

Proposing a comprehensive model for identifying teaching candidates

Terry Bowles · John Hattie · Stephen Dinham ·
Janet Scull · Janet Clinton

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Abstract Teacher education in universities continues to diversify in the twenty-first century. Just as course offerings, course delivery, staffing and the teaching/research mix varies extensively from university to university so does the procedure for pre-service teacher selection. Various factors bear on selection procedures and practices however few university courses have rigorous testing procedures for candidate selection. Further, there has been an over-reliance on grade scores and interview as preferred selection methods. A method of selection based on a comprehensive and broad spectrum set of tests and questionnaires is proposed on which to base selection. We suggest that a model comprised of previous achievements, tests of ability and reasoning, self and social interaction are the best indicators and that scores on these factors should be taken into account to provide valid and reliable data on which to make good decisions when selecting candidates.

Keywords Entry testing · Teacher selection · Teacher candidates

Introduction

In this paper a comprehensive model of teacher entry is proposed that encompasses the most common methods of selection into teacher education programs. We propose a comprehensive model mainly to highlight the need for further research and better understanding of the link identification and selection has with course participation, graduation and entry to the profession. Another aim is to challenge and inform assumed practices and prompt consideration and debate about teacher selection processes. We maintain that generic and/or minimal practices of selection are no longer sufficient for matching the appropriate students to specific courses in

T. Bowles (✉) · J. Hattie · S. Dinham · J. Scull · J. Clinton
University of Melbourne, Parkville, VIC, Australia
e-mail: tbowles@unimelb.edu.au

teacher education. Education students currently face a number of challenges given the complexities of teacher training (Shuls and Ritter 2013), advances in the profession (Boe et al. 2007), challenges to teaching practice in Australia (Dinham 2013; Hattie 2011; Ingvarson 2012), best practice overseas (Darling-Hammond 2006) and in selection processes in comparable professions (Edwards et al. 2012; Prideaux et al. 2011). We acknowledge that the processes we advocate are contentious and form a small part of a much larger national and international debate about the role of testing and teacher quality, exemplified by arguments from Kane and Darling-Hammond (2012). Thus we aim to problematize teacher selection in particular and draw attention to this uncritically accepted, often ill-fitting and ill-explained procedure by outlining a complex model of teacher selection.

Just as there are and should be multiple pathways to teaching (Shuls and Ritter 2013) correspondingly there should be multiple methods for selection and an evidence base for their use. To date there is little evidence justifying the use of any selection method. The current methods are largely practical and minimal (for example, a rank such as the Australian Tertiary Admission Rank), and in the absence of research sometimes there is an accompanying philosophical basis ('we select students from low SES backgrounds') or a belief system supporting the process ('we can take anyone into our course and they will meet the standard on exit'). Such approaches and claims are untested and research indicating their veracity is necessary. Further, there are a number of institutions that use various approaches, but there is little commonality between institutions (Edwards et al. 2012) and the major features and factors measured in these approaches remain free of a strong evidence base or theoretical framework (Prideaux et al. 2011). In response we propose a model and explanation to promote debate, evaluation and to prompt future research.

The specific nature and purpose of the selection process also requires clarification. We suggest that Deans of Education and institutions need to define the types and characteristics of students required for the program(s) they offer and develop standards for selection, not unlike the process recommended for setting standards in teaching (Ingvarson 2012). Next, the factors on which students should be selected, in line with the course and its aims, should be identified. Development of consistent and valid methods for measuring the factors follows. Next, the standards required to be achieved on each factor need to be identified. Indicating which factors of selection relate to student behaviour in the teacher education program, and which factors relate directly to professional teaching needs to be identified. If, as we argue, teacher education programs are formative then the major part of the selection process is the suitability to the course and indirectly, and consequentially, related to future professional teaching.

In Australia, testing for teaching occurs at the end of the teacher training program to meet the Australian Institute of Teaching and School Leadership (AITSL) standards. The current separate selection processes are shown in Fig. 1. The feed-forward is shown by the arrows beginning with the teacher selection procedure and criteria and leading eventually to the practice of graduates. The feedback process subsequently informs each of the selection procedures, selection criteria, course content and consequently impacts graduation, professional standards and student's

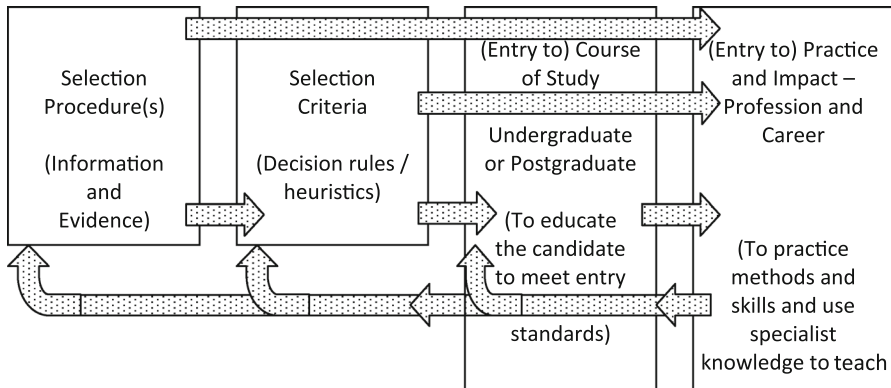


Fig. 1 The selection process in relation to course of study and entry to the career and profession

evaluation and review over time. Focusing specifically on the processes relevant to the selection procedures, in this paper we expand on the current teacher selection process and describe a comprehensive model of a variety of factors relevant to teacher selection and how such a model may be applied.

Developing more comprehensive recruitment procedures, selection procedures and criteria to meet the challenge of improving graduate experiences and graduate outcomes in teacher education programs is now paramount. Improving the selection of student teacher candidates and improving the fit to study teaching and tertiary education will maximize the chances of a graduating teacher candidate who is more effective in the classroom and who is more likely to want to stay in the profession (Dinham 2008a, b). As more than 30 % of Australian students entering university do not complete their course, and a further 30 % do not remain in the profession after 3–5 years, there can be high personal and institutional financial costs associated with poor selection (Productivity Commission 2012). There is also a need to provide selection procedures that respond to the needs of identified equity and under-represented groups and people from diverse educational backgrounds (Department of Education Employment and Workplace Relations (DEEWR) 2008; Edwards 2008).

Traditionally, entry to university teacher education courses has been based on some form of secondary achievement ranking, most recently as expressed through the ATAR. However, there are concerns over both the widening range of ATAR scores required for entry to teacher education and with the efficacy of this measure in predicting tertiary success. There is also the issue of regional/remote disadvantage which depresses ATARs. Additionally, with an increasing proportion of teacher candidates undergoing graduate teacher education programs, the use of ATARs as an entry measure becomes less relevant as the ATAR entry requirement lowers. Finally, in recent times there have been new public and private colleges offering teacher education, with a range of entry requirements and graduate expectations (Dinham 2013).

In response to concerns over raising the quality of teacher education, pre-service courses and graduate teachers, the AITSL has introduced mandatory standards for program entrants, including that “levels of personal literacy and numeracy should be broadly equivalent to those of the top 30 % of the population” (AITSL 2011b: 13).

More recently there have been moves to introduce entry and/or exit tests of teacher capabilities from both AITSL and other jurisdictions. Selection will thus become more complex in future as students come to university with differing backgrounds and capabilities while the demands on raising teacher standards grow. There is an anticipated increase in students attending university which will bring a variety of backgrounds and a broader range of capabilities possibly requiring adjustment of course content to better fit students' entry skills and competencies, as reflected in Fig. 1.

Despite the range of competencies at entry, students will need to meet higher standards at exit (Australian Government 2009). Importantly, tertiary education of teachers is responding to decades of policy related to national quality benchmarks, standardized levels of teacher quality, common outcomes for all Australian learners, and national quality initiatives, such as the Tertiary Education Quality and Standards Agency, the Australian Institute for Teaching and School Leadership (AITSL), the Australian Curriculum, Assessment and Reporting Authority and Education Services Australia (O'Meara 2011). Therefore it becomes important for Schools of Education to know the competence of each entering cohort of students and make appropriate adjustments so that standards can be maintained while students have a successful, formative experience while at university. The challenge to teacher education is to develop and research best practice to select students and consequently teachers who can fulfill the demands of an ever more complex occupation. Universities who knowingly accept students who do not meet minimum standards at entry have a greater duty of care to ensure the curriculum provides these students with the opportunities to meet minimum standards at exit. Not doing so raises ethical questions about the equity of participation and the cost to the student and the community. In this paper a model to improve student selection is proposed. The model proposed in this paper would identify those students who can most positively benefit from training programs, and to maximize the probability of them being successful and remaining in the teaching profession. For individual programs the model could be adapted to suit specific needs, arguments and assumptions for selection and adjustment of the course content.

The current problems of selection

Some common procedures for selection do not reflect the complexity of the task of studying teaching or practicing teaching, and do not respect current research and evidence on best practice for selection. Common methods for selecting candidates for teacher education include secondary education scores (undergraduate programs) and university grade point average (graduate entry programs). In many cases interviews are also used—although this can be problematic in very large faculties which can receive thousands of applications and consequently have too little time to interview effectively. Less frequently, standardized tests measuring maths and English achievement are used by a very few universities. Furthermore there is growing evidence that non-cognitive skills are not sufficiently respected or captured by standardized tests of educational and cognitive ability often used in the selection process and that other factors such as adaptability, self-restraint, self-efficacy, and motivation are significant in teacher's work quality (Borghans et al. 2008; Lindqvist

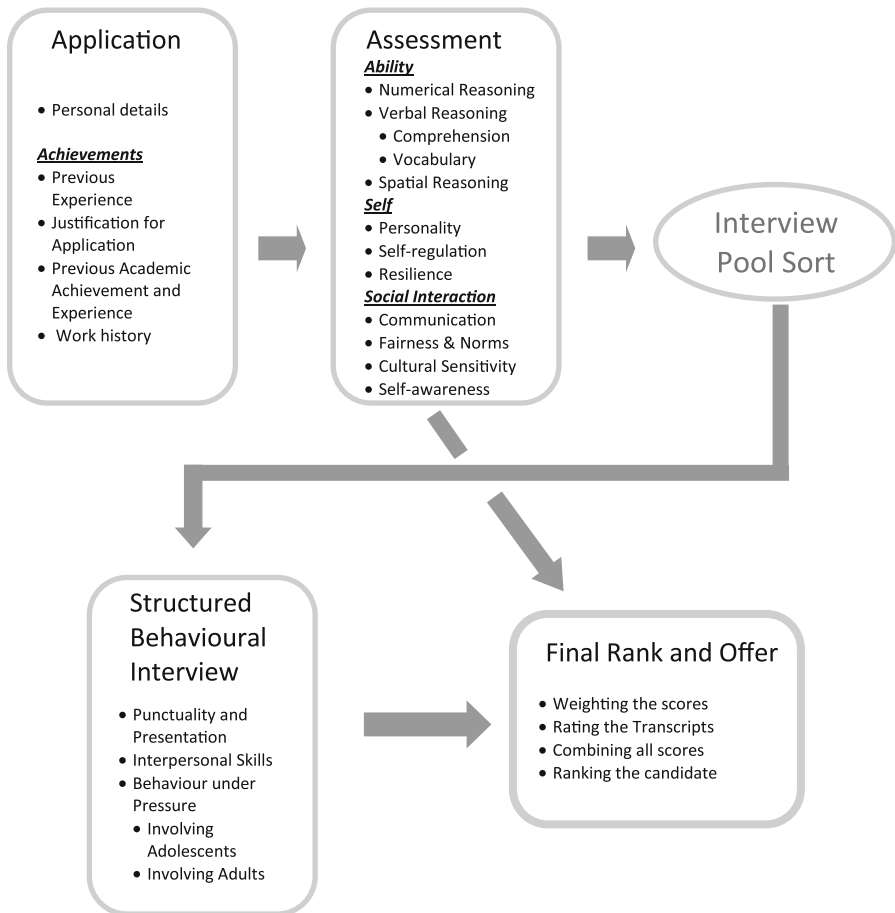


Fig. 2 The proposed model of student selection

and Vestman 2011). The aim of this paper is to propose a model that is comprehensive and provides a breadth of information on which selection procedures can be developed and to promote research into the appropriate methods for selection.

The argument in this paper is that improvement in teacher selection is possible by broadening the criteria and that appropriate selection of screening procedures and tools can provide better alignment between successful pre-service teachers and teacher graduates ready to work in schools. The proposed model is a multiphase approach reflecting evidence-based practice in selection. This is an important issue because previous selection procedures have not kept pace with procedures and practices in other industry sectors (Bore et al. 2009). The costs of making poor selection choices has many implications, in particular for applicants who may have made a poor choice of career, the students they subsequently teach and the community that bears much of the cost of education and the consequences of poorly educated students (Dinham 2013).

To date, no cohesive or comprehensive model grounded in research has been developed for pre-service teacher selection but does occur in comparable professions (Bore et al. 2009). Given available technologies, selection processes in other professions, the practical demands of selection to teaching programs, and the demands for improved teacher quality it is timely to begin development and validation of possible omnibus processes for selection of student teachers. Such comprehensive testing is not to identify great teachers but to identify the candidates who would gain most from involvement in the teacher education program and consequently become great teachers.

Our model of teacher selection is comprised of three phases: (1) the application phase, (2) the assessment phase, and (3) the structured behavioural interview (Fig. 2). Completing the three phases allows students to reflect as they engage, cognitively and affectively, to consider the factors salient for student teaching and teaching as a future profession (Ahearn et al. 2006). Following is a discussion and justification for these dimensions of the selection process.

Application phase

In the application phase, students are asked to provide information about their past and present aspirations associated with the application. Specifically they are asked to reflect on and answer questions related to previous experience relevant for pre-service teaching, a justification for applying, their educational experience and achievements, and prior work experience.

These questions provide an opportunity to prompt students to clarify their understanding of the task of studying teaching, their aspirations, and whether the qualities they have fit with being a teacher. The use of such thought provoking questions promotes reflection and informed selection which has been argued to be a valuable experience for candidates as it requires systematic articulation of intent while apprehending the tasks required (Bore et al. 2009). There is no requirement to provide personal or professional references as these have not been shown to be useful (Ferguson et al. 2002, 2003).

The written responses are coded for quality on three dimensions. First, the quality of the responses are assessed in terms of content—information about the candidate as a teaching student and teaching graduate and their knowledge, attitudes and beliefs about quality teaching. Second, the answers provide insights against the Australian Professional Standards for Teachers (AITSL 2011a, b). Third, the test can be analysed for literacy quality on a range of dimensions and provide information about the candidate's literacy competence (Harris 2009).

Assessment phase

A number of personal attributes and capabilities are assessed during the Assessment Phase. This phase provides most of the information associated with Ability, the Self and Social Interaction.

Ability

To complement and validate academic performance, a measure of general cognitive ability including numerical, verbal and spatial reasoning tasks is included (Bore et al. 2009). General cognitive ability has been shown to be a good predictor of occupational attainment performance (Brown et al. 2006). So, three components of cognitive ability are assessed to provide an indication of candidates' strengths and weaknesses, which are combined to provide an indication of the candidate's general ability level. General cognitive ability is related to job performance across sectors as well as completion and achievement level in tertiary study (Brown et al. 2006; Gottfredson 2002; Kuncel et al. 2001). The components assessed are numerical reasoning, verbal reasoning and spatial reasoning. Numerical reasoning is defined as the ability to complete mathematical calculations and number manipulations. Verbal reasoning refers to the ability to solve problems and understand information using language-based reasoning and is comprised of verbal comprehension and vocabulary. Comprehension is defined as the capacity to evaluate statements in response to a written passage. This assesses the candidates' ability to read, understand and synthesize complex text. Vocabulary is defined as the ability to select correct word definitions. The verbal reasoning components are time limited. Finally, spatial reasoning is a non-verbal, culture free measure of cognitive ability. Importantly, the ability test scores complement academic scores which may not be an accurate reflection of the competence of the student (for example, through the influence of illness or life opportunities).

Self

The measures of self include: personality (Costa and McCrae 1995), self-regulation (Kuhl and Kazén 2006; Schunk and Mullen 2013) and resilience (Pearce and Morrison 2011; Ones et al. 2007). Personality is known to have predictive validity and even if it only contributes a small variance it can still make a valuable contribution to selection (Bore et al. 2009). The most well supported model of personality is the big five factor model of personality (Costa and McCrae 1995), and it has been accepted as a valid means of informing decisions about career selection, student/program fit and future success in a teaching career (Jamil, Downer, & Pianta 2012). The big five factors of personality include: extraversion, conscientiousness, agreeableness, openness, and neuroticism. Extraversion is the tendency to be social, warm and energetic; Agreeableness is the tendency to show empathy, encourage cooperation, avoid conflict and easily work with others; Conscientiousness is defined as the disposition to be organized, committed and hard-working; Openness reflects the individuals' tendencies for creativity, free thinking and broad mindedness.; and Neuroticism is defined as the individuals' tendencies for emotional insecurity and sensitivity.

The big five factor model of personality has been used to predict job performance across a number of sectors (Rothstein and Goffin 2006; Goodstein and Lanyon 1999). Two factors consistently shown to relate to higher performance, particularly in jobs requiring social interaction such as teaching, are Extraversion and Conscientiousness. A number of studies involving teachers support this relationship

for teaching (Rockoff et al. 2011). Conscientiousness and Openness in particular are associated with higher levels of academic achievement, even when cognitive abilities are accounted for (O'Connor and Paunonen 2007).

In addition to personality, other measures of the self, such as self-regulation are relevant to teaching (Zimmerman 1990; Cassidy 2011). Self-regulation is important in occupations in which strain and stress is likely (Vohs and Baumeister 2010). This component assesses candidates' self-regulation skills which are the thoughts, feelings, and actions deliberately generated by an individual to achieve personal goals important for effective teaching practice (Duffin et al. 2012). Strong self-regulatory skills enable teachers to understand their students as learners and facilitate the development of students' self-regulatory strategies (Bernard et al. 2009; Toussi et al. 2011). We define self-regulation as goal setting, self and environment management (for examples, classrooms), task management, and self-evaluation. Goal setting is defined as setting goals that are realistic and achievable. Self and environment management is defined as selecting and creating supportive, productive work environments and acting with consideration of the consequences and learning from mistakes. Task strategies are defined as preparing for and planning tasks in advance and planning and managing time for tasks. Self-evaluation is defined as understanding where help is available and utilizing it when needed and seeking and utilizing feedback to improve. Self-evaluation, responding to feedback and applying evidence-based practice and procedures are critical for growth during studies and when practicing as a teacher (Dinham 2008b; Hattie 2011; Hattie and Jaeger 1998).

Resilience is the third 'Self' construct included in the battery as it has also been suggested that resilience is necessary for success in teacher education courses and also in teaching (Pearce and Morrison 2011; Tait 2008). Teachers face a number of stressors including behaviour management, time pressures, workload and unsupportive leadership (Beltman et al. 2011). High levels of attrition and burnout, particularly in early career teachers, are a testament to this (Howard and Johnson 2004). The resilience component assesses candidates' capacity to cope with challenging situations and overcome adversity. The factors that make up resilience are known to protect against stress and promote adaptive responses in the face of challenges. There are four factors associated with resilience: persistence, defined as continuing to be determined in the face of difficulty; optimism, defined as perceiving the future, and difficult situations, in a positive manner; ability to rebound after difficult experiences is defined as quickly and easily recovering from challenging situations and experiences; and care for oneself is defined as proactively and consciously acting to maintain and improve health.

Social interaction

Social Interaction factors are essential to teachers and relevant to most work places, so we defined it as including: communication style (Bowles 2010; Munro 2008; Webster 2010), fairness and norms (Johnson 2008; Johnson and Reiman 2007a, b), cultural sensitivity (Castro 2010) and self-awareness (Bore et al. 2009; Hahn 2005). These factors have been incorporated because they have been reported to improve capabilities for teachers as well as being relevant for effective postgraduate learning (Hattie 2008).

Clear communication is central for the appropriate and efficient transfer of information. Efficient information transfer as well as respect for the humanity and capabilities of those being taught makes the task of communicating even more complex (Bowles 2010; Munro 2008; Webster 2010). Further, teachers function in environments that demand leadership, conflict resolution, collaboration, trust and respect. Leadership is defined as the preference to lead others in a strategic manner. Conflict resolution is defined as maintaining positive relationships and using strategies to resolve conflict. Collaboration is defined as the disposition to work cooperatively with others to create the best outcomes. Trust and respect is defined as having confidence in and respect for others.

The second dimension called social interaction is the need to behave fairly. Fairness and norms measure the values of the individual when making and evaluating ethical decisions and actions. In the classroom, the teacher often balances the needs of the individual with those of the group. Moreover, the teacher maintains relationships with students, while following school policies and the teacher's own expectations of student behaviour. Acting in a democratic and fair manner is important for student teacher and teacher success and is assumed to be an essential and fundamental aspect of teaching (Bullough 2011; Johnson 2008). In addition, a balanced and well developed moral orientation is necessary for teachers to facilitate the development of their students' moral reasoning and action (Fenstermacher 2001). The fairness and norms factor is defined as valuing and upholding rules and promoting equality and fairness, in a thoughtful and caring manner.

Cultural sensitivity

The diversity of backgrounds students bring to school today is broad (Molt et al. 2010). Therefore, a teacher's general sensitivity to culture is important and training to understand hidden biases or false expectations and misperceptions towards their students (Reiter and Davis 2011) should happen in pre-service teacher education (Castro 2010). Teachers are expected to be culturally responsible in expression of their beliefs and attitudes and conduct themselves in a positive, pro-social manner both within their classrooms and schools (Harrington and Hathaway 1995). Student teachers need also to understand the effect of discrimination on school achievement and the necessity for cultural sensitivity to counter such problems (Hachfeld et al. 2011). The two factors defining cultural sensitivity are multicultural awareness and acceptance of difference. Multicultural awareness is defined as sensitivity to, and respect for the range of backgrounds and cultural contexts, beliefs and behaviours students bring. A culturally aware teacher recognizes that individuals come from a range of backgrounds and cultural contexts that foster different perspectives and beliefs (Hachfeld et al. 2011). Acceptance of difference is defined as acceptance of diversity in the areas of culture, political beliefs, socioeconomic status, religion, gender, disability and sexual orientation. Difference in this context should be considered value-free to enable positive social acceptance and attitudes (Gorski et al. 2013; Hachfeld et al. 2011; Molt et al. 2010). It is important for student teachers to respect the authority of the teaching institution to help them to reflect on

their biases, beliefs and to prompt self-insight while in teacher education so as to be of optimal assistance to the students they will ultimately teach (Gorski et al. 2013).

Self-awareness

The final questionnaire associated specifically with the self and is related procedure to determine if respondents are overstating the positive in responses. It is a validity check similar to a standard lie scale and assesses whether candidates are providing overly positive responses (Hahn 2005). Self-awareness is defined as the candidate responding in a desirable manner rather than providing an accurate reflection of their own qualities.

Structured behavioural interviewing stage

It may not be feasible to proceed to interviews. If possible, the decision to offer interviews may be based on the rank made on the basis of averaged scores of the factors above. Ideally, face-to-face contact does bring some possibility to clarify, confirm and check on the accuracy and validity of the scores.

The final phase of the assessment follows a modified selection centre approach incorporating aspects of behavioural interviewing (Oliphant et al. 2008). The structured behavioural interview component provides an optional opportunity to assess candidates' presentation, communication and articulated future professional success. The additional predictability from interviews is very low unless trained interviewers strictly adhere to structured and formal interviewing procedures with clear assessment criteria using questions based on behavioural anchors (Macan 2009; McDaniel et al. 1994; Rettew et al. 2009; Roulin and Bangerter 2012). These techniques have been shown to have utility in some selection, psychiatric and psychological settings but have not yet been widely adopted in educational settings (Rettew et al. 2009; Roulin and Bangerter 2012).

Behavioural structured interviewing is a type of interview that uses past behaviour to understand likely future performance. Candidates are asked to describe their experiences and relate them to how they will perform in social contexts similar to teaching. This form of questioning is known to assess occupational knowledge, experience and judgement and is effective at predicting job performance (Hollman et al. 2008). The interview used here is structured which increases the quality of assessment of likely success as a teacher (Judge et al. 1999). Behavioural structured interviewing is a disciplined approach designed to guard against the tendency to select in a biased manner when interviewing (Metzger and Wu 2008).

The interview is face-to-face and candidates are rated on their responses to structured interview questions on a range of behavioural indicators related to interpersonal skills and behaviour under pressure involving adolescents and adults. The purpose of this aspect of the assessment is to gain valid data from the candidate in a manner that reflects their own expression and way of thinking within the complexity of their daily experience (Brady 2011; Metzger and Wu 2008; Sunley and Locke 2010).

Final rank and offer stage

The purpose of selection varies as a function of the context, the values of the institution and the methods that the institution considers appropriate (Palmer et al. 2011). Some institutions privilege principles of access and equity and aim to attract students regardless of or including students with low grades. Other institutions apply entry processes that privilege people with broad life experience, placing less weight on previous academic scores. Other institutions need to broaden criteria as the high, mandatory grade score that once separated applicants are now achieved by more students than there are places. There are also faculties who argue that grade score remains the best indicator. Grade scores may be the best single indicator but broader criteria is necessary to ensure a better match to the complexities of the task of teaching and educating teachers. Just as there are multiple methods of explaining entry, so the selection and weighting of components of entry tests can be varied. Some institutions may wish to privilege aspects of achievement over self and ability. Others may wish to rely on a combination of grades, for example, grades from the last full year of study and ability scores.

Making the equation and weighting coefficients in the equation to calculate scores and criteria for entry is also informed by the philosophy of the faculty or school making the selection. Most importantly, as noted by O'Loughlin (2011) selecting a testing battery prompts those involved in all aspects of selection to fully inform themselves of the process and meaning of test scores and profiles. Once the combination and weights of factors is defined a rank and summary of descriptive data can be generated. Information about cohorts would be given to those making offers. The scores could be based on a profiling of students constructed from cluster procedure or regression models to identify specific factors that predict particular outcome factors. As recommended by Bore et al. (2009) multiple cut-off methods may be used in which ranges are identified into which students' scores fall. Similarly, final scores can be used to draw up the students to be interviewed (or made an offer) and a second weighting of candidates with interview ratings may be used if this level of comprehensive scoring is desired. Useful year-to-year data can assist in planning and fine-tuning course offerings and focus on factors that require greater attention.

A major benefit of this approach is the provision of a report to each successful candidate to prompt formative use of the profile by each student. Therefore, such data could be used to assist the student to set individual goals that may have an impact on their scholarly work, their placements and their general preparation for teaching practice (Dinham 2008b; Hattie and Timperley 2007).

Conclusions and considerations

Defining and refining selection procedures focuses tertiary schools of education and candidates on what they expect new students to bring and what they actually bring to the foundation of professional learning. Providing a broad spectrum approach helps staff and students to fine-tune their respective viewpoints and provides

formative information back to the student about their achievement and where to focus their self-directly learn.

Comprehensive testing of education candidates provides a valid and comprehensive method for identifying the skills and competencies of prospective teaching candidates. It is broad spectrum and yet efficient as participating universities select the tests they consider most relevant. The process draws attention of staff to articulate what they consider important in selection and the type of candidate they seek. It is a comprehensive method based on valid constructs commonly applied in selection to university internationally, and selection generally, in comparison with other methods commonly used which are not as well founded in research.

The model described here is not prescriptive or finite. Our major long term interest is to develop evidence-informed best practice thus we started with a wide base that will most probably shrink as evidence grows. We hope that the various justifications and reasons for selecting students will be accompanied, in future, with strong arguments justifying more than simply selection on the basis of a single, simple criterion. Further, that correspondingly each selection method will complement the course and the course can be adjusted to meet the needs of each cohort and their designed destination. It is also anticipated that as research grows in this area theories explaining the link from entry to education to career will grow.

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Terry Bowles is a Senior Lecturer in educational and Developmental Psychology at the University of Melbourne. Previously he has taught in primary and secondary schools as a teacher and psychologist. He currently works in the postgraduate Educational and Developmental Psychology program at the Melbourne Graduate School of Education preparing psychology graduates and supervising PhD projects. He lectures in psychological testing, research and practice issues. He has written and presented widely on psychological factors associated with motivation, achievement, change, personality and social and emotional learning. He is responsible for the TeacherSelector research project and test development.

John Hattie is Director of the Melbourne Educational Research Institute at the University of Melbourne. His areas of interest are models of measurement and their applications in educational settings, and related to learning, teaching and leadership. His previous appointments range from Auckland, North Carolina, Western Australia, to New England. He was chief moderator of the NZ Performance Based Research Fund, President of the International Test Commission, Associate Editor of the British Journal of Educational Psychology. He has published and presented over 550 papers, and supervised 180 these students.

Stephen Dinham is Chair of Teacher Education and Director of Learning and Teaching at the University of Melbourne. He is a former secondary teacher and since entering universities has conducted a wide range of research projects in the areas of educational leadership and change, effective pedagogy/quality teaching, student achievement, postgraduate supervision, professional teaching standards, teachers’ professional development, middle-level leaders in schools, and teacher satisfaction, motivation and health. He has a publication record (more than 300 publications) of books, book chapters, refereed journal articles, and articles in professional journals. He is a frequent presenter at international, national and state conferences (over 470 presentations) and has conducted consultancies with a wide range of educational bodies nationally and internationally. He is national president of the Australian College of Educators and a member of the Council of the Victorian Institute of Teaching.

Janet Scull is an Associate Professor, Language acquisition and literacy, at Monash University. She is an experienced language and literacy educator and, as a key author of the Victorian Early Years Literacy Program, has contributed to the design of systemic approaches to literacy teaching and learning. Janet's research to date has explored language and literacy acquisition processes alongside literacy assessment and teaching in the early years. She is particularly interested in exploring relationships between language, literacy and learning. Janet is currently working on a number of research projects that include a focus on writing in the early years, bilingualism and biliteracy, teaching to support Indigenous students' literacy learning and teacher selection.

Janet Clinton is the Director of the Centre for Program Evaluation at the University of Melbourne. She is a psychologist and educator with an extensive publication record and is currently the co-editor of the *Evaluation Journal of Australasia*. Her evaluation experience extends across national and international contexts includes over 150 different evaluation projects. Associate Professor Clinton currently teaches several postgraduate papers in evaluation, and supervises a number of PhD students. Her primary areas of interest and expertise in the area of evaluation include the use of standard setting as a methodological tool, subsequently; developing useable standards for a variety of sectors has been a focus of much of her research. She also has considerable experience in evaluation capacity building.