**Winderbaum**

**``How can MathsTrack (University of Adelaide mathematics bridging course) be improved?’’**

Mathematics bridging courses serve an increasingly critical role in educational systems globally --- they provide a pathway into mathematical higher education for students who may otherwise be blocked from pursuing such education. Mathematical higher education is rising in demand, particularly in fields of study other than mathematics itself that require some amount of mathematical competency --- science, engineering, medicine. Participation in higher level mathematics education in high school has been in steady decline for over three decades, in no small way due to negative perceptions of mathematics held by the public. This ``Mathematics Problem’’ of increased industry demand for a mathematically educated workforce and decreased participation in mathematics education has two key impacts. First, it negatively impacts on the economy as mathematically skilled workers for key industries are in reduced supply. Second, it further disadvantages non-mathematically educated people in the job market and potentially either reinforces existing social inequalities or pushes more people towards pursuing a mathematics education, and hence potentially enrolling in a mathematics bridging course. This has been observed with the number of students enrolling in mathematics bridging courses, particularly the number of adult or ``mature’’ students, steadily increasing ­over the past several decades. Providing such alternative or ``non-traditional’’ pathways into mathematical higher education (such as bridging courses) is particularly critical for already disadvantaged students who may otherwise not have the option to engage in mathematical higher education at all. It also has the advantage that mathematics education can offer increased social mobility and job prospects.

In this work, the challenges faced by mathematics bridging courses are considered in general, and specifically in the Australian context of the University of Adelaide (UofA) mathematics bridging course MathsTrack. Potential improvements to MathsTrack are investigated through two avenues of research. First, a literature review uncovers some of the key challenges faced by mathematics bridging students: maths anxiety, the secondary-tertiary education transition, negative affect towards maths, and self-efficacy. The literature also provides insight into approaches that show promise in overcoming these challenges. Second, a curriculum mapping between the Australian senior secondary high school curricula (the Australian curriculum and SACE, mathematical methods and specialist mathematics) and the content of the University of Adelaide bridging courses (in particular MathsTrack). Alignment of the content of MathsTrack to the Australian senior high school curricula is desirable in order to support students in their future success as many of the common pathways they will pursue (entry level university maths courses, for example), are designed based on the assumption students entering them are coming from having completed high school in Australia recently. Alignment of these curricula is discussed, and recommendations made that could bring MathsTrack into closer alignment with the current high school curricula, within the context of the existing body of knowledge summarised in the literature review. The recommendations made from the synthesis of these two avenues of research will hopefully offer actionable pathways for the continued improvement for the University of Adelaide’s bridging courses, and beyond that provide some broader context of the concerns that need to be addressed in mathematics bridging more broadly.