to learn, the formation of axiological self-determination, professional self-determination, the ability to adapt and interact in team. The building of a monitoring model in the EI assumed:

- The selection of indexes for each criterion on a given analytical line of the monitoring models.
- Determination of methods of index diagnosing.
- Organization of monitoring procedures (timing, forms of result presentation, responsible people).
- Analysis of the results of monitoring.
- Definition of management decision.

The introduction of innovations in the institution educational process makes it necessary to reconsider the current system of education results' monitoring, to plan and to develop a complex system of interactions of all participants in the educational process: during education the teacher presents educational outcomes of students, their educational opportunities' assessment, mannerliness, formation of general education skills and abilities to the pedagogical council in accordance with the terms of the diagnostics. Then the analysis of the statistic materials presented by teachers is carried out and pedagogical strategy and tactics are determined in relation to a particular group of students where the innovation is implemented. Administration analyzes and summarizes the materials of pedagogical councils and on the basis of the analysis identifies trends which in turn become the basis for the prediction of further development. On the basis of the defined prediction the methodological council develops the strategy and tactics of the pedagogical system of EI. The pedagogical council discusses all final monitoring materials and strategies proposed by the methodological council. According to the results of council decisions, professional solutions are adopted and presented in the form of orders for EI.

Thus, the pedagogical monitoring of innovations in educational institution presupposes solving of the following range of challenges:

- Monitoring of the innovation activity development in educational institution.
- The use of results in management in order to correct and prevent the negative versions of transformation.
- Preparation of analytical and reference materials.
- Modeling, forecasting, identification of trends and prospects of innovation activity development in educational institution.

Considering the pedagogical monitoring as a technology that is used by EI to assess the effectiveness of innovation implementation it is necessary to clearly describe the scope of this technique:

- The purpose of pedagogical monitoring is considered to be the identification and the description of the effects and results of innovation implementation in EI with maximum accuracy and reliability using the largest possible number of indexes;
- Pedagogical monitoring is not used to make changes in the process of innovation implementation;
- Pedagogical monitoring can't be used for the research purposes only;
- Due to the principles of scientific character, the results of pedagogical monitoring can be used to make management decisions that are appropriate to the real situation in EI.
- The results of pedagogical monitoring can be used in a strictly limited period of time, their value increases when monitoring results become the basis for dynamic assessments and forecasts.
- Pedagogical monitoring makes it possible to simulate the processes of innovation development in the structure of EI.

When organizing pedagogical monitoring of innovations in EI, the use of indexes is considered to be quite effective. Index is the observable and measurable characteristic of the examined object. In the experimental situation indexes replace, find and represent other characteristics of the examined object which are usually inaccessible to observation.

A set of criteria and indexes used to describe the progress in the implementation of innovations in EI need further systematization. Thus special analytical lines are highlighted to provide the analysis and the most

Table 2: Pedagogical monitoring of innovation efficiency of secondary general education school No. 196

Analytical lines	Criteria	Indexes	School year				
			2007-2008	2008-2009	2009-2010	2010-2011	2011-2012
The level of development of EI graduates' competencies	Communicative skills	1. Ability to speak in public, make a report (%)	82	85	82	90	91
		2. Ability to conduct a dialogue (%)	96	100	93	100	100
		3. Ability to prove one's point of view (%)	93	100	90	100	100
		4. Ability to work with various information sources (%)	100	100	100	100	100
		5. Ability to analyze and interpret different points of view (%)	89	92	94	100	100
	Pragmatic skills	1. Ability to permanent development and self-improvement (%)	78	82	86	87	84
		2. Ability to cooperate, develop partnership (%)	76	77	92	96	81
		3. Ability to act in conflict situations (%)	72	68	80	80	69
		4. Ability to defend one's rights (%)	91	93	89	91	95
	Universal human values	1. The importance of family, continuation of generation (%)	100	100	100	100	100
		2. Perception of importance of healthy lifestyle (%)	83	88	94	100	100
		3. Knowledge and respect for the traditions of your nation (%)	76	80	82	81	86
		4. Discipline (%)	85	89	88	91	90
		5. Responsibility (%)	78	79	76	83	85
	Involvement of parents in educational process of school	The involvement of parents in the educational process	High level (%)	16	18	22	19
Average level (%)			53	54	51	45	47
Low level (%)			31	28	27	36	30
Interaction with parents		High level (%)	16	19	24	22	25
		Average level (%)	56	56	53	49	51
		Low level (%)	28	25	23	29	24
Knowledge of areas of school work		High level (%)	11	14	19	15	19
		Average level (%)	56	57	54	53	55
		Low level (%)	33	29	27	32	26
Inclusion of parents in school arrangements		General teacher-parent meetings (%)	34	36	36	32	35
		Consultations of specialists (%)	23	28	32	19	26
		Trade fairs, exhibitions (%)	29	27	26	24	29
		Visiting open arrangements (lessons, joint activity) (%)	26	24	24	30	36
		Pedagogical councils together with parents (%)	12	16	22	12	21
		Agency of state and public control (%)	3	3	3	3	3
Research and experimental activity of school	Taking the PC courses	% from the total number of teachers	43	39	100	100	29
	Motives for taking PC courses	Referral from school administration (%)	-	-	36	41	9
		Necessity of getting certified (%)	12	10	5	7	7
		Problems with one's professional competence (%)	40	53	56	51	39
		Desire to learn something new (%)	48	37	3	1	45
	Adoption of administrative solutions	Orders	17	24	21	22	24
		Normative documents	2	3	3	2	4
		Development programs	1	1	1	1	1
		Educational programs	4	6	11	17	28
	Participation in synthesis and presentation of innovation experience	City level	16	18	23	30	34
		Regional level	9	10	13	18	15
		Federal level	5	6	9	11	10
		International level	1	1	1	3	4
	Productivity of research and experimental activity	Articles	12	16	15	22	28
		Performances	22	27	27	35	44
Projects		2	3	4	3	4	
Programs		5	3	6	6	7	

Table 3: Pedagogical monitoring of innovation efficiency of Zaozernaya secondary school with advanced study of specific subjects No. 16

Analytical lines	Criteria	Indexes	School year				
			2007-2008	2008-2009	2009-2010	2010-2011	2011-2012
The level of development of El graduates' competencies	Communicative skills	1. Ability to speak in public, make a report (%)	85	87	85	92	94
		2. Ability to conduct a dialogue (%)	98	100	95	100	100
		3. Ability to prove one's point of view (%)	94	100	92	100	100
		4. Ability to work with various information sources (%)	100	100	100	100	100
		5. Ability to analyze and interpret different points of view (%)	92	93	96	100	100
	Pragmatic skills	1. Ability to permanent development and self-improvement (%)	79	84	89	88	96
		2. Ability to cooperate, develop partnership (%)	79	78	94	99	100
		3. Ability to act in conflict situations (%)	76	73	81	82	88
		4. Ability to defend one's rights (%)	90	95	93	92	96
	Universal human values	1. The importance of family, continuation of generation (%)	100	100	100	100	100
		2. Perception of importance of healthy lifestyle (%)	90	84	100	100	98
		3. Knowledge and respect for the traditions of your nation (%)	100	100	96	91	100
		4. Discipline (%)	89	92	90	92	94
		5. Responsibility (%)	81	81	85	86	88
	Involvement of parents in educational process of school	The involvement of parents in the educational process	High level (%)	19	20	23	22
Average level (%)			56	56	52	48	49
Low level (%)			25	24	25	30	26
Interaction with parents		High level (%)	20	23	26	23	29
		Average level (%)	59	58	54	53	54
		Low level (%)	21	19	20	24	17
Knowledge of areas of school work		High level (%)	14	16	20	20	23
		Average level (%)	59	60	56	55	56
		Low level (%)	27	24	24	25	21
Inclusion of parents in school arrangements		General teacher-parent meetings (%)	29	32	33	30	34
		Consultations of specialists (%)	27	32	35	33	36
		Trade fairs, exhibitions (%)	35	33	31	30	34
		Visiting open arrangements (lessons, joint activity) (%)	31	30	34	36	38
		Pedagogical councils together with parents (%)	11	19	17	18	22
		Agency of state and public control (%)	1	1	1	1	1
Research and experimental activity of school	Taking the PC courses	% from the total number of teachers	52	58	100	100	41
	Motives for taking PC courses	Referral from school administration (%)	-	-	22	18	-
		Necessity of getting certified (%)	8	12	7	11	9
		Problems with one's professional competence (%)	16	22	34	28	30
		Desire to learn something new (%)	76	66	59	51	61
	Adoption of administrative solutions	Orders	26	30	32	34	35
		Normative documents	4	5	7	6	8
		Development programs	1	1	1	1	1
		Educational programs	4	6	11	17	28
	Participation in synthesis and presentation of innovation experience	City level	37	42	49	64	72
		Regional level	24	28	29	36	44
		Federal level	13	15	20	23	26
		International level	3	3	4	7	11
	Productivity of research and experimental activity	Articles	17	26	29	34	36
		Performances	52	64	67	71	83
Projects		4	7	13	15	18	
Programs		16	24	27	34	51	

important criteria combinations. Pedagogical monitoring of educational institution innovations is implemented not as a procedure of simple fixing of the result, states and their dynamics according to clear and uniquely defined indexes, but as an analytical procedure. This means:

- Determination of the analytical lines of monitoring defined hypothetically and thus needing to be eventually built up and identified during the study;
- Indexes should be measured not only quantitatively but also qualitatively and even through forecasting and probabilistic issues;
- Different lines of monitoring characterizing the object from different angles and defining its integrity and uniqueness are considered to be complementary. Monitoring is included in the analytical (research) program of EI and therefore the construction of the hypothesis about analytical lines of monitoring is necessary for the qualitative analysis.

Directly the model of monitoring of the EI innovation efficiency is presented in [10]. Pedagogical monitoring of innovation efficiency is based on the hypothesis of subjectivation of EI cultural and educational space which is manifested in such characteristics as the level of development of graduates' competencies, research and experimental activities and the involvement of parents in the educational process.

Since the focus of this study is identified by the possibility of assessment of the educational potential of school, the results of pedagogical monitoring of education institutions will be considered in three analytical lines: 1) "The level of development of EI graduates' competencies" which makes it possible to demonstrate innovative changes in educational process of the institution with maximum quickness; 2) "The involvement of parents in the educational process of EI"; 3) "Research and experimental activity of EI" (Tables 2-3).

The work of secondary general education school No.196 with innovations is defined by very clear organizational structure (opening of specialized classes, representative office of Children's Nuclear Academy, activities arranged together with city-forming enterprises). Thus, it is possible to distinguish high indexes of graduates' "Communication skills" and consistently high indexes of students' pragmatic skills. This indicates the high quality of education received by the graduates of the school which may serve as an estimation of the educational potential of EI. It is necessary to note the

relationship between the index "Involvement of parents in the educational process" and the criterion "Universal human values". This index can be attributed to the level of formation of the cultural and educational environment of the school which is also an integral part of the educational potential of the school.

Polyvariability as the main component of innovation direction of Zaozernaya secondary general education school No.16 points out to higher indexes relative to the criteria "Communicative skills" and "Pragmatic skills". Particular attention should be paid to the index "Knowledge and respect for the traditions of your nation" as educational institution organizes specialized classes (Polish, Ukrainian, etc.) which contributes to the cultural identity of the graduate in the society and ensures consistently high results.

High indexes (100%) of taking the qualification upgrading courses in school No. 196 and Zaozernaya school No. 16 in 2009-11 school years. can be explained by the participation of schools in Complex project of education modernization which has stimulated innovations in EI.

The necessity of providing pedagogical monitoring at the operational, tactical and strategic levels determines its place in the system of management of EI and RSO (Regional system of education). It should be stated that:

- Operational level of pedagogical monitoring of innovations turns out to be the regular measurement of the adopted system of indexes and their processing for the further use in innovation management system and EI. This part of the monitoring is highly integrated into the management processes at the level of educational practice, but relative to information component it is connected to the other levels of management hierarchy as a subsystem creating an information base for making management decisions on the operational management of EI;
- Tactical level of pedagogical monitoring is associated with the development of short-and medium-term plans which are reflected in the criteria of "Adoption of administrative solutions" of analytical line "Research and experimental activity of school". Therefore, this level of monitoring, on the one hand, is related to high and average levels of school management hierarchy and is considered to be an information recipient filling and correcting information base of pedagogical monitoring of innovations and, on the other hand, it enhances the

opportunities of innovation management in EI as it creates the conditions and new channels of direct impact on innovations and teachers and provides feedback to track the results of control action;

- The strategic level of pedagogical monitoring is associated with the programs of school development and increase of the possibility of such control, including regulatory consolidation of direct control action on innovation objects and feedback of management information support. Judging by the five-year monitoring of schools strategic level of pedagogical monitoring as well as tactical one is considered to be the information recipient, filling and correcting its information base in accordance with the adopted program of development of EI.

The system of pedagogical monitoring is integrated into the educational process and management of EI which is achieved by the introduction of additional features and monitoring operations in these processes. In this case there is no need for creating special structural unit for the implementation of pedagogical monitoring of innovations. However, the effectiveness of pedagogical monitoring is achieved through the organization of: 1) the mechanism of innovation monitoring; 2) information component of monitoring with independent system of indexes and criteria; 3) regulatory support of innovation for the effective functioning of the innovation monitoring system; 4) system of monitoring is integrated into the structure, educational processes and management of EI being made virtual through the distribution of tasks and responsibilities of pedagogical monitoring among the EI structures and individual teachers-innovators, the appropriate changes in school regulations (local acts) and the position descriptions for teachers and administrators with appropriate determination of who will do anything, what and when will be done and for what the person will be responsible. Besides additional functions fulfilled by teachers stimulate their work and have direct impact on their salaries.

CONCLUSION

Pedagogical monitoring of innovations should be considered as one of the special and important tools for the assessment of school educational potential. However, its status should be assigned to the highest level as the information from the pedagogical monitoring of innovations is directly used in the formulation of management decisions and actions at the top, middle and

executive levels of management and strategic and tactical levels of pedagogical monitoring are directly related to the highest level of school management hierarchy. This does not contradict the primary objective of pedagogical monitoring of innovations discussed above as this refers to the importance of the innovation influence on school educational potential, its changes and competitive advantages. As a result, it is necessary to provide pedagogical monitoring and innovation management at the operational, tactical and strategic levels.

ACKNOWLEDGEMENT

The work on the topic "Theoretical models of the educational potential development of the general secondary education institutions" has been done as part of the research plan of the Russian Academy of Education (for 2013-2020).

REFERENCES

1. Abakumova, N.N., 2011. The transformation of the concept of monitoring in education // Modern problems of science and education. No. 3; URL: www.science-education.ru/97-4678 (access date: 30.09.2011).
2. Schleicher, A., 2007. Is the Sky the Limit to Educational Performance? In the Proceedings of the Redesigning Pedagogy: Culture, Knowledge and Understanding Conference, Singapore, May 2007// http://conference.nie.edu.sg/2007/paper/papers/KN_AndreasSchleicher.pdf
3. Gilman, D.A., R. Andrew and D.C. Rafferty, 1995. Making Assessment a Meaningful Part of Instruction. Bulletin. National Association of Secondary School Principals. October, 1995, New York, pp: 122.
4. Scriven Michael, 1991. Beyond Formative and Summative Evaluation in Education. In Evaluation and education: At Quarter Century. Ed / M. W. Mc. Laughlin and D. C. Philips.-Chicago, pp: 19-64.
5. TIMSS_2007. International Science Report: Findings from IEA's Trends in International Mathematics and Science Study at the Fourth and Eighth Grades. n URL:http://timss.bc.edu/TIMSS2007/intl_reports.html
6. Adams, Arvil, V., 2012. The Role of skills development in overcoming social disadvantage. The Role of skills development in overcoming social disadvantage Publ, pp: 20.

7. Kett, M., 2012. Skills development for youth living with disabilities in four developing countries. Background paper prepared for the Education for all global monitoring report, pp: 27.
8. Yousif, A.A., 2009. The State and Development of Adult Learning and Education in the Arab States: Regional Synthesis Report. Hamburg, Germany, UNESCO Institute for Lifelong Learning.
9. Anderson, A. and M. Hodgkin, 2010. The creation and development of the global IASC Education Cluster. Background paper for EFA Global Monitoring Report 2011.
10. Abakumova, N.N., 2012. The development of the model of pedagogical monitoring of innovations // Historical and social and educational thought, 3(13): 71-73. Access mode: http://hist-edu.ru/hist/book3_12/9_abakumova.pdf