

FORECASTING STUDENTS' PROGRESS AT UNIVERSITY EDUCATION BY TESTING MULTIPLE INTELLIGENCES USING VIBRAIMAGE TECHNOLOGY VIBRA_MI PROGRAM

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Abstract: Considered a practically oriented model for solving the problem of students abilities matching to the profile of an educational institution using vibraimage technology. The results of testing the profile of multiple intelligence for 84 first-year students of ETU LETI, St. Petersburg, Russia are given. The criteria for assessing the success of education in a technical university for students based on a profile of multiple intelligences are developed.

Keywords: human resource (HR), abilities, vibraimage technology, multiple intelligences, hidden motivation.

In our previous research the problem of conformity between abilities and chosen specialty was considered [1]. 161 first-year studied students of Saint Petersburg Electrotechnical University (LETI), Russia were tested in 2017 year in the said study. In the forecast of academic progress of first-year students was analyzed the profile of multiple intelligence (MI) by Vibraimage technology. That testing illustrated the perspectives of estimating student's academic progress by VibraMI program [1]. The prevalence of technical profile over humanitarian and of logical-mathematical MI over all other MI types were found. By the time, the understanding was it the trend exactly of technical university or just a satiation results stayed unclear. That needs some further researching to confirm or deny the hypothesis of connecting several types of MI with certain profession (specialty). On the one hand, 2018's research is the continuation of 2017' one, but on the other hand, it was expanded by researching the factor of testing person's hidden motivation to miss University's classes. Manipulative behavior (in Odintsova's version — "rental behavior") is a wide-spread external stimulus, which could give unclear or perverted interpretation of test's results. Manipulative behavior always involves hidden motivation to get some advantages and profits without any purposes [2].

The aim of 2018 student's research was to check how could manipulative behavior with hidden motivation to miss classes influence to the results of MI testing.

Methods and Participants

Students were tested by VibraMI program [3]. This program for psychophysiological testing (PPT) of human based on Vibraimage technology — transformation the light video imaging to the image, which was formed by frame difference accumulation in real-time. Vibraimage technology and multiple intelligence theory are combined by dynamic approach to human's parameters research. In context of human research,

vibrainage technology analyzing the motion activity (micromotions) of human head and transform the motion's parameters to the psychophysiological state's (PPS) characteristic. Using in material of [6], linearly opposed system of questionnaire, permit to transform conscious answers and recorded changes of PPS to multiple intelligence profile. Thus, the practical task to determine accordance of student's abilities to changed specialty's profile is realized.

For the period from 11.20.18 to 10.12.18, 84 first-year students of the Faculty of Physics and Technology LETI were tested, students age range 17–20 years, 29 girls and 55 boys. The ethnic composition is homogeneous: 100 Russians.

1. Materials

In 2017 all students of Faculty of Computer Science and Technology (FCST) LETI were suggested to pass a test. Students were informed about time and place to do it. In 2018 experimental conditions had some changes. Standard pre-test briefing was expand by information that pass the test could “person, who wants”. So the concept “all students” was replaced by “students, who wants” to miss institution lessons.

2. Comparative analysis of first-year studying student's multiple intelligence profile for 2017–2018 year

On the figure 1 is given comparative MI profile of 2017 and 2018 years testing

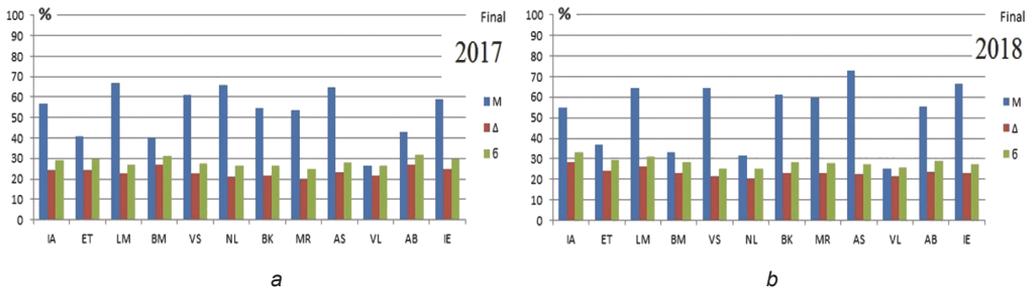


Fig. 1. MI profiles of FCST LETI first-year studying student's multiple intelligence in 2017 and 2018 years

Matching of common MI profiles in 2017 and 2018 demonstrated differences is the rate of leading MI's type. Logical-mathematical type in 2017 was the first (67%) over the Natural (65.5%) and Ascetic-Sacrificial (64.6%) MI types (fig. 1a). But in 2018 Logical-Mathematical MI types is only on third place (66.9%). At the same time, Ascetic-Sacrificial (72.6%) and Interpersonal (66.5%) are on the first and second places (fig. 1b). It's interesting, there are two same values in the percentage of Logical-Mathematical MI types in two independent selections for two years, but its found differences in the profile's structure. This fact correlates with the hypotheses about impossibility to make a conclusion of abilities to technical or humanitarian sciences

only on high percentage of one MI type. And it's impossible to talk about abilities to teaching some specialty, basing on raw data of percentage of one or another MI types.

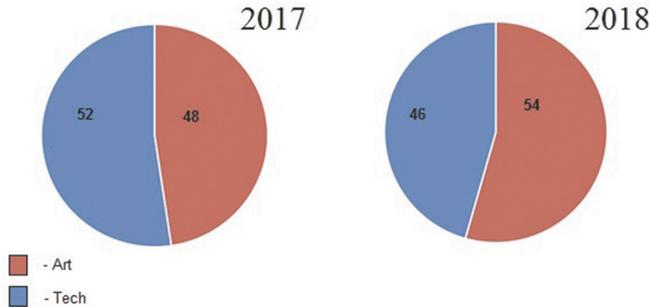


Fig. 2. Arts and technical profiles ratio for testing students in 2017–2018 years

In VibraMI MI types disposition suggested that types with numbers from 1 to 6 refers to the technical profile and with numbers from 7 to 12 — to the humanitarian. Matching results of tests in 2017 and 2018 illustrated increasing of humanitarian profile over technical ones (from 48% to 54%), (fig. 2). So, it gives a confirmation of theory of impossibility to make a conclusion of abilities to technical or humanitarian profile basing on raw data of Logical-Mathematical MI type percentage.

Test's results illustrated, that students with weaker technical abilities had hidden motivation to miss classes, at the same time mathematically gifted student with high level on Logical-Mathematical MI type preferred studying to testing.

3. MI profile's comparative analysis based on Unified State Exam (USE) results and first exams in different groups

84 students, who has been tested by VibraMI, were divided into 3 groups, basing on USE and first exams results, same with 2017. Summary results of USE were the measurement of progress's estimation. Students were divided into 3 groups. In addition, based on first exams results students were divided into 3 more groups, depending on passing 4 exams and permissions to the exams. The first group (1) contained students with the least progress — average rating less 3 of the first exams. The prohibition to exam estimated by zero. The second group (2) contained students with average rating from 3.01 to 3.99. Student with average rating over 4 were in the third group (3).

It was observed, that 3 groups based on USE results are much different to the groups, based on first exams results (1 C). Let's match results of USE and 1 C in group 1.

Description of MI types placed in [6]. Analysis of USE results in group 1 (least progress students) illustrated the dominance of interpersonal MI type (74.7%). Second and following places are (in descending order): Bodily-Kinesthetic (65.9%), Ascetic-Sacrificial (65.4%) and Visual-Spatial (64.6%), (fig. 3 a). Logical-Mathematical MI type is on the 6-th place in the group of the least USE results (56.1%). Matching

USE results with first exams results, another disposition of MI types was found: Interpersonal (85.3%), Ascetic-Sacrificial (68%) and Visual-Spatial (63%), (fig. 3 b). Logical-Mathematical MI type is on the 7-th place (47%) (in 2017 it was 5-th place — 58.4%).

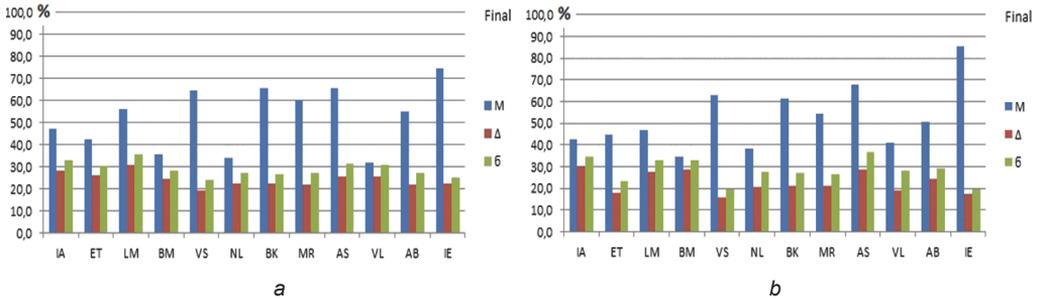


Fig. 3. MI profile in group 1, based on USE (a) and 1 C (b)

On the one hand, Logical-Mathematical goes from 6-th to 7-th place in the MI types hierarchy, but on the other hand, differences in its rating is rather large — 56.1% and 47%. Thus, Vibraimage technology is more sensitive instrument to find mathematical gifted students than USE (summary USE results of some mathematical gifted students were very low).

Comparison of group 1 results in 2017 and 2018 by rating of Logical-Mathematical MI type descending from 58.4% (2017 year) to 47% (2018 year). These results confirm the fact, that tested persons had hidden motivation to miss the classes and weakest students were tested. Let's consider results in group 2 (middle rating):

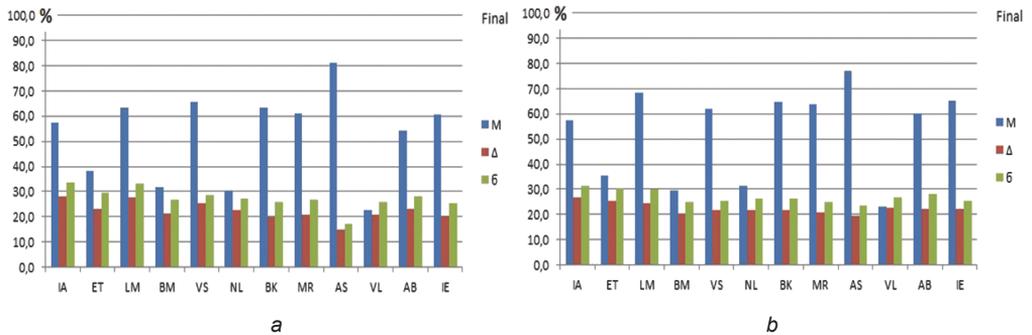


Fig. 4. Group's 2 profile of multiple intelligences, based on USE (a) and 1 C (b)

According to the results of group 2 testing, logical-mathematical MI type is on the third place (63.2%), whereas Ascetic-Sacrificial (81%) is the first and Bodily-Kinesthetic (63.3%) is the second (fig. 4 a). These results are in correlation with the first exams results. Logical-Mathematical MI type of student from group 2 goes to the

second place (fig. 4b). Ascetic-Sacrificial (77.1%) like mostly is the first placed, the third is Interpersonal (65%). Almost, group 2 is more successful then group 1. This trend is independent on combination of initial data (fig. 4a,b). It seems, that student with the middle progress are persons, who had some external life circumstances, which were the reason for them not to become the most successful, but that student have a really good potential. The same trend is in 2017’s tests: Logical-Mathematical MI type is the second (66.1%) by USE results and on the first place by 1 C results. Thus, students with middle progress had not hidden motivation to miss classes (comparative with the group 1).

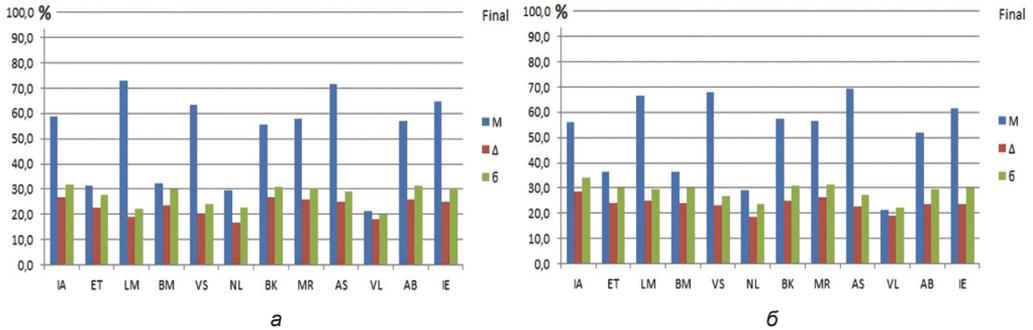


Fig. 5. Group’s 3 profile of multiple intelligences, based on USE (a) and 1 C (b)

On the first place of MI types in group 3 (highest progress students) is Logical-Mathematical (73.1%), the second is Ascetic-Sacrificial (71.5%), then is Interpersonal (64.9%), (fig. 5a). After first exams, MI types disposition changed: the first became Ascetic-Sacrificial (69.3%), the second — Visual-Spatial (67.9%), then Logical-Mathematical (66.5%), (fig. 5b). In 2017 Logical-Mathematical MI type was the third and by USE results, and by the results of first exams. This results gives a possibility to suggest, that group 3 (student with highest progress) in 2018 are weaker by their potential that students from group 3 in 2017. The most obvious suggestion is that the most successful student had not tested, because they prefer to visit classes.

Conclusions

Performed testing again illustrated high perceptivity of student’s progress estimation by VibraMI program In 2018’s research it was decided to check how could influence hidden motivation to the results of MI testing. It shows that hidden motivation could influence on test’s results, but in different rate. The least progress students (group 1) are the most sensitive to the hidden motivation to miss classes in the compare with the students from group 2 (middle progress). But results from group 3 (students with the highest progress) couldn’t be compared with the result from group 1 and 2, because the most gifted students hadn’t been tested.

Summarizing, the developed VibraMI method can be successfully used to choose the University, which is suitable to the abilities of each person and its MI profile.

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