Factors that influence the desire to become teachers of Technology: An Australian study

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Abstract

In this study, 337 pre-service teachers enrolled in Technology Teacher Education Programs (TTEP), in eight tertiary institutions across Australia, responded to a questionnaire seeking information about those factors that influenced their decision to become teachers of Technical and Applied Studies (TAS). The study found: a majority of the respondents were male (71%); most came from urban areas (61%); just over half (51%) entered the course from the workforce and just over a third of the respondents entered the course direct from school. Of the 172 respondents who came from the work force, a total of 93 (86 male) had prior trade experience. Factor analysis of attitudinal items set against a four-point Likert scale produced three factors related to their decision to become TAS teachers. These included encouragement from members of the community, the influence of experiences in technology at school, and a desire to teach. A three stage regression model was created with the scale 'Desire to Teach' as the ultimate dependent variable. Factors most strongly influencing 'Desire to Teach' included hobbies and interests prior to enrolment, encouragement from members of the community and the influence of experiences in technology at school. The authors propose a number of strategies for promoting technology teaching and increasing the TTEP student intake, based on their findings.

REVIEW OF THE LITERATURE

The nature of the problem

There has been a global shortage of teachers in the field of technology education in recent years (Ritz, 1999). In the United States of America (USA), for example, there have been difficulties in maintaining the supply of technology teachers to schools throughout the past decade and a half (Ndahi & Ritz, 2003; Weston, 1997). According to Wicklein (2004), teachers ranked 'insufficient numbers of adequately qualified technology education teachers' as the most critical problem faced by technology education in the United States. Furthermore, they considered the difficulties in recruiting student teachers into Technology Teacher Education Programs (TTEP) as the most critical current issue in technology education. In a review of teacher labour market conditions in Canada, Press, Galway and Barnes (2002) noted that the supply of technology teachers fell short of the demand. Technology education faced similar problems in the United Kingdom, where reported recruitment figures for initial technology teacher education showed a shortfall of 41% in teacher numbers over the 1999/2000 period (Banks, 2000).

In Australia, difficulties with the supply of sufficient numbers of teachers qualified to teach in the Technical and Applied Studies (TAS) subject areas have been experienced by all states over the past decade and a half (Australian Education Union, 2001; Baird 2001; Cornius-Randall, 2004; National Teacher Supply and Demand Working Party, 1998; National Teacher Supply and Demand Working Party, 2003; Teacher Supply and Demand Reference Group, 2006; Teacher Supply and Demand Working Party, 2006) and the request for Government action has become increasingly urgent (Australian Education Union – Victoria, 2007). Both the Australian Education Union (2001) and National Teacher Supply and Demand Working Party (2003) agree that staffing difficulties involving technology teachers exist in both rural and metropolitan schools across Australia.

The causes of the problem appear to be three-fold. Firstly, the numbers of pre-service teachers choosing to enter TTEP (National Teacher Supply and Demand Working Party, 1998) began to decline

"Difficulties with the supply of sufficient numbers of teachers in TAS subject areas have been experienced by all states over the past decade and a half"

some two decades ago. Secondly, in a reaction to the financial situation created by falling numbers, tertiary institutions either cut TTEP, or restructured in order to modify the TTEP alternatives they offered (Fritz, 1998; Gibson & Barlow, 2000; Williams, 1996). Compounding this second situation is that educational institutions offering TAS courses are not evenly distributed around Australia (McGee, 1999). The majority of these institutions are located in New South Wales and, as of year end 2000, the Northern Territory did not have a TTEP of its own (Parliament of Australia: Senate Committee, 1998). The third reason for critical shortages of technology teachers across the Australian states relates to the ages of serving teachers. For example, almost a half of Victoria's technology teachers are aged 50 years or older (Teacher Supply and Demand Reference Group, 2006) and these teachers are beginning to retire in appreciable numbers. While there appear to be modest increases in the numbers entering pre-service TTEP over the past five years (National Teacher Supply and Demand Working Party, 2003; Teacher Supply and Demand Reference Group, 2006), these may only be sufficient to hold the existing situation.

Government responses to this need have been directed at increasing the inflow of teachers and maintaining the numbers of existing teachers (Committee for the Review of Teaching and Teacher Education, 2003a). The Federal Government has moved to minimize the Higher Education Contribution Scheme (HECS) burden on pre-service technology teachers and monitored the entry-level remuneration and ongoing pay scales for teachers (Committee for the Review of Teaching and Teacher Education, 2003b). In addition, the main report of the Committee for the Review of Teaching and Teacher Education (2003b) discussed ways to prolong the teaching life of existing technology teachers by making their working environment professionally rewarding. Finally, attempts have been made to develop tertiary programs that enable technically skilled persons to retrain for careers in teaching (Hancock, 2001). A number of institutions have introduced delivery methods more suited to mature clients with existing technical skills. Charles Sturt University, for example, has developed an Accelerated Teacher Education Program in order to supply TAS teachers for rural areas (Cornius-Randall, 2004) and Avondale College has signed a memorandum of agreement with Newcastle University to enable students to earn academic credit by taking subjects on the Newcastle campus. However, the graduates of these new pathways have yet to make a real impact in the classroom.

There is one aspect, however, that all of the reports cited above appear to have overlooked, i.e. they have not seriously examined those factors that, within the Australian setting, influence an individual desire to become a teacher in the TAS area. If more people are to be encouraged to become teachers of technology, then these factors need to be identified.

> ***"Attitude does not arise in a vacuum; the beliefs and feelings that crystallize into the attitude are shaped by background factors"***

Factors that influence a desire to become a technology teacher

In the USA, Wright and Custer (1998) adapted an instrument first used by Devier (1986) to examine those factors that influenced pre-service teachers to choose technology teaching as their career. The study distinguished between those factors that respondents indicated were most influential in their choice, and those factors most commonly reported in the study.

The three factors reported by the respondents in the USA study as being most influential in their decision were encouragement from:

- secondary school industrial arts/technology education (IA/TE) teachers;
- other community personnel;
- a college/university professor.

In order of rank, those factors most commonly noted by the respondents in the study included:

- personal interests or hobbies;
- taking a high school IA/TE course;
- admiration of a high school IA/TE teacher;
- extra-curricular IA/TE activities;
- encouragement by a high school IA/TE teacher.

Developing a model of influence

Factors that influence career decisions (such as the decision to become a technology teacher) revolve around motivation, planning and consistent behaviour. 'Attitude' is a construct that has been developed to explain consistency in human behaviour (Myers, 2007). Attitude is believed to involve two components: beliefs about the object of the attitude, and feelings toward the object of the attitude (Westen, Burton & Kowalski, 2006). It has been argued that individuals can hold attitudes long before they have the opportunity to indulge in the related behaviour (Fishbein and Ajzen, 1975 and later Ajzen, 1988; 2000). These authors propose that an 'intention' to behave can be a mediating variable between the attitude and the behaviour. They also argue that attitude does not arise in a vacuum. The beliefs and feelings that crystallize into the attitude are shaped by background factors that include social interactions, age and maturation and prior experience. This leads to a causal relationship in which the background factors shape a cohesive set of beliefs and feelings which in turn creates an intention to act that sets in motion behaviours that lead to the ultimate goal (see Figure 1). This model

will provide a structure that can be employed in an examination of career choices.

RESEARCH

Questions and significance of the study

The present study employed the above concepts to examine those factors that influenced pre-service teachers to choose to become TAS teachers in Australian schools. The study developed and tested a causal model of influence that identified and weighted those factors related to a 'desire to become a teacher of technology'. Specifically, the following research questions guided the collection of data in this study:

1. What are the basic demographic characteristics of the Australian population of pre-service technology teachers?
2. What factors influence individuals to select, and enrol in technology teacher education programs?

These questions are significant, since the data gathered contribute to an educational knowledge base concerning the clients served by TAS teacher education. Further, by providing such a knowledge base, the study aimed to develop insights about the background of potential undergraduates and hence suggest directions for the marketing of technology teacher education. At a time of technology teacher shortage, the study appears both timely and relevant.

Methodology

Data were collected by a questionnaire that was forwarded to eight tertiary institutions for distribution to technology education students. All data were returned by mail. The questionnaire was based on an instrument employed by Wright and Custer (1998) in the USA. However, items were reworded to make them suitable to the Australian setting and some additional items were included. Section 1 of the questionnaire consisted of 28 attitudinal items set against a four-point Likert scale. These items probed the social influences that contributed to an individual's decision to become a technology teacher. Section 2 of the questionnaire sought demographic information from the respondents.

The SPSS statistical package was used; employing cross-tabulations with chi-square (using a one-tailed test of significance), factor analysis, correlation, analysis of variance and finally multiple linear regression analysis to test the model of influence (Coakes & Steed, 2001). It was assumed that the causal model to be employed in this study (see Figure 1) was unidirectional, and the variables included were cumulative. As such, the model complied with Pedhazur's (1982) criteria for the use of multiple linear regression analysis to weight the various dependencies of the postulated model. The study was approved by the Avondale College Human Research Ethics Committee. Eight tertiary institutions (stretching from Perth to Brisbane) offering undergraduate degree programs in technology teacher education agreed to participate in the study. Their TTEP enrolments, at the time of the study, numbered 833 students.

FINDINGS

Response rate

In total, 824 questionnaires were distributed and of these 365 were completed and returned, giving a 44% return rate. A small number, 28 responses, was excluded because critical demographic data were missing. The remaining 337 respondents represented just over one third of the 833 pre-service teachers enrolled in the participating universities. The sample constituted an appreciable proportion of the total population of pre-service technology teachers across Australia and thus could be regarded as being a representative sample of those preparing to be secondary school TAS teachers.

> *"Respondents represented just over one third of the 833 pre-service teachers enrolled in the participating universities"*

The respondents

Of the 337 respondents, 240 were male and 97 were female. Their ages ranged from 17 to 53 years (see Table 1). More than half were aged 25 years or younger and older respondents tended to be male rather than female. Respondents in the first year of their course totaled 129; 100 were in the second year, 61 in the third year and 46 were in their final year of study. In addition, 133 respondents

Figure 1: The four-stage model of influence linking background factors to behaviour

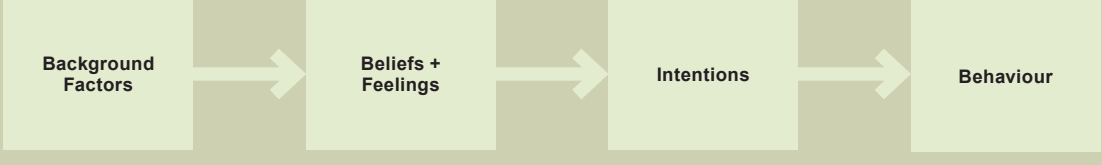


Table 1: Respondents grouped according to age, gender and year of course

Age	Year 1		Year 2		Year 3		Year 4		Gender Totals		Age Totals
	M	F	M	F	M	F	M	F	M	F	
20 years or less	41	23	25	19	12	12	2	1	25	19	135
21-25	16	4	15	5	14	10	9	6	15	5	79
26-30	11	1	6	1	1	1	4	0	6	1	25
31-35	10	1	15	1	4	3	10	0	15	1	44*
36-40	9	1	5	3	0	0	8	0	5	3	26
41-45	7	0	4	1	1	0	2	0	4	1	15
over 45	4	1	0	0	2	1	4	0	0	0	12
Gender Totals	98	31	70	30	34	27	39	7	240	96	336*
Year Totals	129		100		61		46		336*		

* One female respondent in the 31-35 age group did not indicate a year of course.

> *At a time of technology teacher shortage, the study appears both timely and relevant*

indicated that they came from rural backgrounds and 204 came from urban settings (Table 2). Males were more likely to come from rural areas than were females ($c^2 = 6{\cdot}6$; $p \leq 0{\cdot}05$) and older male respondents were more likely to come from rural areas than were their younger counterparts ($c^2 = 17{\cdot}0$; $p \leq 0{\cdot}05$). Given that 70% of Australia's population lives in urban regions (Australian Bureau of Statistics, 2000), males coming from rural regions were over-represented in the study.

A closer examination of Table 2 reveals a pattern in frequencies and ages that indicates two 'waves' of entry into technology teacher education (see Figures 2a and 2b). The first wave comprised those who entered technology teaching courses directly from, or soon after, their high school years and who could be regarded as commencing their first career. The increase in the number of students at around age 30 indicates the onset of the second and smaller wave. This wave might represent those who were making a career change.

In total, four in every five respondents completed their final year of secondary school before entering a technology teacher education program (Table 3). However, the percentages of those who did not complete their final year of secondary school rose within each successive age group, until by 45 years or over, approximately two thirds of those undertaking the TTEP did not complete Year 12.

A total of 125 respondents (66 males and 59 females) entered their study programs directly from secondary school (Table 4). Tables 5 and 6 indicate that women were more likely than men: to be younger ($c^2 = 26{\cdot}6$; $p \leq 0{\cdot}05$); to have completed year twelve ($c^2 = 38{\cdot}2$; $p \leq 0{\cdot}05$); to have entered the course directly from school ($c^2 = 32{\cdot}7$; $p \leq 0{\cdot}05$) and to have become interested in technology teaching while at school ($c^2 = 22{\cdot}4$; $p \leq 0{\cdot}05$). On the other hand, men were more likely to have been in the workforce ($c^2 = 26{\cdot}77$; $p \leq 0{\cdot}05$) and to have had experience in a technical trade ($c^2 = 28{\cdot}39$; $p \leq 0{\cdot}05$).

Development of attitudinal scales

Data elicited by the twenty-eight attitudinal items

Table 2: Age, gender, and rural/urban origin of respondents

Age	Rural		Rural Totals	Urban		Urban Totals
	M	F		M	F	
20 years or less	37	18	55	43	37	80
21-25	14	6	20	39	20	59
26-30	10	0	10	12	3	15
31-35	18	2	20	21	4	25
36-40	14	1	15	8	3	11
41-45	10	0	10	4	1	5
over 45	2	2	3	8	1	9
Total	105	28	133	135	69	204

Figure 2a: Age-gender frequencies of respondents

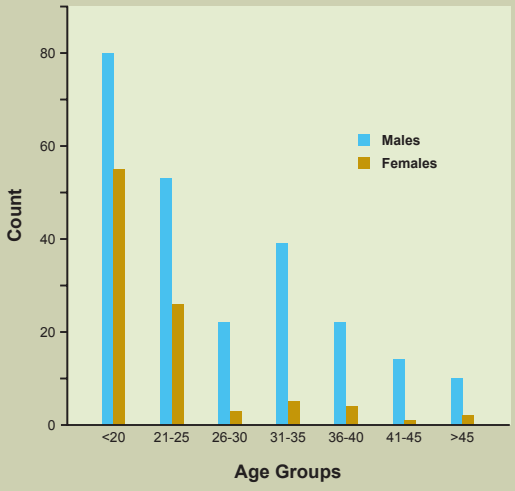


Figure 2b: Rural / urban origin of respondents

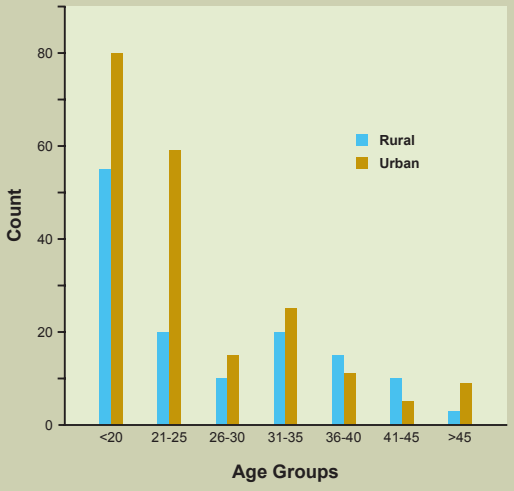


Table 3: Secondary school exit frequencies of respondents

Age	School Exit			Total
	Yr 10 or Earlier	Year 11	Completed Yr 12	
20 years or less	0	1	134	**135**
21-25	3	5	71	**79**
26-30	8	4	13	**25**
31-35	9	4	32	**45**
36-40	11	1	14	**26**
41-45	9	1	5	**15**
over 45	8	0	4	**12**
Total	**48**	**16**	**273**	**337**

Table 4: Experience of respondents prior to enrolling in Technology teacher education programs

School Exit	Direct from Secondary School		Through TAFE		Other University Courses		From the Workforce		Other		Total
	M	F	M	F	M	F	M	F	M	F	
Exited at or Before Year 10	0	0	2	0	0	0	44	2	0	0	**48**
Excited at Year 11	0	0	1	1	0	0	12	2	0	0	**16**
Completed Year 12	66	59	11	4	14	4	88	24	2	1	**273**
Gender Totals	**66**	**59**	**14**	**5**	**14**	**4**	**144**	**28**	**2**	**1**	**337**
Year Totals	**125**		**19**		**18**		**172**		**3**		

> *Respondents perceived the effects of 'School influence' in varying ways*

were subjected to exploratory factor analysis. An eigenvalue-factor plot (scree graph) indicated the presence of three factors. In order to obtain independent scales, principal component factor analysis with varimax rotation was employed (Kline, 1994; Loehlim, 1998). Items with negative loadings were recoded and the intent of each associated statement was reversed. The independence of the scales was strengthened by removing items with loading values of less than 0·35 (Ewert & Sibthorp, 2000), and also by removing items that loaded onto two or more factors with loading differences of less that 0·20 (see Kerlinger, 1973). Item removal was carried out individually and the values of coefficient alpha for each scale were monitored to ensure that the removal process did not unduly reduce factor reliabilities.

Initially, the three factors accounted for 37% of the variance that would have been obtained if all 28 items were treated as individual factors. After pruning, the variance associated with the three factors rose to 50% of the total variance. The final item loadings on each of the three factors can be seen in Table 7. The first factor included eight items that collectively conveyed community support for a respondent's decision to enrol in technology teacher education. This factor was labeled 'Community Influence' and had a coefficient alpha of 0·77. The second factor included five items that collectively conveyed the influence upon a respondent's decision to enrol in technology teacher education emanating from their experience at school. This factor was labeled 'School Influence' and had a coefficient alpha of 0·76. The third and final factor comprised four items that described the respondent's interest in becoming a teacher. This factor was labeled 'Desire to Teach' and had a reliability of 0·74. Since each of the coefficient alphas exceeded 0·7 they could be deemed sufficiently reliable for the purposes of this study (see Nunnally, 1978; p245).

The scores of the respondents on each of the three scales were obtained by averaging their declared Likert weightings across the items within each scale. This meant that the scale score for each respondent lay within the bounds of the Likert weightings and thus the descriptors of the Likert scale were employed to interpret the scale scores for the respondents (see Figures 3a to 3c). In general, the respondents perceived 'Community Influence' as having minimal impact upon their decision to become a technology teacher. However, the scale scores were strongly skewed, meaning that a small number of respondents perceived 'Community Influence' as playing an important part in their decisions.

This situation was very different for the measures obtained by the 'School Influence' scale. Here the median (2·4) lay very close to the center of the Likert range with some scores reaching to one or the other extremity. This means that respondents perceived the effects of 'School Influence' in varying ways. For some it was influential, but an approximately equal number viewed the influence of school as of little effect on their decision to become a TAS teacher. The nature of the scores on this scale are better understood when the relationship between the variables 'Age Group' and 'School Influence' is examined. Figure 4 presents the results of an analysis of variance involving these two variables and indicates that measures of 'School Influence' steadily decline with increasing age. This is to be expected as the memories and the impact of school fade and new experiences become more prominent.

The final scale, 'Desire to Teach' returned a median of 3·3 indicating that a majority of respondents were undertaking Technology Teacher Education because they wanted to become a teacher of technology. However the measures elicited by the scale were negatively skewed indicating that some respondents (likely to be only a few) may have been undertaking the course for reasons other than the desire to teach.

Relationships indicated by correlations: Consistency within the data

The correlation table (Table 8) includes a selection of correlations whose magnitude exceeds 0·20. This represents only 4% common variance and hence, although correlations with smaller magnitude exceed the 0·05 level of significance, they do not imply any meaningful relationships. The correlations shown in the table provide evidence of a certain level of cohesion within the data, i.e. the data 'hang together' and are consistent with informed expectations. For example, older respondents tended: to be male (r = -0·25); to have grown up in working class homes (correlations between age-group and parents' ranked employment are respectively r = -0·34 and r = -0·21); to have left school before year 12 (r = -0·54); to have been in the work force immediately prior to enrolment (r = 0·63); to have had trade experience (r = 0·49); to be retraining for purposes of job security (r = 0·53); to have become interested in technology teaching in the work place (r = 0·54); and to have been minimally influenced in their decision to take up technology teacher education by their experience at school (r = -0·49).

On the other hand, women enrolled in technology teacher education tended: to be younger (r = -0·25); to have become interested in technology teacher education in school or in another place of education (r = -0·21); to have been studying immediately prior to enrolment (r = -0·32); to have no experience in a trade (r = 0·30) and to have indicated that their

Table 5: Respondents' school exit against trade background/experience

School Exit	Trade Background				Total
	No Prior Trade Experience		Prior Trade Experience		
	M	F	M	F	
Exit at or Before Year 10	15	1	31	1	**48**
Exit at Year 11	7	0	8	1	**16**
Completed Year 12	132	89	47	5	**273**
Gender Total	**154**	**90**	**86**	**7**	**337**
Total	**244**		**93**		

Table 6: Respondents' reported place of initial interest in Technology teacher education

Gender	Location / Environment				Total
	School	TAFE	University	Workforce	
Males	95	22	18	105	**240**
Females	66	5	5	21	**97**
Total	**161**	**27**	**23**	**126**	**337**

Table 7: Item loadings on each factor as a result of factor analysis with varimax rotation

Scales + Items		Factor Loadings		
		1	2	3
"Community Influence" (Alpha = 0.77)				
17	Encouraged by other community personnel	0.70		
16	Encouraged by a community professional	0.66		
13	Encouraged by other university personnel	0.66		
12	Encouraged by a university Technology education lecturer	0.64		
15	Encouraged by university students	0.59		
19	Encouraged by a youth leader	0.59		
18	Encouraged by a church leader	0.54		0.20
"School Influence" (Alpha = 0.76)				
17	Encouraged by a high school Technology teacher		0.80	
17	Admired a high school Technology teacher as a role model		0.77	
17	Encouraged by parents	0.23	0.67	
17	Enjoyed secondary school Technology courses		0.67	
17	Encouraged by high school classmates	0.26	0.61	
"Desire to Teach" (Alpha = 0.74)				
17	Like working with high school students			0.79
17	Like teaching others special skills			0.76
17	Enjoy creating / assisting others to create		0.21	0.70
17	Wanted to be a teacher			0.68

experience at school influenced their decision to enter technology teacher education (r = 0·24).

Those claiming to be retraining for job security tended: to be male (r = -0·20); to be older (r = 0·53); to have left school before completing year 12 (r = -0·40); to be retraining for an increase

Figure 3a: Box plot for measures on the 'Community Influence' scale

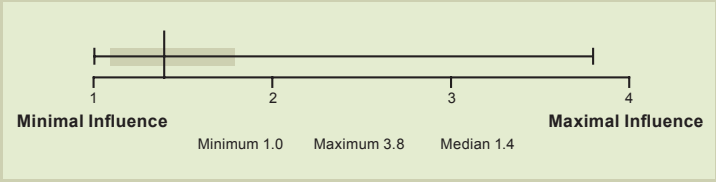


Figure 3b: Box plot for measures on the 'School Influence' scale

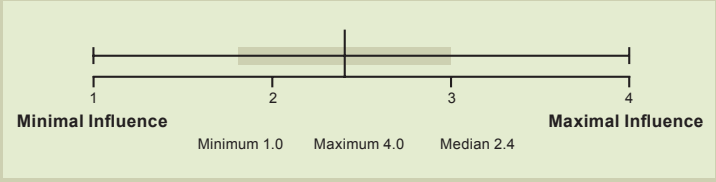
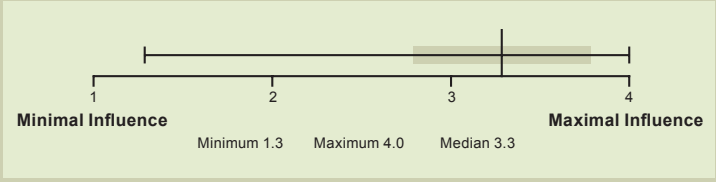


Figure 3c: Box plot for measures on the 'Desire to Teach' scale



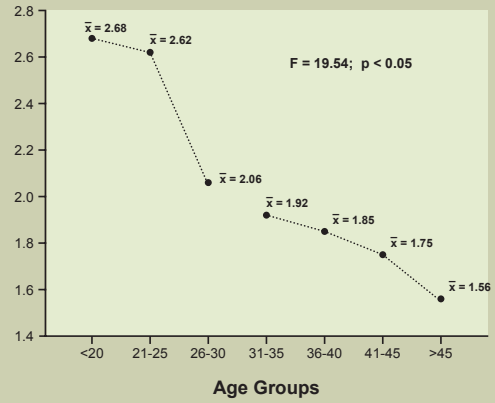
in the likelihood of employment (r = 0·35); to have been encouraged by personnel in industry (0.37); to have become interested in technology teacher education in the work place (r = 0·34); to have come directly from the workforce into technology teacher education (r = 0·50); to have trade experience (r = 0·52); to have been minimally influenced in their decision to enter technology teacher education by their experience at school (r = -0·27) and to have been influenced in their decision to enrol in technology teacher education courses by members of their community (r = 0·20).

Finally, the desire to become a technology teacher was influenced: by interests and hobbies before enrolment (r = 0·27); by experiences at school (r = 0·20) and by persons within the respondent's community (0·24).

Determining the dependencies of the model of influence

The path model to be tested is shown in Figure 5.

Figure 4: Effect of age upon "School Influence"



It includes a listing of the variables entered into the respective regression processes. The variables listed in this model include a single ultimate dependent variable, 'Desire to Teach', four mediating variables, 'Increased Likelihood of Employment', 'Interests and Hobbies', 'School Influence' and 'Community Influence' and five background variables, including 'Rural/Urban Background', 'Gender', 'Age-Group' and 'Parental Employment'.

All variables were entered into the regression process as z-scores. This ensured that the regression equations had zero constants, thus allowing the beta coefficients to directly indicate the proportions of variance within the dependent variable that were contributed by the respective independent variables (see Kerlinger, 1979; Loehlin, 1998; Pedhazur, 1982). Since 'Desire to Teach' was the ultimate dependent variable in the path model, it was made the first dependent variable in the multiple linear regression process. All other variables were entered as independent variables and the backward stepwise method employed. This method removed those variables which did not meet the 0·05 level of significance and which therefore contributed least to the variance of the dependent variable (Loehlin, 1998; Coakes & Steed, 2001). Each one of the four mediating variables was then successively made the independent variable for the backward stepwise process in which the background variables were the independent variables.

The results of these regression processes are found in Table 9 and have been set out in the path diagram in Figure 5. Only 15% of the variance of 'Desire to Teach' is explained by variables within the model, leaving 85% of its variance to be related to factors external to the model.

Implications of the model

The final path diagram is shown in Figure 6. 'Interest and Hobbies before Enrolment' is the strongest influence on a 'Desire to Teach' technology subjects (b = 0·27). 'School Influence' and 'Community Influence' contribute to a lesser degree (b = 0·17 and b = 0·17 respectively). The variable 'Community Influence' is unsupported by any of the background variables. In other words, support for the decision by members of the community is independent of the urban/rural background, sex, age or socio-economic status of the respondent. The model suggests that 'School Influence' is stronger if the respondent is younger (b = -0·47), generally female (b = 0·13) and generally from an urban setting (b = -0·10). To a lesser extent, 'Interest and Hobbies before Enrolment' was related to being female (b = 0·11) and having fathers with higher socio-economic status (b = 0·18). This latter factor may well be linked to disposable income that can allow children, and particularly daughters, to indulge in meaningful hobbies of a technical nature. While the influence of school experiences (b = 0·27) is considerably stronger in younger respondents, older respondents generally show a greater desire to become a technology teacher (b = 0·18).

There is a minor interplay between 'Gender', 'Urban/Rural Origin' and 'Age-Group'. Firstly, there were two and a half times as many males in the sample as females, and while the males spanned the age-range, females tended to be younger, and in comparison to their male counterparts, appeared to be from urban settings. Since the younger respondents were more strongly influenced by their school experience, female respondents from urban settings appeared to predominate among those who related their choice of technology teaching to their school experience.

Conspicuous by its absence from the model, is the variable, 'Retraining for Job Security'. This variable shows moderately strong correlations with an array of other variables and yet it is not linked to 'Desire to Teach'. The implication is that while the need to retrain is important, it is not a distinct motivating factor related to entry into the profession of technology teaching.

Discussion, Conclusions and Recommendations

The 337 respondents came from eight different tertiary institutions across Australia. Because they comprised an appreciable proportion of the total number of pre-service teachers enrolled in TTEP, it can be assumed that they represented the larger population. Further, the pattern of correlations within the results is cohesive and logical, suggesting certain validity within the results themselves.

These results suggest that the undergraduate students enrolled in technology teacher education in Australia are a diverse group. Forty percent of them come from rural areas and this group is disproportionately male. Almost a third are over the age of 30 years and therefore can be considered to be making career changes. More than a quarter have trade backgrounds, while just over a third are entering technology teacher education directly from school. This of course is a general picture and differing bodies of pre-service technology teachers will exhibit differing demographic characteristics from university to university. This diversity among pre-service technology teachers suggests a variety of student needs and thus implies a need for special planning behind, and variety within, curriculum offerings. It suggests that there should be a variety of appropriate teaching and learning strategies as well as flexible delivery and assessment procedures.

Two factors related to a desire to become a technology teacher are: hobbies and pursuits of special interest, and the influences of school. This latter factor included items representing the presence of 'admired teachers', and the 'encouragement by teachers' for students even to dare entertain the idea of becoming a TAS teacher. This has real implications for the way innovative and caring teachers can use the curriculum and the classroom environment to shape the career prospects of their students. A disciplined, safe, and pleasant environment in which a teacher forges a relationship of trust and respect, and where a student can pursue projects of special interest that engage the mind and develop appropriate skills, can both fuel and prolong the desire on the part of a student to emulate the teacher's role.

> ***"Innovative and caring teachers can use the curriculum and the classroom environment to shape the career prospects of their students"***

The data suggest there are three distinct groups within the population of pre-service technology teachers. The first group is retraining for a career change into technology teaching. This group is comprised, predominantly, of older males with trade experience and who also have a tendency to be from a rural background. They have chosen to enter TTEP for reasons related to increased job security and because they have a desire to become technology teachers. The second group is composed of young females from urban backgrounds who tend to enjoy interests and hobbies that are linked to technology. They have entered TTEP direct from school and have been influenced by their school experiences to become technology teachers. The third and final group are males aged in their twenties who were likely to have been influenced (generally, but not specifically) to become technology teachers by interests in hobbies and by the influence of their experiences with TAS at school.

These findings have implications for marketing

Table 8: Bivariate correlations of a selection of variables employed in the study

		i	ii	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	xiv
i	Interests / hobbies before enrolment	1.00													
ii	Encouragement by industry personnel		1.00												
iii	Retraining for job security		0.37	1.00											
iv	Increased likelihood of employment			0.35	1.00										
v	Employment of mother					1.00									
vi	Employment of father					0.33	1.00								
vii	Gender (male=1)			-0.20				1.00							
viii	Age			0.53		-0.34	-0.21	-0.25	1.00						
ix	Point of exit from school			-0.40					-0.54	1.00					
x	Place became interested (school=1)			0.34				-0.21	0.54	-0.30	1.00				
xi	Place prior to enrolment (school =1)		0.24	0.50		-0.23		-0.32	0.63	-0.38	0.62	1.00			
xii	Experience in the trade		0.22	0.52				0.30	0.49	-0.42	0.37	0.55	1.00		
xiii	Desire to become a Technology teacher	0.27												1.00	
xiv	School influence	0.24		-0.27				0.24	-0.49	0.25	-0.50	-0.43	-0.32	0.20	1.00
xv	Community influence		0.31	0.20										0.24	0.25
		i	ii	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	xiv

Figure 5: Variables as entered into the regression analysis

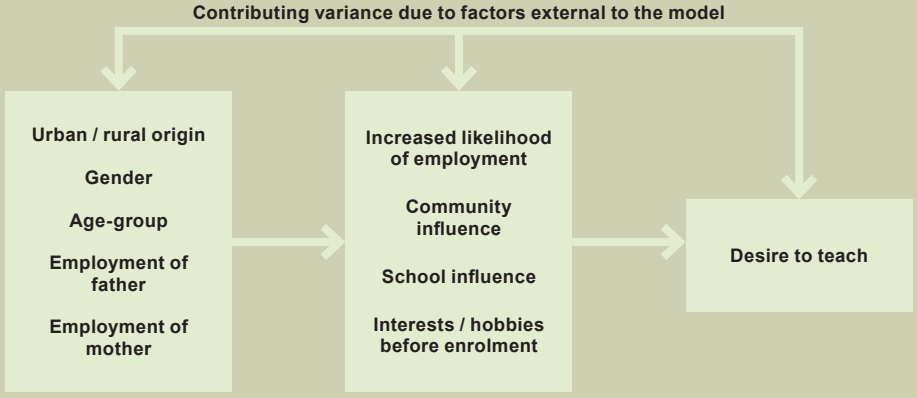
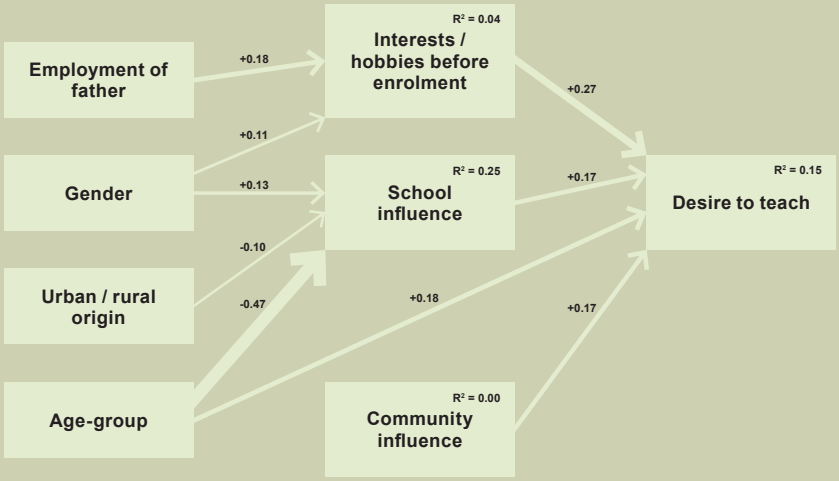


Table 9: Dependencies of the model of influence as they resulted from regression analysis

			1.645X standard	
Dependent variable	**Independent variable**	**Beta**	**Error**	**R^2**
'Desire to teach'	School influence	0.17	0.11	0.15
	Community influence	0.17	0.10	
	Age	0.18	0.12	
	Interests / hobbies before enrolment	0.27	0.10	
'School influence'	Rural / urban	-0.10	0.08	0.25
	Age-group	-0.37	0.09	
	Gender	0.13	0.08	
'Community influence'				
Interests / hobbies before enrolment	Gender	0.11	0.09	0.04
	Employment of father	0.18	0.09	

Figure 6: Dependencies of the path model related to 'Desire to teach'



campaigns geared to increase the number of TTEP entrants. Campaign strategies should target the three distinct groups of potential technology teachers and thought needs to be given to the delivery of focused messages. It might be extrapolated that the latter should be short, thoughtful and contemporary, and make use of all current means of communication to make an impact.

To the older, experienced and skilled males, TAS teaching should be represented as:

- a means of continuing the involvement with old and loved skills;
- a means by which these existing skills can be shared with young people, while contributing to their development;
- a secure, enjoyable, satisfying and respected occupation;
- a means of obtaining a comfortable living in a rural setting.

To reach young, urban females, marketing strategies should show-case TAS teaching as:

- appealing to the young, independent female;
- a well-paid profession;
- a great, enjoyable and respected career option;
- an exciting feature of city living;
- a means of emulating an admired teacher;
- continuing enjoyment of the technical subjects to which they were introduced at school;
- continuing the development of the skills of loved hobbies and past-times.

To have an impact on young males, messages should:

- deliberately target the young, but mature and free male image;
- represent technology teaching as a well-paid profession;
- represent technology teaching as a great, enjoyable and respected career option;
- feature both city teaching and the adventure of rural teaching;
- feature the continued enjoyment of technical subjects, to which they were introduced at school;
- place emphasis on continuing the development of the skills of loved hobbies and past-times.

The authors, having put forth some practical recommendations, propose an additional strategy: More secondary students would be attracted to technology teaching if the pool of students taking technology subjects in senior secondary school was to be increased. For this to occur, students must see a linkage between school subject offerings and general and viable career options through either TAFE or University. The strengthening of the TAFE-school link could be one means of increasing the number of secondary school students considering the TAS area as a serious career option.

To amplify the appeal of technology teaching as a career option, career advisers and teachers of technology in secondary schools need to unite their efforts to promote technology teaching as a secure, rewarding and appropriate career option. Perhaps safety should not be the only concept featured on posters in technology classrooms. Students, openly, should be made aware of the possibility that they, too, could become teachers of technology in a secondary school.

Within the model of influence, only 15% of the variance of the dependent variable 'Desire to Teach' related to endogenous factors. The remaining 85% of variance came from factors external to the model. Further, technology teaching covers a 'wide' field in

> ***"Career advisers and Technology teachers need to promote technology teaching as a secure, rewarding and appropriate career option."***

which technology subjects differ from state to state. No attempt was made by the study to examine the influence that individual technology subjects may play in determining a desire to become a technology teacher. Hence there is room for additional research, employing a greater number of respondents and a broader scope of questionnaire items.

In conclusion, it is the authors' hope that the specific insights and understandings resulting from this study have added to the knowledge base about technology education, suggested directions for effective marketing and promotion and, perhaps, in a small way contributed to reversing the technology teacher shortage in Australia. TEACH

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