бенности используемого метода. После этого приводится перечень вопросов для самоконтроля и только тогда студент приступает к выполнению индивидуального задания. Задания лабораторных работ подобраны со спецификой специальности. Разнообразие заданий помогает совершенствовать знания студентов, а постепенное нарастание сложности стимулирует проявление и развитие творческих способностей. Это обеспечивает вовлечение студентов в работу, их мотивацию и активность при изучении теоретического материала. Итоги всех лабораторных работ каждого студента фиксируются в отдельном файле, затем оформляются в виде отчета и выводятся на печать, или сохраняются в электронном виде.

Отметим, что основой технических и технологических новшеств, востребованных на производстве, являются научные знания. Фундаментальная составляющая обучения дает возможность получить будущему специалисту ***систему*** необходимых базовых знаний, умений, навыков, способствующих эффективной интеллектуальной деятельности.

UDC 510.24

MOTIVATION TO LEARN MATHEMATICS DEMONSTRATES POSITIVE CORRELATIONS

D. B. ESHMAMATOVA, A. A. ESHKABILOV, M. N. ISLAMOVA
Tashkent State Transport University, Tashkent, Republic of Uzbekistan

He who possesses knowledge possesses the world
N. Rothschild

The main purpose of vocational education is to work competitively in the market, good in his profession to know and relate to the relevant fields of activity aimed at continuous professional growth, for social and professional mobility aspiring qualified personnel training. Today's main task is lifelong learning even after higher education. In this, in the process of studying at a higher educational institution, the conditions for developing requirements are very important.

Teaching and learning strategies are broad concepts. Teaching strategies refer to a wide range of processes, from the way in which classrooms are organized and resources used to the daily activities engaged in by teachers and students to facilitate learning. Student learning strategies refer to cognitive and meta-cognitive processes employed by students as they attempt to learn something new.

The literature on students' motivation to learn often makes a distinction between intrinsic and extrinsic motivation, commonly holding that intrinsic motivators are more effective than extrinsic ones in engendering engagement and performance. The report uses the index variable interest in and enjoyment of mathematics to represent this construct. This variable derives from a series of questionnaire items on how much students enjoy and look forward to doing mathematics. The report considers subject-matter interest to be an aspect of student learning strategies, especially if interest in the subject flows in some way out of or from the teaching. This type of positive motivation might be expected to result in increased achievement. In contrast to the intrinsic nature of interest and enjoyment, students may be motivated to study mathematics by its perceived importance to future education or to careers. To analyze this possibility, index of instrumental motivation in mathematics, measured by a series of questionnaire items on the perceived value of studying mathematics for these external reasons [1].

Together, on average, the two measures of motivation to learn mathematics account for an additional 5 % of performance variation among students but no additional performance variation among schools. Students' motivation accounts for 11 % of the variation in student performance in Norway, 9 % in Denmark and Finland and 8 % in Korea. Students' reported levels of interest in and enjoyment of mathematics show relatively strong positive association with mathematics performance. However, this changes mainly to moderate Mathematics Teaching and Learning Strategies. Are Students' Perceptions of their Mathematics Teaching and Learning Related to Mathematics Performance? In contrast, students' instrumental motivation to learn mathematics, which also has a strong positive observed association with performance, continues to show significant positive effects. It is interesting to note that in Poland, the United States, Canada and the Russian Federation, the effect of students' interest in and enjoyment of mathematics is negative while the effect of students' instrumental motivation to learn mathematics is positive.

Positive attitudes towards school and motivation to learn may be, independently of their impact on achievement, important outcomes in their own right. The four measures of students' perceptions of school in general and their motivation to learn mathematics show positive correlations among themselves. This lack of independence among these measures no doubt accounts for the change in patterns of relationship when all of the measures enter into the same analytical model [2].

All students must be motivated in some way to engage in mathematical activity, however, the nature of that motivation largely determines the success of their endeavor. In particular, students' motivations can be divided into two distinct types: extrinsic motivation and intrinsic motivation. Extrinsically motivated students engage in learning for external rewards, such as teacher and peer approval and good grades. These students do not necessarily acquire a sense of ownership of the mathematics that they study; instead they focus on praise from teachers, parents and peers and avoiding punishment or negative feedback. In contrast, students who are intrinsically motivated to learn mathematics are driven by their own pursuit of knowledge and understanding. They engage in tasks due to a sense of accomplishment and enjoyment and view learning as impacting their self-images. Intrinsically motivated students, therefore, focus on understanding concepts. Thus, intrinsic, rather than extrinsic, motivation benefits students in the process and results of mathematical activities.

Like socio-economic status, students' self-confidence and motivation as learners show consistent correlations with achievement. These factors could also be related to teaching and learning strategies, and therefore they are included as control variables in the models. Nevertheless, unlike socio-economic background, the direction of causation is not at all clear for these variables. That is, it is possible that attitudes can be influenced by teaching strategies that attitudes influence learning strategies or that attitudes are affected by achievement. For example, the question remains unresolved of whether a high level of perceived competence in mathematics precedes or follows a high level of achievement, or whether low achievement engenders high mathematics anxiety or vice versa. As noted earlier, cultural differences are likely to affect students' interpretation of self-confidence and motivation questions. Results in these areas should be interpreted with country differences in their mean index values in mind. Readers familiar with particular countries or cultures are better placed than the authors to make judgments about such differences. These variables show some unexpected patterns when taken in the context of other factors in the full model and hence warrant further discussion.

Self-efficacy is often seen as a major determinant of behavior. However, there is some debate as to whether self-efficacy is best thought of as a generic or a subject-specific trait. The extent of its correlation with achievement seems to depend on the type of self-efficacy measure used. In countries where students have least confidence in their own efficacy, this variable also makes least difference to their predicted achievement; it is most closely correlated in some countries that have about average self-efficacy overall [3].

The question arises of whether there would be any benefit in attempting to enhance self-efficacy in mathematics as a means of improving achievement. Students in Japan and Korea have among the lowest average sense of self-efficacy in mathematics, though both countries have among the highest average achievement levels. This finding raises the further question of whether the culture or the school systems of these countries are in some way engendering more negative student opinions of their mathematics competence than the reality of their achievement warrants.

Another affective variable showing wide differences across countries is anxiety in mathematics. Students in Mexico, Japan and Korea, and the partner countries Tunisia, Brazil and Thailand, express particularly high levels of anxiety about mathematics. However, in Denmark, Finland, the Netherlands and Sweden students show particularly low anxiety. Both within and across countries, students who are anxious about learning mathematics tend to perform worse in the subject.

Again, there may be lessons for teachers here, especially in countries where anxiety is highest, to make more efforts to reduce it. Particularly in Mexico and the partner country Brazil, high anxiety tends to go with low mathematics performance. Some indication to teachers that students' motivation is an important aspect of their learning. When asked about their motivation to learn mathematics – out of interest or for more instrumental reasons – students once again responded differently across countries. Although cultural differences may influence the way students respond to this question across countries, within countries those with the highest motivation perform best on average (there is a moderate correlation between motivation and performance). Much of the research on efficacy, attitudes and motivation hinges on the working hypothesis that high values of such variables are associated with high achievement. However, some sources suggest that the relationship between these factors and achievement is subtler and more indirect than the simple hypothesis would indicate. This study strongly reinforces that view. While most of the bivariate relationships operate in the predicted direction when examined within countries, there is an obvious country-specific component in the patterns. For example, students in several high-achieving countries, particularly Asian ones, show a generally negative sense of self-efficacy and have relatively negative attitudes and motivations.

The existence of negative between-country effects suggests that country-specific features strongly influence the measurement of these factors. Even within countries, however, positive associations between certain attitudes and performance sometimes become negative when adjusting for other factors [3, 4].

Conclusion

These factors influence achievement, it might be desirable to direct teaching strategies towards improving attitudes and motivations in the hope that this would have indirect positive effects on achievement. While there is no way of measuring the extent to which teachers deliberately aim to improve attitudes in order to improve achievement, in practice there is a consistent bivariate association between good student attitudes and the adoption of helpful teaching strategies, for example by creating a positive classroom climate. Nevertheless, it seems that there is little to be lost in having teachers act in ways that help reduce mathematics anxiety and increase students' sense of self-efficacy in mathematics and their self-concept. However, teachers should also note that students who enjoy mathematics or feel a sense of belonging at school actually tend to perform worse in mathematics when adjusting for all other factors. This evidence does not mean that enjoying mathematics causes students to perform worse, but that a student who enjoys mathematics more than another will not necessarily perform better if she does not also have other characteristics that tend to go with enjoyment, such as greater confidence in her mathematics ability.

Reference

1 *Cooper, H.* Does Homework Improve Academic Achievement? A Synthesis of Research, 1987-2003, / H. Cooper, J. C. Robinson, E. A. Patall // Review of Educational Research. – 2006. – Vol. 76, no. 1.

2 *Bandura, A.* Perceived Self-Efficacy in Cognitive Development and Functioning / A. Bandura // Educational Psychologist. – 1993. – Vol. 28, no. 2.

3 *Lepper, M. R.* Motivational Considerations in the Study of Instruction / M. R. Lepper // Cognition and Instruction. – 1998. – Vol. 5, no. 4.

4 *Wang, M. C.* What Helps Students Learn? / M. C. Wang, G. D. Haertel, H. J. Walberg // Educational Leadership, Dec. 1993 – Jan. 1994.

UDC 510.24

MAJOR INNOVATION REQUIRE ALIGNING THE EFFORTS OF ALL THOSE INVOLVED IN STUDENTS' MATHEMATICAL DEVELOPMENT

Sh. A. KASIMOV, R. A. KHIKMATOVA, M. M. TASHMATOVA
Tashkent State Transport University, Tashkent, Republic of Uzbekistan

Live as if you were to die tomorrow.
Learn as if you were to live forever
Gandhi

Just as everyone has a unique fingerprint, every student has an individual learning style. Chances are, not all of your students grasp a subject in the same way or share the same level of ability. So how can you better deliver your lessons to reach everyone in class? Consider differentiated instruction – a method you may have heard about but have not explored.

History of differentiated instruction

The roots of differentiated instruction go all the way back to the days of the one-room schoolhouse, where one teacher had students of all ages in one classroom. As the educational system transitioned to grading schools, it was assumed that children of the same age learned similarly. However, in 1912, achievement tests were introduced, and the scores revealed the gaps in student's abilities within grade levels.

What differentiated instruction means

Carol Ann Tomlinson is a leader in the area of differentiated learning and professor of educational leadership, foundations, and policy at the University of Virginia. Tomlinson describes differentiated instruction as factoring students' individual learning styles and levels of readiness first before designing a lesson