

Motivating Students to Succeed in Mathematics: An Annotated Bibliography

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These articles are related to intrinsically motivating students within the subject of mathematics. . The purpose of this annotated bibliography is to determine the best way to motivate students as a math teacher and how to teach in a way that students will not look at math as a means to an end or a subject that they just need to get through and will never have to worry about again. These articles look at a few different theories and strategies to determine what motivates or demotivates students in the classroom. A common theme throughout is that students' self-efficacy will increase as they are more successful in the subject.

Banda, D. R., Matuszny, R. M., & Therrien, W. J. (2009). Enhancing motivation to complete math tasks using the high-preference strategy. *Intervention in School and Clinic, 44*(33), 146-150. DOI: 10.1177/1053451208326052

The high-preference strategy, while easy for teachers to conduct, is a great strategy for helping general students and well as those who need special education. Through simple data collection and analysis, teachers have the ability to determine students' high and low preference level to math tasks. The high-preference strategy is great to use for modifying and tailoring student work, so the student is able to be successful at the task. By giving students questions that they will be able to complete, with some challenge still involved, followed by more difficult questions, they will be more intrinsically motivated and confident when given the thought-provoking question. Although this strategy can work for all students, it has been found to be very successful with students who have behaviour problems or learning difficulties.

Gottfried, A. E., Marcoulides, G. A., Gottfried, A. W., Oliver, P. H., & Guerin, D. W. (2007).

Multivariate latent change modeling of developmental decline in academic intrinsic math motivation and achievement: Childhood through adolescence. *International Journal of Behavioural Development*, 31(4), 317-327. DOI: 10.1177/0165025407077752

Whether or not students achieve in math has a huge effect on their intrinsic motivation. It is found students who are more unsuccessful in math through childhood and adolescents will be less successful and motivated as they get older. As a math teacher, it is important to strive to keep all students successful in the subject so that they will not lose their motivation. The need for achievement in math starts at the elementary ages, so elementary teachers must focus on each student in their classroom being successful in math. If this is not done, students will lose their intrinsic motivation prior to the grades that explain more difficult math concepts and will struggle to succeed.

Hardré, P. L. (2011). Motivation for math in rural schools: Student and teacher perspectives.

*Mathematics Education Research Group of Australasia*, 23, 213-233.

DOI: 10.1007/s13394-011-0012-5

Students have a tendency to be more avoidant towards math and find themselves to be less competent in math than all other subjects. It is possible that (secondary) math teachers, as a whole, find it more difficult to intrinsically motivate students, or focus less on motivating their students. Teachers need to re-evaluate what they are doing to motivate students in math as students are not receiving the message that teachers think they are receiving. Math teachers have not put enough focus on strategies that tap into powerful, internalized, and needs-based processes. The best

approach is not always strategies as just problem-solving methods. Be pro-active in needs-based approaches and try to solve problems as soon as they are found.

Kusurkar, R. A., Croiset, G., & Ten Cate T. J. (2011). Twelve tips to stimulate intrinsic motivation in students through autonomy-supportive classroom teaching derived from self-determination theory. *Medical Teacher*, 33(12), 978-982.

DOI:10.3109/0142159X.2011.599896

This article outlines twelve ways that teachers can simulate intrinsic motivation in the classroom. The general theme is for teachers to be supportive, give students some control, and give students goals/work that can be challenging, but still done well. By doing these things students will take interest and see purpose in their education. Once this happens they will begin to care more about what they are doing. The focus is on autonomy. The article is a neat and tidy way to find ways to motivate students in the classroom. It is written in an easy to understand way that can benefit many teachers.

Matarazzo, K. L., Durik, A. M., & Delaney, M. L. (2010). The effect of humorous instructional materials on interest in math task. *Motivation and Emotion*, 34, 293-305.

DOI: 10.1007/s11031-010-9178-5

Humorous instruction in math can have its benefits, but it is important to use this strategy carefully and to pick times that it is advantageous. Students who have a low interest in math can benefit humorous instruction, but students with a high interest in math begin to lose motivation when some of the seriousness is taken away. This strategy can be used for differentiating tests and assignments and is important to remember when giving one on one help. It is possible that the

positive affect humour has, may be short lived, so it must be used at strategic times. In some cases, delivering more humorous instruction can help students who have a lot of anger, hostility, and resentment towards the subject of math.

Simpkins, S. D., Davis-Kean, P. E., & Eccles, J. S. (2006). Math and science motivation: A longitudinal examination of the links between choices and beliefs. *Developmental Psychology*, 42(1), 70-83. DOI: 10.1037/0012-1649.42.1.70

Students who perceive themselves as successful in a given subject are much more likely to pursue that subject as they age and will have much higher self-efficacy within that subject. Students are more likely to take an interest in a subject if extra-curricular activities are available to participate. This will increase intrinsic motivation in students, but the first step is still to make sure students have success in the subject. When grades and getting into college become the focus of subjects, students tend to lose intrinsic motivation and begin to learn as a means to an end. The culture of students beliefs about math and science needs to be adjusted for students to be more successful and more motivated to pursue math and the sciences.