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Diagnosis of students intellectual potential on pedagogical specialties

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Abstract

Reforms of higher education in Kazakhstan aim to develop the personality of a student, his creative abilities in professional activity. Therefore, it necessary to establish conditions for assessing students' intelligence and projecting their personal enhancement. This research deals with issues of diagnostics of students' intellectual potential and development of software for such diagnostics. The software has been available to students of pedagogical specialties at 10 higher education institutions of Kazakhstan by mobile learning.

The purpose of the research is to diagnose levels of intellectual potential of students studying at ten tertiary institutions of Kazakhstan whose specialties are "Social pedagogics and self-knowledge" and "Pedagogics and psychology".

Methods of research: short-form selection test (by V. Buzin, E.F.Wonderlic), emotional intelligence test, test of creative potential and creativity, test to determine levels of development of imagination, A.M. Schubert risk propensity test , S. Budassi technique for studying self-esteem of a person and others.

Technique to diagnose intellectual potential of a person enabled to analyze thoroughly and fully students' levels of development of this capacity, to form their adequate perception of the level of their intellectual and cognitive development, the level of their self-esteem and perception of themselves as individuals and professionals, the level of development of their empathy and skills for relationships with surrounding persons.

The developed complex diagnostic technology can be widely used to design individual development trajectory for students. The received results of the research on intellectual potential can be used in individual and group psychological work with university students. The developed software can be used to read elective courses, to create profiles of students and a group of students. The software is adapted for mobile learning.

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1. Intellectual potential

In the national project "Intellectual nation – 2020" special attention is paid to development of intellectual potential of young people. The primary goal of modern system of education is to prepare people possessing critical thinking and capable to orientate themselves in informational flows (Nazarbayev N.A., 2009). The main goal of this project is to educate Kazakhstanis of new formation, to transform Kazakhstan into a country with competitive human capital.

Similar goals are put forward in the advanced countries of the world. For instance, P. Graham, the historian of American education, writes: "Nowadays the USA need intellect enhancement and character building of the youth. Educational institutions shall subordinate their activity to these particular goals. Enhanced intellect is more important for cognitive process than academic achievement" (Graham P., 2011, p.252).

Intelligence is

- general ability to learn;
- system of cognitive processes and functions;
- general ability to perceive and solve various challenging personal problems which enables the individual to act successfully;
- general mental ability which enables to adapt to the environment and perform life-sustaining activity effectively (Vasserman L.E., 2008).

The intellectual potential of the individual is the potential capacity of the individual (which is not probably actualized at present) to quickly and correctly resolve complicated intellectual tasks. The intellectual potential of the individual enables to acquire new knowledge, intellectual skills and competencies at a fast pace (Sedunova A.S., 2004).

Development of child's intelligence has become one of important tasks of future teachers and educational psychologists. Therefore, their participation in the research ensures that they master the technology to diagnose intelligence and to design the trajectory of the development of an individual. Students of two educational programs of Kazakh universities "Pedagogics and psychology", "Social pedagogics and self-knowledge" took part in the research.

In Kazakhstan beginning from 2010 new program for teacher education "Social pedagogics and self-knowledge" was introduced; future specialty is social pedagogue – teacher of discipline "Self-knowledge". The difficulty in educating such teachers is in duality of the specialty. In order to develop intelligence of every child a teacher of school discipline "Self-knowledge" should himself have a good level of intelligence. Therefore we conducted research on intellectual abilities of students of pedagogical specialties at ten tertiary institutions of Kazakhstan (Mynbayeva A., Vishnevskaya A., 2013). The project was funded by grant from the Ministry of Education and Science of the RK № 1139/GF "Psycho-pedagogical diagnostics of intellectual abilities of the youth at a research university as factor of developing intellectual potential of Kazakhstan".

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2. Technology of complex diagnostics

Modern development of science requires complex diagnostics of intelligence which includes motivation development test, IQ test, tests of emotional intellect, creativity, social behavior, self-esteem, self knowledge, etc. The developed technology included three stages: diagnostic, analytical and consultative ones.

The diagnostic stage included: diagnostic complex of psycho-pedagogical techniques aimed at studying levels of intellectual development: i.e., short-form selection test (by V. Buzina, E.F.Wonderlic), emotional intelligence test (Goleman D., 1995), test to diagnose creative potential and creativity (Tunik E.E., 2002), test of level of imagination (Isayeva E.L., 2008), risk propensity test of A.M. Shubert, technique to study self-esteem of a person of S.A. Budassi (Nikireyeva E., 2007),

Analytical stage included processing and analyzing diagnostic data received through the use of psycho-pedagogical techniques. Analysis of the data of each respondent allowed to assign him to one of 4 levels of

development of intellectual potential which is considered as indicator of intelligence and creativity of an individual. They are as follows: high, above average, average and low levels.

Consultative stage included interviews with students, recommendations on development of their intelligence and drawing up development trajectory. Every participant was given his individual diagnostic results written on standard form. Then consultations with researchers were conducted individually and in groups.

3. Practice of diagnosing students' intellectual potential

The research was carried out from 15 September 2012 to 28 February 2014. The technology of the diagnostics consists of psychological techniques complying with all psycho-diagnostic requirements (reliability, validity, representativeness of received diagnostic data).

The total number of respondents is 146. Students of the Al-Farabi Kazakh National University (Almaty), the L.N. Gumilyov Eurasian National University (Astana), the Kazakh State Women's Teacher Training University (Almaty), the Abai Kazakh National Pedagogical University (Almaty), the M. Kozybayev North Kazakhstan State University (Petropavlovsk), Sh. Ualikhanov Kokshetau State University (Kokshetau), E.A. Buketov Karaganda State University (Karaganda), Aktobe State Pedagogical Institute (Aktobe), Taraz State Pedagogical Institute (Taraz), the S. Amanzholov East Kazakhstan State University (Ust-Kamenogorsk) took part in the study of intellectual potential. The survey among students from various cities of Kazakhstan became possible due to the development of the software and its adaptation for mobile learning.

The average age of the respondents was 19,5 years. The gender composition is represented by the following percentage ratio: 96,6 % of the respondents were female, 3,4 % were male.

Short-form selection test falls into the category of general aptitude tests (IQ). It is designed to diagnose the following "critical points" (A. Anastasi):

- Ability to generalize and analyze material
- Flexibility of thinking
- Passivity of thinking. Switchability
- Emotional components of thinking. Distractability.
- Speed and accuracy of perception
- Use of language. Literacy.
- Choice of optimal strategy. Orientation.
- Spatial imagination (Pashukova T. and others. 1996, p. 60-61).

Based on the results of the diagnostics the students were divided into 4 categories according to levels of development of thinking: high, above average, average and low levels. The results obtained when studying levels of thinking of students of pedagogical specialties are shown in Table 1.

Then assessment of emotional intelligence was carried out (by using modification of D. Goleman test). Emotional intelligence is the ability to understand emotional sphere of human life: to understand emotions and emotional background of attitudes, and to use one's own emotions to solve problems connected with attitudes and motivation. The results of dividing by the levels are shown in Table 1.

Diagnostics of creative potential and creativity was implemented through the use of test of creative potential and creativity (Table 1). Test of "imagination" was also used. There is direct link between results on "creative potential of an individual" and results on "imagination of an individual". The more imaginative a respondent is and the better his imagery and originality the higher his level of creative potential and creativity. To enhance creative potential and creativity of an individual it is recommended to broaden types of creative lessons with students.

To supplement and improve obtained diagnostic data it was decided to carry out research into risk propensity of students of pedagogical specialties according to the technique of A.M. Schubert. It was established that risk propensity of students studying at the 10 tertiary educational institutions of Kazakhstan depends on many factors (characteristics of problem situation, structure of social systems, method of forming a problem, type of decision taken by an individual).

In conclusion, the research into levels of self-esteem of the students of pedagogical specialties was carried out. Budassi technique was applied. According to S.A. Budassi, "one's self-concept is system of ideas of an individual

about himself. It is conscious, reflexive part of a personality. These ideas about himself are more or less conscious and relatively enduring. A social educator wishing to actively develop his intelligence shall have positive "self-concept", perceive himself positively as a person and a professional and have optimal (adequate) self-esteem (Nikireyeva E., 2007).

Table 1. Division of students of pedagogical specialties according to their levels of thinking development

	Indicators of levels of students' thinking development			
	Low *people / %*	Average *people / %*	Above average *people / %*	High *people / %*
IQ – Short-form selection test (SST)	7 people/ 4,8%	56 people / 38,4%	51 people/ 34,9%	32 people/ 21,9%
EQ	9 / 6,2%	65 / 44,5%	44 / 30,1 %	28 / 19,2%
Creative potential & creativity	13 / 8,9%	60 / 41,1%	43 / 29,5%	30 / 20,5%
Imagination of students	13 / 8,9%	59 / 40,4%	42 / 28,8 %	32 / 21,9%
Risk propensity of students	14 / 9,6%	57 / 39,1%	38 / 26,0%	37 / 25,3%
Self-esteem of students	13/ 8,9%	51 / 34,9%	49 / 33,6%	33 / 22,6%

It is widely accepted in pedagogics and psychology that self-esteem can be optimal and non-optimal. If an individual has optimal, adequate self-esteem he correctly compares his possibilities and abilities, treats himself reasonably critically, tries to look realistically at his failures and successes, tries to set attainable goals for himself which can be actually implemented. He assesses his achievements by applying not only yardstick, but tries to foresee how other people, i.e., his colleagues and relatives will feel about it. In other words, adequate self-esteem is the result of constant search of actual measure without self-partiality, without being excessively critical to his own communication, behavior, activities, emotions. Such self-esteem is the best one for particular conditions and specific situations.

To make it possible for students to take part in the research, software with the research tests titled "The psycho-pedagogical laboratory" was developed. The software was adapted for mobile phones working on platforms OC Android and OC Simbian.

4. **Discussion**

Based on the results of the diagnostics the students were divided into 4 categories according to the levels of the development of personality intellectual and creative indicator: high, above average, average, and high (Table 2)**.**

Table 2. Division of the students by levels of personality intelligence & creativity development indicator

	Level of intelligence development			
	Low	Average	Above average	High
Development of students' intellectual potential	11/ 7,5%	58 / 39,7%	44 / 30,2%	33 / 22,6%

The conclusions based on the research of intelligence of the students of pedagogical specialties studying at 10 higher educational institutions in Kazakhstan are as follows:

1. 22,6 % of respondents have high level of development of intellectual potential. The students of this category at the time of their studies at higher education institutions have high creative potential and creativity, highly developed creative abilities which can be realized in various forms of creation (music, painting, literature, etc.). Indicators of thinking such as generalization, analysis, flexibility, inertia, swithchability of students with high level of intellectual potential are highly developed. Indicators of perception, such as speed, accuracy, distractability of students included in this category are highly developed; indicators of attention (distribution, swithability) are highly developed.

2. Above average level of development of intellectual potential was diagnosed in 30,2 % of the students. The students included in this category need educational help and support which should be offered in the form of psychological training (according to the opinion of the students themselves), individual psychotherapeutic work, supervisory support of students on certain issues concerning their professional and personal self-improvement.

3. Average level of development of intellectual potential was diagnosed in 39,7 % of the students. Low level of development of intellectual potential was diagnosed in 7,5 % of the students.

4. Analysis of the diagnostic data obtained upon processing the respondents' results showed that the higher was the risk propensity of the respondents the more the respondents were motivated to succeed. The higher was motivation to avoid failure, to foresee possible mistakes in advance the less was propensity to take risks. The students inherently motivated to succeed were not afraid of mistakes, unpredictable high-risk situations they could get into. Risk did not benumbed them and bring them into a state of inertia and mental stupor like it was with the students motivated to fail but encouraged them and helped keep themselves in a state of permanent psychical mobility. The students that were inherently motivated to succeed and confident of their success analyzed the list of possible negative consequences keeping in mind that any risky decisions entailed inevitable losses and the main task was to minimize them.

5. The prevailing motive of all the male respondents was the motive to succeed. It was found out that all the male respondents had high level of risk propensity. It proves the theory about prevalence of risk in men in comparison with women. According to the research results the all male respondents had adequate self-esteem and high level of motivation for professional activity.

Finally, every student was given his results of diagnostics on standard forms. The researchers consulted the students, gave them recommendations on the development of their intelligence. The students were recommended to draw up and comment on their own trajectory of development based on the obtained results and their professional aspirations. The students with average and low levels were given specially selected exercises to develop intelligence; individual tasks on the trajectory of their development were worked out for them.

Besides monthly creativity seminars and enhancement trainings were carried out for everyone on the basis of the Al Farabi Kazakh National University. In such a way research educational environment was formed to develop students' personalities.

4. Conclusion

The developed complex diagnostic technology can be used to design individual trajectories of development of students. The obtained results of the research into intellectual potential can be used in individual and group psychological work with university students. The developed software can be applied to read elective courses, to create profiles of students and a group of students.

The research was carried out to study levels of development of indicators of creative potential and creativity of young students. The diagnostic technology included tests of creative potential and creativity, test to determine levels of development of imagination and A.M. Schubert risk propensity test , Johnson creativity questionnaire adapted by E.E. Tunik, J. Bruner test to determine types of thinking and level of creativity, test "Artist –Thinker" and others. Monthly creativity seminars and workshop panels and Web-seminars are carried out for students on the basis of the Al-Farabi KazNU.

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