

An alternate characterisation of Developmental Mathematics students

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Developmental – or the antiquated “remedial” – mathematics is a large enterprise in American colleges. For the California State University (CSU) system roughly one-third of all students require developmental mathematics. Placement in these courses in the CSU is determined by a standardized test. Those who fail are required to take some campus-specific variant of developmental mathematics. This poster addresses the question, what more can be said about students enrolled in developmental mathematics programs other than they have failed an exam? An analysis of survey instrument data will be presented that shows San Jose State University developmental mathematics students are fundamentally different, undesirably so, than their non-developmental counterparts on a range of attitudinal, affective, and dispositional measures.

Key words: developmental math, attitudes towards and perceptions of mathematics

Poster Description

Though developmental students failed an exam to be streamed into their developmental courses, this failure may be the symptom and not the cause of their under-performance in mathematics. Institutional records at San José State University (SJSU) indicate that developmental mathematics students never reach the level of academic achievement of their non-developmental colleagues, if they ever complete the developmental sequence – a result contradicting other studies (eg. (Bahr, 2008)) – putting into question the effectiveness of current developmental mathematics education practices at SJSU.

An online survey was sent in Fall, 2016 to all San Jose State University students enrolled in a freshman mathematics course. In addition to general questions about financial concerns of the students, the survey comprised two established survey instruments: the Mathematics Attitudes and Perceptions Survey (MAPS; Code, et al., 2016) and the Abbreviated Math Anxiety Scale (AMAS; Hopko, et al., 2003). The MAPS survey assesses the students on a range of factors known to impact academic achievement in mathematics: growth mindset, seeing connections between mathematics and the real world, confidence, interest, persistence in working with mathematics, sense making, and views of the perspectives on answers. Students' MAPS responses are weighed against consensus responses of mathematicians and relative-to-expert scores are reported for each factor, along with an overall expertise index. The AMAS assesses students on their level of mathematics anxiety. The survey reports an overall anxiety score, the sum of learning and assessment anxiety.

On almost all MAPS and AMAS scores, developmental math students scored less-favourably than their non-developmental counterparts. There are two notable exceptions: i) developmental math students scored higher on the “connections to the real world” subscale, and, ii) there was no statistically-significant difference between the groups on the interest in mathematics subscale. The poster presents these comparisons along with a cluster analysis that further characterises sub-groups of developmental math students.

The results of this study highlights the importance of addressing non-conceptual aspects of learning and performing mathematics in developmental mathematics courses. Doing so, we argue, is the only way to provide effective developmental mathematics education.

References

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