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THE SeMTAC PROJECT:

Factors Which Influenced Secondary Mathematics Teacher Education Students at Charles Sturt University-Mitchell to Choose Secondary Mathematics Teaching as a Career.

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Abstract

This paper reports on one aspect of a larger study into the factors which influence school leavers to consider, or not to consider, a career in secondary mathematics teaching. The study questioned Year 12 students, their parents, the mathematics teachers at their school, and students from Charles Sturt University-Mitchell studying to be secondary mathematics teachers. This paper concentrates on the responses of this last group. Their responses are discussed using a "Key Factors" framework. These factors were those identified by a group of teachers in informal discussions before the major project started. Some characteristics of the CSU-Mitchell students are discussed, along with their attitudes to, and opinions of, their chosen career. Results show that entry to a secondary mathematics teacher preparation course was not a "last resort" option for a majority of the CSU-Mitchell students, and that enjoyment of, and success in, school mathematics were identified as having the strongest influence on their decisions to enter a course to prepare for teaching secondary mathematics. Another strong influence was their mathematics teachers' teaching of mathematics. The implications of these results are also discussed.

The Project title "SeMTAC" is the acronym derived from "Secondary Mathematics Teaching as a Career". The SeMTAC project was a ten months' study into the factors which influence school leavers to consider, or not to consider, a career in secondary mathematics teaching. In order to gather a comprehensive set of data, the following groups were surveyed:

- Year 12 students;
- their parents;
- all the mathematics teachers at their schools; and
- all secondary mathematics teacher education students at Charles Sturt University-Mitchell.

This paper presents the results that part of the SeMTAC project which pertains to the responses of 69 secondary mathematics teacher education students at CSU-Mitchell.

The rationale for surveying Charles Sturt University's population of Bachelor of Education (Secondary Mathematics) students was to gain information on the factors which were important in influencing these students to enter a secondary mathematics teacher preparation course. The current views of these students on the career of secondary mathematics teaching were also sought.

The Instrument

The questionnaire was constructed to allow each respondent to provide:

- (i) Personal data (gender, stage in course, age, type of secondary school attended, mode of entry to the course, HSC maths course, HSC aggregate, home region, year of HSC, completion, sources of information about CSU-Mitchell prior to enrolment);
- (ii) Responses to 14 Likert Scale Items exploring various factors influencing the respondent's decision to enter a secondary mathematics teacher education course;
- (iii) Responses to 11 Likert Scale Items exploring various factors influencing the respondent's decision to enrol at CSU-Mitchell; and
- (iv) Responses to 45 Likert Scale Items related to issues such as salaries, working environment, support for teaching, societal influences, government policies, curriculum change and the changing role of the mathematics teacher.

Results

In this section various data associated with these students is reported. Whilst most data is directly related to the aim of the SeMTAC Project, some data have been collected to provide CSU-Mitchell with information on the impact of the various facets of the publicity undertaken to attract students to the B Ed (Sec Maths) Course.

Some Characteristics of the CSU-Mitchell Students

The CSU-Mitchell Students' Questionnaire was completed by 69 full-time students of whom 31 were female and 38 were male. There were 21 students in the first year of the Course, 18 in the second year, 14 in third year and 16 in fourth year.

Information which most influenced students' decisions to enrol in the CSU-Mitchell's B Ed (Sec Maths) Course was gained from a variety of sources with 51 students (73.9%) having gained information about the Course from sources other than University enterprises. For 7 of these students (10.1%), friends were the source of information. Surprisingly, Careers Advisers were the source of information for only 7 students (10.1%). Other sources such as Open Days, Careers Days or the University Course Coordinator, were reported as sources of information for very few students. A majority of students (60.9%) had visited the University campus before enrolment.

The age distribution of the students shows 21 students (30.4%) aged 18 or 19, 36 (52.2%) aged 20 to 22 inclusive, 8 (11.6%) aged 23 to 26 inclusive and 1 (1.5%) each for ages 29, 38 and 39 years.

A large majority of the students (82.5%) received their secondary education in a State secondary school with 8 of the students (11.6%) receiving their secondary education in a Catholic high school. Only 4 students (5.8%) attended an Independent secondary school.

Some 44 students (63.7%) studied Three Unit or Four Unit Mathematics and were thus well qualified mathematically for entry to the Course. The remainder of the students had studied Two Unit or equivalent, with none having studied only 2 Unit General.

Only 23 students (33.3%) reported scoring a scaled H.S.C. aggregate above 310 and 25 students (36.2%) reported aggregates below 280.

CSU-Mitchell Students' Reasons for Enrolling in the Course

This section reports on the responses of the 69 CSU-Mitchell students to the 14 Likert Scale Items designed to explore their reasons for deciding to enter the Course. Examination of their responses indicates that the following factors were strong influences on the students' decisions:

- success in school mathematics (63 students, 91.3%)
- enjoyment of mathematics at school (60 students, 87.0%)
- mathematics teachers' teaching of mathematics (51 students, 73.9%)
- the prospect of working with adolescents (50 students, 72.5%)
- the availability of jobs for secondary mathematics teachers (50 students, 72.5%)

- the way their mathematics teachers acted as people (44 students, 63.7%)

The following factors were rejected as having a strong influence upon their decision to enter the course:

- the availability of NSW Department of (School) Education Scholarships (56 students, 81.2%)
- salaries paid to teachers (49 students, 71.0%)
- not being accepted for entry to another preferred tertiary course (45 students, 65.2%)
- advice on careers in mathematics given by mathematics teachers (43 students, 62.3%)

Factors Influencing the Students' Enrolment in the B Ed (Sec Maths) Course at CSU-Mitchell.

For more than half of the students the strongest factors influencing them to choose CSU-Mitchell as the institution to prepare for a secondary mathematics teaching career were:

- the institution's rural location (47 students, 68.1%)
- the institution's proximity to their home (38 students, 55.0%)

For almost half the students the availability of accommodation at CSU-Mitchell was a strong influence (36 students, 49.2%).

For more than half the students the following factors were not strong influences on their decisions:

- meeting CSU-Mitchell staff (39 students, 56.5%)
- CSU-Mitchell publicity material (36 students, 52.2%)
- CSU-Mitchell selection procedures (36 students, 52.2%)

For more than four fifths of the students there was polarisation with respect to the following factors:

- CSU-Mitchell's B Ed (Sec. Maths.) entry mark; 31 students (44.9%) agreed that this factor influenced their decision and 29 students (42.0%) disagreed that it did.
- Contact with current, or past, CSU-Mitchell students; 29 students (42.0%) agreed that this factor influenced their decision and 29 students

(42.0%) disagreed that it did.

- Knowledge of CSU-Mitchell's Course; 29 students (42.0%) agreed that this factor influenced their decision and 27 students (39.1%) disagreed that it did.

The Students' Responses to 32 Likert Scale Items Related to Secondary Mathematics as a Career.

The 32 Likert Scale Items and the students' response patterns to these items are given in the complete Project Report. The number of students involved in this part of the Project was too small to attempt a factor analysis of their responses to the Likert Scale items. The following discussion has been generated by a post hoc analysis of the content of the 32 items and the students' responses to them.

The Students' Opinions on Mathematics Classroom Climates.

- Over three quarters of the students (75.4%) agreed that "school leavers are not interested in becoming secondary teachers because of what teachers have to put up with in their classrooms"
- Student opinion was polarised on the proposition that "maintaining a positive classroom atmosphere is a real problem in most secondary mathematics classrooms"; 47.8% agreed with this proposition, 34.7% disagreed with it and 17.4% were undecided about it.
- The students were spread in their opinions on whether "too many students are attempting Year 11 and 12 course beyond their capabilities" with 36.2% agreeing, 36.2% undecided and 27.5% disagreeing.
- It appears that, while the students recognised that there are problems with pupil behaviour in mathematics classrooms, a majority did not believe that "adolescents in most mathematics classrooms are hard to control"; 57.9% disagreed with the proposition (with 23.2% being unsure and 18.8% agreeing).

The Students' Opinions on Mathematics as a School Subject and Post School Usefulness.

- Almost half the students (47.8%) disagreed that "most adolescents are not interested in the mathematics they have to learn" whilst 29.0% agreed and 23.2% were undecided.
- With respect to the post-school usefulness of mathematics, 47.8% of the students agreed that current NSW mathematics curricula prepare school-leavers for entry into the workforce whilst 26.9% disagreed and 26.1% were undecided.

The Students' Opinions on Teachers' Salaries and Working Environment.

- More than half the students (56.4%) disagreed that "secondary mathematics teaching is a well paid profession" while 27.5% were undecided.
- Just over half the students disagreed that "mathematics staffrooms are unappealing places in which to work" and that "most secondary mathematics faculties are well equipped with resources" .

The Students' Opinions on Teachers' Job Satisfaction.

- 73.9% of students agreed that "Head Teachers (Mathematics) and other Executive staff provide valuable support for classroom teachers of secondary mathematics.
- 52.2% of students agreed that "the teaching of secondary mathematics is made more difficult by the use of inadequately trained teachers of mathematics".
- 49.3% of students agreed that secondary mathematics teaching provides an opportunity to reside in a location of one's choice.
- 23.2% of students agreed that most secondary mathematics teachers whom they knew would prefer not to be teaching, with 24.6% undecided.
- 66.6% of students disagreed that "Curriculum planning and development do not place demands on secondary mathematics teachers".
- 60.8 % of students disagreed that the "morale of most secondary mathematics teachers is high".
- 44.9% of students were uncertain about whether "Opportunity exists for rapid advancement of mathematics teachers in the teaching profession".

The Students' Opinions on Mathematics Teachers' Teaching.

More than three quarters of the students agreed that secondary mathematics teachers should address curriculum perspectives and account for the gender issue in their teaching. In earlier informal discussions, some teachers had suggested that being required to incorporate such considerations was an additional imposition on their teaching responsibilities; attention to such matters was seen to be time consuming to the detriment of their "real" work, teaching mathematics. On this last matter, the "real" work of teaching mathematics, about half (49.3%) of the students were uncertain or agreed that "Most secondary mathematics teachers are really only concerned with the subject matter", with the other half disagreeing.

The Students' Opinions on Mathematics Teachers' Work - How It is Valued.

Just over one third of the students were undecided as to whether "most parents are appreciative of the efforts mathematics teachers make on behalf of their children" (Item 68) and whether "secondary mathematics teachers' work is highly regarded in the community". Whilst almost half the students felt that parents are appreciative of teachers' work, a similar percentage of students believed that the general community does not value the work of teachers.

The Students' Current Views on Their Intended Career.

The students provided quite positive opinions on the way they perceive themselves in relation to their future role as teachers of secondary mathematics.

- Knowing that they may be required to teach subjects other than mathematics would not have deterred 86.9% of the students from embarking on a secondary mathematics preparation course.
- 85.7% of the students agreed that they still want to be a secondary mathematics teacher (Item 61). However, 21.7% agreed that they would probably use the mathematics in their qualification to seek entry to another profession but 36.2% were undecided.
- 84.1% of the students agreed that they expect to be able to teach all secondary mathematics courses successfully (Item 67). However, 20.3% were uncertain about their competency with the content of these courses whilst 69.6% indicated being at ease with this content.
- 75.3% of the students disagreed that they would seek to abandon a career in secondary mathematics teaching as soon as they could.
- 75.3% of the students disagreed that they would prefer to teach mathematics to able pupils only.
- 60.8% of the students agreed that they felt able to cope with the daily pressures of secondary mathematics teaching. However 31.9% were undecided about their capacity to do so.
- 91.3% of the students disagreed that they would not want to teach mathematics classes beyond year 10.
- 79.7% of the students disagreed that they would want to teach only Year 11 and 12 Two Unit, Three Unit and Four Unit classes.
- 55.5% of the students agreed that they would prefer to teach mathematics in rural secondary schools only whilst 30.4% disagreed with this.

Conclusions

It is interesting to note that entry to a secondary mathematics teacher preparation course was not a "last resort " option for 65.2% of the CSU-Mitchell students.

Enjoyment of, and success in, school mathematics were identified by the CSU-Mitchell students as having the strongest influence on their decisions to enter a course to prepare for teaching secondary mathematics.

For almost three quarters of the CSU-Mitchell students, their mathematics teachers' teaching of mathematics influenced their decisions to enter a course to prepare for teaching secondary mathematics. Assuming this influence to have been a positive one, these findings highlight the mathematics teacher as an important factor influencing school leavers choice with respect to a career in secondary mathematics teaching.

Only about half of the CSU-Mitchell students surveyed believed that parents are appreciative of the work that mathematics teachers do on behalf of their children, with about one third being undecided on this issue.

Amongst the various groups involved in the Project only the parents/guardians registered moderately strong agreement that secondary mathematics teachers' work is highly regarded by the community (40.7% agreed). About half of the other three groups disagreed that it is highly regarded, with strongest disagreement coming from the mathematics teachers (54.8 %).

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