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Quality Evidence Gathering
Instruments for Schools

Editorial

The Need for Quality Evidence

How can schools choose the genuine ideas offering long-term improvement from the surfeit of superficial and short-term? Or, as Mulford and Silins (2003, p.176) put it, how do schools “sort the wheat from the chaff”? We believe a robust evidence base is needed; an evidence base whose value will depend crucially on the quality of the evidence itself and the ability of those in schools and their communities to effectively use it. Evidence and its wise use are increasingly important in today’s schools.

Quality evidence has a number of characteristics. These characteristics include integrity, clearly defined variables and, most importantly of all, predictive validity. Integrity may mean that the evidence is complex enough to come closer to the reality faced by schools than much of previous material in the area, which may have been gathered from other than school principals (who tend to overestimate the effectiveness of reforms when compared with their teachers – McCall et al., 2001; Mulford et al., 2000; Mulford et al., 2001) and has been collected by other than those involved in the design or implementation of whatever is being implemented. Predictive validity means linking the evidence gathered in schools with student outcomes – something that is a rare event indeed in the research literature on educational leadership and school management.

Where do those in schools start sorting the wheat from the chaff, and gather evidence that enables them to sort the genuine growth potentials offering long-term improvement from the many currently offered elixirs, many of which offer nothing more than short-term opportunism? The current and growing emphasis on evidence-informed policy and practice is as good a place as any (for example, see the UK’s Evidence for Policy and Practice Information and Co-ordinating Centre - EPPI-Centre, 2001).

Evidence-informed Policy and Practice: Used in Schools?

There are conflicting views on whether schools use a process of evidence-informed enquiry, or use it well. In U.S.A., Feldman and Tung (2001) suggest few schools use a process of data-based inquiry and decision-making, and, where it does occur, schools are more likely to develop a professional culture and have improved student achievement. Mulford et al. (2001) have shown in Australia that schools collect evidence that is never used. Glossy accountability evaluation documents lay unopened and gathering dust in school filing cabinets because the evidence on which they were based was unimportant, less than honest and/or too complex. As
Mulford et al. (2001) point out, care is needed in this situation not to fall foul to the old computing adage ‘garbage in, garbage out’.

On the other hand, Earley et al. (2002, p. 9) found that, in England, “Over half the schools surveyed are carrying out their own research and enquiries to inform policy and practice, and … School leaders are beginning to make better use of the wealth of comparative data they receive through government sources.” Klein’s (2003) research on the decision making of successful and unsuccessful Israeli school principals takes Earley et al.’s work a step further. Success was based on the evaluation of two supervisors using criteria established by the Ministry of Education covering 24 aspects of the principal’s work, including teaching and administration functions, public relations and personal traits and skills. Klein found that while successful principals used data gathered from objective sources for the first two decision-making stages of defining the problem and formulating alternatives and personal sources for the final stage of reaching a conclusion, unsuccessful principals used data gathered from personal sources throughout.

In one respect, Earley et al.’s (2002) finding can be a double-edged sword in that comparative data from government sources does not always guarantee quality evidence. To take the Tasmanian education system as an example, the government through its Department of Education took over a process commenced by a group of principals in 1996 called Assisted School Self Review (ASSR), revised it and its subsequent School Improvement Review (SIR), and increasingly insisted on the use of mandated data gathering instruments (Bennett, 2002). The instruments were to be used by schools whether or not they met local contexts, circumstances or needs and priorities. These mandated instruments had all been developed in other state Departments of Education and, in the case of SIR, from a private interstate consultant. The instruments provided the Department with both an ‘instant’, off-the-shelf solution to their (not the school’s) data gathering needs and an ability to be able to compare schools. In fact, despite the attractive, multi-coloured graphs and other feedback provided to schools, the material is very selectively used, if used at all in schools. Ongoing analysis of data from the School Governance and Educational Outcomes project (Mulford, 2004) shows that ASSR and SIR were seen by secondary school principals as having ‘moderate’ to ‘no’ effect on teaching, student learning, or the professional authority of teachers or principals. Surprisingly, data gathering instruments developed in the state by the Department’s own educational leaders, taking account of local contexts and with predictive validity concerns addressed, were, and continue to be, ignored (Ewington’s (1996) work on parents’ perceptions of school effectiveness is a case in point).

Despite these differences and concerns, I agree with Askew (2000) that it is time that understandings about evidence, its quality and use in schools and school systems were examined more closely. Of particular importance is the development of useful data gathering instruments. There seems to be little such material readily available, although there are notable exceptions – one being the web site of the U.S.A. based Character Education Partnership (www.character.org) where an Assessment Instrument Index catalogues a number of survey instruments and a reference list of selected literature for each topic. Topics include academic attitudes, civic attitudes, classroom/school climate, empathy, locus of control, self-esteem, social responsibility, social skills, and trust.
Quality Evidence Gathering Instruments for Schools

Those academics and Departmental officers represented in this edition of *Leading & Managing* have been part of a movement to encourage use of quality evidence gathering instruments in schools and the reporting of the findings in the academic and professional literature. These people should be applauded, for it is only in this way that we can have an open, professional debate over evidence rather than, as seems to be the current norm, seeing it locked away in employers’ files and being selectively used for accountability and control purposes (Mulford, 2005), if used at all, rather than to improve schools and the children in them. It is also the only way to nip in the bud the growing use by schools of commercially available instruments accessed only by those willing to pay exorbitant amounts of money for the ‘privilege’. The lack of validity and reliability of many of these instruments as well as the spending of scarce resources by those in schools to line the pockets of the entrepreneurs who have jumped on this bandwagon is reprehensible. This situation is especially reprehensible where those entrepreneurs have had the privilege of developing their surveys as members of publicly funded universities and/or research schemes.

The articles in this edition of *Leading & Managing* start at the school district level and then move to the school and teacher level before concluding with a number of articles focusing on student outcomes. In the first article, Leithwood describes the origins, conceptual foundations and contents of an evidence-based monitoring system developed in school districts in British Columbia in Canada. Indicators and illustrative measures for school planning and a number of key lessons which emerged from using the system are detailed. The lessons include the need to: educate participants about the monitoring system; choose credible participants; provide tangible and symbolic support for the process; ensure coherence between school and district priorities and the focus of monitoring; and, repeating the process.

In the second article, Mawhinney, Haas and Wood report on research conducted by a school district in Maryland in U.S.A. to develop effective strategies for supporting the development of professional learning communities (PLC) that took into account existing collective efficacy beliefs (CE) of the district’s teachers as they addressed the requirements of implementing *No Child Left Behind*. Teachers’ perceptions of their PLC readiness were found to be related to their CE and CE was found to predict student achievement. Interactive effects were also found with those teachers who were female, with higher qualifications and in primary and higher SES and minority status schools doing better. Few differences were found on the basis of teaching experience or time in the same school. The authors conclude that in order to create the conditions to support the development of school based professional learning communities schools and districts must transform the context in which individuals experience organisational structure and culture.

Moving to the school level, the third article, by Silins and Mulford, outlines the steps taken to construct a questionnaire investigating the nature of organisational learning in the process of identifying the characteristics and processes that define a school as a learning organisation. Validity, reliability and generalisability were found for a survey with the four factors trusting and collaborative climate, shared and monitored mission, taking initiatives and risks, and ongoing, relevant professional development.

The fourth article by Mulford, Kendall and Kendall provides details on the Decision-Making Index (DMI), a nine item survey instrument for gathering quality evidence about
school practices. The DMI is shown to be a useful instrument because it has predictive validity as well as being quick and easy to use. Previous research using the DMI has shown that it is related to student perceptions about their school and teachers as well as perceptions about relationships and their own performance. The results of research in Primary schools in Tasmania reported in this article also show that the DMI predicts the level of involvement in decision-making, the level of control exercised by teachers, positive attitudes to Local School Management, increased professional authority, positive relationships in the school, less stress, effective leadership, the school as a learning community, and high morale.

The fifth article by Ladwig discusses the need for and use of instruments for examining the quality of pedagogy from the perspective of school leaders. It uses the instruments development with the New South Wales Department of Education and Training to support the NSW model of pedagogy, known as the NSW Quality Teaching (QT). The need for an explicit model of pedagogy is discussed and the strategic choices in model development are outlined, including reference to student outcomes, maximising the challenge to current practice, balancing maximum challenge and maximum realism, detailing the level and form of the data gathered (such as language employed and use of quantification), and the fit within already existing information. A brief overview of the model and instruments is followed by advice on both conducting a pedagogy audit and moving from an audit to improving pedagogy. Issues identified include the sensitive nature of direct observation of teaching, the link to accountability and the tension between recognising variance and finding value in a common language about teaching.

At the student level, the sixth article by Hogan and Donovan tackles the hiatus between the breadth of aspiration for schools and the thinness of the measures of school outcomes. It reports on a research project in part to develop measures of non-cognitive skills and the broader social outcomes of schooling. In particular, they report on ‘subjective agency’ both as an outcome variable and a predictor variable for other important outcome measures. Subjective agency consisted of scales of Year 8 and 10 students’ locus of control, voice, persistence, problem solving, self confidence, and coping. Female students, those with parents with higher educational and occupational attainment, those in non-government schools, and those with higher self reported grades were found to have significantly higher subjective agency scores. As well, there were strong relationships between subjective agency and a range of outcome measures. These outcome measures included academic performance, future goal orientation, avoiding risk behaviours such as drugs and alcohol, not being depressed or anxious, existential orientation such as having a sense of achievement and making one’s own choices, self esteem, physical wellbeing, participation in community, and normative identity such as being a good student, son or daughter and citizen. In most instances correlations between subjective agency and other social outcomes were found to be stronger than between academic performance and the outcome measures. This research demonstrates that it is possible to measure student outcomes beyond academic performance. It also suggests that assessment regimes relying exclusively on academic performance fail to adequately measure the broader contribution that individuals are likely to make to their own and society’s wellbeing.

The seventh article by Beatty and Brew continues this theme by detailing the development of an instrument for use in secondary schools to measure student sense of connectedness with school. The instrument is based on relevant dimensions in the literature regarding students’ experiences of teachers, school leaders, social trust and confidence in the
school as these factors correlate with academic engagement. Factor analytic procedures yielded five factors: teacher support, sense of belonging, academic engagement, confidence in congruity between self and school (confidence in school), and trust in school leaders (principal and assistant principal). Interrelationships among these factors suggested that the impact of teacher support and confidence in school on academic engagement is influenced by student trust in leaders. The model points to the need for greater appreciation of how teacher support and trust in leaders (indirectly) can affect student sense of belonging, especially given pressures for performativity upon teachers associated with the increasing emphasis on statewide testing.

The final article is from practitioners in ‘the field’ coming as it does from the Vocational Education in Schools Directorate of the NSW Department of Education and Training. Bell, Smith and Bright report on their experiences in developing a large-scale on-line instrument to measure student self-efficacy to enhance school to work processes. The instrument aims to encourage individual students to think more constructively about their career planning as well as providing regions and schools with a self-efficacy tool that can, along with other tools, inform future strategic planning, and local initiatives. Preliminary analysis indicates a robust instrument that proved helpful to students, career advisers and principals. It helped increase student career awareness, supported student career development and self-management, supported career advisers, contributed to discussions at regional industry and community forums, and provided data to monitor direction and achievement for school and regional planning. Possible applications of the survey within schools and regions are discussed.

**Conclusion**

In seeking to provide information about useful, valid, reliable, and short, easily administered evidence gathering instruments for use by those in our nation’s schools, the authors of the articles in this edition of *Leading & Managing* have achieved a number of things. They have shown that:

1. Intellectual/conceptual foundations, theories of action and maps/models developed are a crucial part of the exercise. Elements in these models have included (the underlined elements represent those that have quality surveys available for use by those in schools detailed in this edition):
   - social trends;
   - local school management;
   - school level (primary/secondary), SES, ethnicity;
   - teacher experience, qualifications, gender;
   - teacher collective efficacy, control, stress, relationships, morale;
   - teacher pedagogy;
   - organisational learning, effectiveness, restructuring, planning, decision-making, leadership;
   - professional learning community, autonomy;
   - student gender, SES, school sector;
• student outcomes – standardised achievement test in reading and mathematics, self-report academic outcomes, subjective agency (locus of control, voice, persistence, problem solving, self confidence, and coping), future goal orientation, avoiding risk behaviours such as drugs and alcohol, not being depressed or anxious, existential orientation such as having a sense of achievement and making one’s own choices, self esteem, physical wellbeing, participation in community, normative identity such as being a good student, son or daughter and citizen, sense of connectedness with school (teacher support, sense of belonging, academic engagement, confidence in congruity between self and school or confidence in the school, and trust in school, and school to work self-efficacy (self-confidence and career planning, decision-making and barriers.

2. The current hiatus between the breadth of aspiration for schools and the thinness of the measures of school outcomes can be addressed, especially by detailing quality measures of student attitudes and behaviour, such as subjective agency, sense of connectedness with school and self-efficacy.

3. A number of the elements involved are not only interrelated but also are developmental, such as where a professional learning community is shown to lead to collective teacher efficacy which, in turn, leads to improved student achievement.

4. On-line versions of the instruments are a viable option for ease of use.

5. Developing quality evidence gathering instruments for schools is a long, challenging, arduous exercise, but that the outcomes can be impressive.

It is time that understandings about evidence, its quality and use in schools and school systems was examined more closely. Those represented in this edition of Leading & Managing have 'started the ball rolling’. They have provided a range of quality data gathering instruments that have integrity, clearly defined variables and, most importantly of all, predictive validity. The predictive validity of the instruments is closely linked to a wide range of improved student outcomes. Why not keep the momentum going by joining us in future editions and publicly sharing your work on quality evidence gathering instruments for improvement in all our schools?

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References


Measuring Student Self-efficacy to Enhance School to Work Processes: The development of a large-scale online survey instrument

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ABSTRACT: The School to Work Student Survey (SWSS) was developed by the Vocational Education in Schools Directorate in the NSW Department of Education and Training (DET) as an on-line survey to provide students with an opportunity to measure their sense of self-efficacy with respect to the intended outcomes of the NSW School to Work Program. It aims to encourage individual students to think more constructively about their career planning as well as providing regions and schools with a self-efficacy tool that can, along with other tools, inform future strategic planning, and local initiatives. In 2003 the Student Survey was completed by 8,877 Year 9 and Year 11 students in the former Lake Macquarie, Newcastle, Maitland and Taree districts. The 2004 pilot involved 108 schools and 18,302 students in Years 9 and 11. These students were located in the Hunter/Central Coast Region and the South Western Sydney Region. Preliminary analysis indicates a robust instrument that proved helpful to students, career advisers and principals. Possible applications of the survey are discussed.
Background

This article sets out the development and preliminary results of a large-scale project to survey levels of student self-efficacy in relation to the School to Work Program. It briefly reviews the literature on the role of self-efficacy in relation to career decision making and then goes on to describe the development of the survey in the context of the NSW School to Work Program. Finally, it reports on the psychometric properties of the survey, and the potential application of the survey as a valuable source of information for school leaders, careers advisers, school counsellors and students.

Literature on Self-Efficacy in Student Career Decision-making

Self-efficacy is a concept derived from Albert Bandura’s theory (e.g. Bandura 1997). It is succinctly (2004, p. 340) in the following terms “The concept of self-efficacy refers to one’s beliefs in one’s capabilities to successfully engage (sic) in a specific area of behaviour”. The notion of self-efficacy has been repeatedly demonstrated to be strongly related to career choices in empirical research spanning the last 20 years (e.g. Betz, 2000). In a recent review of career literature, Chen (2003) observed that self-efficacy is a very widely explored concept in contemporary psychology. Self-efficacy influences goals, intentionality and action in a student’s career development. Self-efficacy beliefs act as mediators between behaviour and changes in behaviour. For example, low self-efficacy expectations regarding a particular behaviour may lead to avoidance of that behaviour, while increases in self-efficacy expectations may lead to an increase in that behaviour.

Bandura (2001) argues that self-efficacy beliefs have an important role in influencing the types of activities (i.e. jobs) and environments in which people choose to participate. Self-efficacy may directly influence the development of career interests (Lent, Brown, and Hackett, 1994). Self-efficacy beliefs along with the expectations of outcomes interact together to influence the development of interests. For instance, students value the outcome of something that they are interested in and that they believe they can perform well. Anderson and Betz (2001) report that self-efficacy leads to exploratory career behaviours. High levels of self-efficacy give people the momentum to direct and manage their behaviour.

Betz and her colleagues were the first researchers to integrate career self-efficacy and career decision-making. Betz and Hackett (1981) initially looked at how career self-efficacy relates to making decisions about career options for university students. They found that efficacy functions as a mediator of career choices and achievements. Career decision-making self-efficacy is significantly associated with vocational interests, selection and persistence in university programs of study, and academic performance (Luzzo et al., 1999). Similarly, Gianakos (1999) reports that career decision-making self-efficacy is related to perceptions of self-esteem and self-efficacy, to the range of occupational options considered, and to commitment and motivation in making career decisions. Low levels of career decision-making self-efficacy will lead to avoidance of career decision-making tasks and behaviours (Luzzo, 1996). Meanwhile high levels of career-decision-making self-efficacy will lead to increased involvement in career decision-making behaviours.
Extending these proposals, Betz and Taylor (2001) advise that career decision-making self-efficacy has a strong relationship with both implied and actual difficulties in making and instigating career decisions. They suggest that measuring levels of career decision-making self-efficacy is suitable for assessing the effectiveness of career interventions.

Measuring levels of self-efficacy should be done in conjunction with measuring the perceived importance of the behaviours in question. Knowing that someone is confident of being able to do something trivial is probably not particularly interesting in most cases. However, knowing how confident a person is of doing something which is important is likely to provide valuable insights into the student population and their career development needs.

**School to Work Program**

The *School to Work Program* was initiated by the NSW Government, initially for 1999 – 2003. Over this period and beyond to 2007, the Government has committed a total of $42M to support the implementation of the Program to assist students in NSW government secondary and central schools to better plan and manage their transition to a range of post-school education, training and employment destinations. Students are supported to develop individual school to work plans through a range of innovative strategies. In 1999, 78 government schools across NSW were involved in the initial pilot of the school to work planning initiative. Students participating in the pilot were identified as ‘at risk’. The reported benefits of the pilot program, especially in enhancing the self-esteem of ‘at risk’ students, was instrumental in expanding the program to include all students in Years 9 – 12 in secondary and central schools across NSW. In 2004, a total of 547 NSW government secondary schools, central schools and schools for specific purposes across 10 regions received funding. These schools were asked to report on their progress by completing a *School to Work Planning Initiative Progress Report*. Overall, schools reported positively on the implementation of the school to work planning initiative. Recommendations from the *Progress Reports* enabled the development and implementation of innovative strategies reflecting current developments in curriculum and pedagogy.

**Potential to enhance Leadership and Management**

As well as providing students with an opportunity to measure their sense of self-efficacy with respect to the intended outcomes of the School to Work Program the survey aims to provide regions and schools with a self-efficacy tool that can, along with other tools, inform future strategic planning, and local initiatives. The resulting Student Survey data has provided information to support the following:

- evaluation by schools of their own School to Work Program initiatives
- evaluation by schools of their curriculum offering and delivery
- regional planning to support schools
- the potential for state and national reporting for the future
Development of the Survey

The *School to Work Student Survey: Planning for my life after school*, now known as the *Future Pathways: Student Survey*, originated in 2002 as an opportunity for students to report on their self-efficacy with respect to the intended outcomes of the *School to Work Program*. It was developed to provide actual student outcomes data to school leaders and teachers. The then Student Assessment and School Accountability Directorate (SASA) supported the development of the Student Survey in consultation with the Vocational Education in Schools Directorate (VEiS) and a Reference Group which included school and district leaders and managers and teachers from the Lake Macquarie District.

The resulting Student Survey was administered in the Lake Macquarie, Newcastle, Maitland and Taree school districts in Term 4, 2003. This pilot trialled both a paper-based and on-line version of the survey. A support manual was provided to schools to ensure a consistent approach to the implementation of the survey.

A total of 8,877 students responded to the survey: 6,851 responses were paper-based and 2,026 responses were submitted on-line. A total of 8,745 valid responses were received from students and used to compile regional survey results.

The Student Survey included questions directed at the following areas: Employment-related skills; Student confidence levels; Goal setting; Part-time work; Job choice; Career information and support; Pathway options; Transition planning; and intended school exit destination/timing.

In addition to its use as a planning and evaluation tool by school leaders, the Student Survey was designed to support one-on-one counselling between the careers adviser and a student. It was used by students to reflect on their thinking at the time of the survey, and to encourage dialogue between the student and their careers adviser in an effort to articulate a career and transition plan.

The Student Survey was also able to assist in:

- school curriculum planning and resource management in relation to the *School to Work Program* for whole year cohorts and equity groups;
- addressing and implementing the Board of Studies cross-curriculum content statements relating to “work, employment and enterprise”;
- providing evidence of the success of implementing vocational/enterprise learning across the curriculum;
- verifying individual student computing skills in line with the current core computing skills assessment (web-based survey only); and
- the ability to collect longitudinal data.

Implications for Managers and Leaders

More specifically, the Student Survey was able to assist school leaders to plan and manage processes which:

- support individual students with their career and transition planning;
- identify students’ employment related skills acquisition;
Measuring Student Self-efficacy to Enhance School to Work Processes

- improve the planning of vocational learning activities for student cohorts and equity groups;
- enhance the development and use of career resources;
- provide information that can be reported in the annual school report.

Outcomes identified during feedback:

- increased student career awareness;
- support student career development and self-management;
- support careers advisers individual consultation with students;
- contribute to discussion at regional industry and community forums;
- provide data to monitor direction and achievement for school and regional planning.

The reports generated were an individual student report, school report, district report and a regional report for each of the year groups. Other regional reports generated from the data were Aboriginal Torres Strait Islander (ATSI) and Language Background Other Than English (LBOTE) reports in each age group.

Reports were also generated from both the paper-based and the on-line surveys. Students’ paper-based responses were entered on-line by DET staff to enable the data to be aggregated. The four reports generated from the survey are outlined below.

Individual student reports
Each school received their students’ reports in both hard copy and on CD-ROM. This was done to comply with privacy provisions. The CD-ROM included a template so that schools could generate individual student reports. The CD-ROM provides students with the facility to amend their survey entries as a result of further individual career counseling and personal experiences.

School reports
The schools also received their school report on CD-ROM at a seminar held in each district attended by the principal and executive staff and the relevant district office staff. The school report provides a graphical representation of Year 9 cohort and Year 11 cohort responses to the survey. The seminar focused on the contents of the CD-ROM and how this information could be used by school leaders as a feature of their planning and reporting cycle and how this data could add value to school and district evaluation.

District and regional reports
A district report and a regional report were provided to the superintendent of each district. The district and regional reports provide graphical representation of Year 9 cohort and Year 11 cohort responses to the survey. The data is graphically represented for each district as well as for the regional area comprising the four participating school districts.

Regional Aboriginal Torres Strait Islander (ATSI) and Language Background Other Than English (LBOTE) reports
Regional ATSI and LBOTE reports were generated to allow for an analysis of responses to the survey by students in Year 9 and Year 11 who identified themselves as ATSI or students with a
Feedback was sought from school coordinators through a written survey immediately after the implementation of the student survey. Further feedback was gathered at district seminars prior to the distribution of reports. The feedback from the written survey and the district seminars indicated that schools valued the survey and its capacity to support individual student career counseling as well as school, district and regional School to Work Program strategic plans.

The feedback from the pilot indicated the following benefits of the survey:

- increased student career awareness;
- supported student career development and self-management;
- supported careers advisers individual consultation with students;
- contributed to discussion at regional industry and community forums; and
- provided data to monitor direction and achievement for school and regional planning.

The Survey

As a result of the pilots and feedback a number of modifications were made to the survey. It was designed to collect information across a wide range of different career-related issues. However, central to the survey was the measurement of student self-efficacy. Related to this measure are measures of Career Inhibitors – the perception of barriers to a career path such as too low marks, an injury, or a lack of training or experience. In addition the perceptions of the importance of career-related information and the importance of a range of work features and opinions of self and key others about career plans were also included in the survey. Thus the survey was designed to measure four factors: Career Planning, Self Confidence, Career Decision-making and Career Blockers/Barriers.

The following section provides an outline of the survey. The reader is welcome to contact the corresponding author for further details of the survey or permission to use the copyrighted instrument. The survey consisted of 38 questions preceded by some instructions, a privacy notice and a space for the student’s name.

The instructions were as follows:

The following questions are to help you think about life after school: what you might want to do and how best to prepare to reach your goals while at school. When you complete the survey you will be provided with some feedback. You should read this feedback when thinking about your future career planning.

Please, don’t rush the questionnaire. Take the time to think carefully about each question and how you will answer it. Where you don’t know the answer or are unsure, where possible make that your response - it’s these things that are important for us to know in order to help you.

Demographic Data

Questions 32 to 38 consisted of a series of standard demographic items. These covered (in the order presented): gender; academic year the student is currently in; Aboriginal/ Torres Straight
Islander status; other languages spoken at home; Medical and disability history.

Goal Setting Self Efficacy
Questions 1 – 4 inquired about vocational goals and confidence (self-efficacy) in setting them. A goal can be defined as the determination to engage in an identified activity with the aim of causing a specific outcome (Bandura, 1986). Lent, Brown and Hackett (1994) argue that goals help people organise and guide their behaviour, maintain it over time and increase the likelihood that desired outcomes will be attained. Within a social-cognitive approach to career development, goals are predicted to influence self-efficacy which in turn may affect the subsequent goals one selects and pursues. Goal setting has been associated with a variety of positive vocational outcomes and is commonly used in vocational counselling (e.g. Bright, 2003; Pryor & Bright, 2005, Bright and Pryor, 2005; Pryor and Bright in press). A sample statement from this section was:

1. I can set goals for my future

Career Decidedness
Questions 5 – 8 explored Career Decidedness and provided questions related to part-time work. Chartrand et al. (1994) argue that career indecision is a developmental problem within the career maturation process relating to a lack of information about self or the world of work. Measures of career decision status attempt to clarify certainty or indecision (Career Decision Scale; Osipow et al., 1987) or comfort and decidedness (Career Decision Profile: Jones 1989; 1999) pertaining to career decision-making. The Career Decision Profile (Jones, 1989) describes not just the status of the decisions that are made but the reasons underlying these pertaining to knowledge about self (i.e. self-clarity), knowledge about the world of work (i.e. knowledge about occupations and training), the ability to make decisions generally (i.e. decisiveness) and the salience of the career decision (i.e. career choice importance). Earl and Bright (2003, 2004) found that career decision status was more related to age and volume of experience rather than any specific types of work experience. A sample question from this section was:

7. Have you thought about the kind of job you want as a career? (Select one option)
   Yes / No

Career Influences
Questions 9 – 16 focussed on career influences, and their importance. Questions 9 – 12 were only for those respondents who indicated that they had thought about the kind of job they wanted for a career. The questions surveyed sources of influence in students’ thinking about jobs. There is increasingly a large body of literature pointing to the complexity of influences on career choices. For instance Bright, Pryor, Wilkenfeld and Earl (2005) found that four factors - the media, teachers and careers advisers, family and friends, and unplanned events - accounted for 37.17% of the variance in a sample of 651 Australian university students. Similarly a range of other writers (e.g. Collins, 1990; Leong, 1996; Sears, 1982; Vondracek, Lerner, & Schulenberg, 1986), point to the range and complexity of the influences of human career decision-making and development, and the need to consider a much broader range of variables across various disciplines. A sample statement from this section was:
12. List the people, places or things where you can get help to work out what your future job(s) might be. (Please type your answer below)

**Career Inhibitors**

Barriers to careers and self-limited thinking in general serve to undermine self-efficacy and so inhibit career exploration and ultimately career success. Barriers to careers were measured in question 17. Barriers to career plans are reported regularly by high school students and can include a range of issues such as geography, failure to get the marks, illness or injury and change of residence (see Bright et al., 2005).

**Self Efficacy**

Self-efficacy was specifically measured with questions 18 – 26. Self-efficacy was measured across a range of behaviours, these were: job changing; procuring additional education or training; job exploration; vocational information; and vocational planning. A sample question from this section was:

How confident are you in being able to do the following?
(Select one option for each question) I don’t know/ Not confident/ Very confident

18. I can change my job choice, if necessary, as time goes on.

**Career Planning**

Questions 27 – 31 related to career planning. The items covered the relative importance of a range of factors including finances, training, skills, opinions of key others. A sample question from this section was:

28. How likely are you to leave school? (Select one option for each factor):
   I don’t know/ Not likely/ Very likely/ Before the end of Year 10/ At the end of Year 10/ Sometime during Year 11 or 12/ After completing Year 12/ If you were offered a job/ If you were offered an apprenticeship or traineeship.

**Reports from the Survey**

Reports generated were an individual student report, school report, district report and a regional report for each of the year groups. The primary purpose of the survey was to assist in the career counselling process, however the school and regional level reports also had the potential to inform planning considerations.

**Student Report**

The student report was written in a manner to encourage increased self-efficacy in relation to Career Goal Setting/Self Management. Each student received a 3-page written report that contained feedback arranged around four key themes: Career goal setting, Career decision-making, Career Action Planning and Career Self – Management. Table 1 shows the items described by each of these themes and the scoring method adopted.
TABLE 1: SCORING OF THE INDIVIDUAL STUDENT FEEDBACK REPORT

<table>
<thead>
<tr>
<th>Category</th>
<th>Questions Numbers</th>
<th>Questions needing Individual responses</th>
<th>Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Career goal setting</td>
<td>1, 2, 3, 4</td>
<td></td>
<td>4 – 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10 - 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11 - 12</td>
</tr>
<tr>
<td>Career decision-making</td>
<td>7, 11, 14, 16, 17, 29, 30, 31</td>
<td>15, 18, 32a</td>
<td>6 – 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11 - 15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>16 - 21</td>
</tr>
<tr>
<td>Career Action Planning</td>
<td>25, 26, 27</td>
<td>28, 32, 32b</td>
<td>1 – 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7 - 8</td>
</tr>
<tr>
<td>Career Self-Management</td>
<td>19, 20, 21, 22, 23, 24</td>
<td></td>
<td>6 – 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>14 - 9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15 - 18</td>
</tr>
</tbody>
</table>

Questions – 5, 6, 9, 10, 12 and 13 were all questions for the student and careers advisers to reflect on and not for scoring or immediate reporting purposes. Questions 15, 18, 32a, 28, 32, and 32b were left for advisors to respond to the particular answers given by each student.

The student report contained feedback clustered into these themes based on their responses to the questions. Feedback was in the form of words and there was no reference to categories such as low, medium or high. Generalised feedback around each of these areas was developed for the students to encourage career self-efficacy, planning and exploration. The feedback was explicitly designed to link into The Australian National Career Information System, myfuture website, at www.myfuture.edu.au, and consisted of a series of action recommendations. An example of the general feedback given to students regarding career goal setting is set out below:

*The best time to start thinking about your future is now. You will feel more confident when you take charge of what you want to do and set some goals to get there. The following suggestions should help you get started:*

- Identify your interests and what you are good at by doing the following:
- Make a list of your favourite activities
- Complete the job research activity in section 1 of the Job Guide
- Go to www.myfuture.edu.au and complete the activities in the My Guide section
- Talk to your friends, family and teachers
- Try working in some jobs that interest you eg part-time work, work experience / work placement, volunteer work
- Make an appointment to talk to someone you know in a job field that interests you and ask lots of questions (remember – prepare before you go!)
- Reflect on the skills you have recorded in your Employment Related Skills Logbook
- Make an appointment to see your careers adviser.
Reports to Schools and Regions

The reports to schools and regions contained summary data broken down by year group and gender for each school or region. Responses to each question were presented in both graphical and tabular form. Figure 1 illustrates a typical presentation of data extracted for question 29 of the survey.

FIGURE 1

When do you currently plan to leave school?

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I don’t know/undecided</td>
<td>8</td>
<td>9</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>17.39%</td>
<td>19.57%</td>
<td>18.48%</td>
</tr>
<tr>
<td>Before the end of Year 10</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>At the end of Year 10</td>
<td>13</td>
<td>8</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>28.26%</td>
<td>17.39%</td>
<td>22.83%</td>
</tr>
<tr>
<td>Sometime during Years 11 or 12</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>10.87%</td>
<td>0.00%</td>
<td>5.43%</td>
</tr>
<tr>
<td>After completing Year 12</td>
<td>20</td>
<td>28</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>43.48%</td>
<td>60.87%</td>
<td>52.17%</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>0.00%</td>
<td>2.17%</td>
<td>1.09%</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td>46</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>100.00%</td>
<td>100.00%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

As a result of the psychometric evaluation of the survey, both the student and the group
reports are currently being revised to present the data in a more coherent and digestible form based upon the results of that psychometric evaluation.

**Psychometric Evaluation**

The analyses reported here are based on the latest version of survey which was completed by 18,302 students. Principle components analysis was conducted on items predicted to load on the four factors of Career Planning Information and Influences, Self-Efficacy, Career Decision Making Complexity and Career Inhibitors. In all cases there were no violations of the assumptions required for this procedure, with each factor accounting for large amounts of the variance and having high internal consistency. This was confirmed by conducting a confirmatory factor analysis.

The principle components analysis results are presented in Table 2.

**TABLE 2: PRINCIPLE COMPONENTS ANALYSES AND SCALE RELIABILITIES FOR THE SURVEY**

<table>
<thead>
<tr>
<th>Factor</th>
<th>% Variance Explained</th>
<th>Internal Consistency (Cronbach’s alpha)</th>
<th>Number of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Planning</td>
<td>58.17</td>
<td>0.93</td>
<td>12</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>50.59</td>
<td>0.88</td>
<td>9</td>
</tr>
<tr>
<td>Career Decision-Making</td>
<td>36.85</td>
<td>0.87</td>
<td>14</td>
</tr>
<tr>
<td>Career Inhibitors</td>
<td>52.43</td>
<td>0.90</td>
<td>10</td>
</tr>
</tbody>
</table>

We hypothesised four models – one for each factor, with the questions in each case all loading onto one factor. The confirmatory factor analysis for each of the factors indicated a satisfactorily fitting model on all dimensions. Maximum likelihood estimation was employed to estimate all models. The independence model that tests the hypothesis that all variables are uncorrelated was easily rejectable in all cases (Chi-squareds 395041.94, 142988.64, 214640.87, 236723.13 p<0.01 in all cases). The hypothesised models were tested next and support was found for the hypothesised models in all cases. See Table 3 for details of chi-squares, comparative fit index, and chi square difference test between the independence model and the hypothesised model.

Overall the psychometric analysis points to a robust four factor structure that is coherent in theoretical terms and which provides a sound platform from which more conceptually sophisticated and coherent feedback reports can be generated for use by students, careers advisers, principals and regional managers.
### TABLE 3: MODEL FIT STATISTICS FOR THE 4 FACTORS

<table>
<thead>
<tr>
<th>Factor</th>
<th>Chi Squared</th>
<th>Comparative Fit Index</th>
<th>Chi-square difference test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Planning</td>
<td>48005.82</td>
<td>0.88</td>
<td>57117.28</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>17636.75</td>
<td>0.88</td>
<td>19771.19</td>
</tr>
<tr>
<td>Career Decision-Making</td>
<td>55206.65</td>
<td>0.74</td>
<td>62429.05</td>
</tr>
<tr>
<td>Career Inhibitors</td>
<td>21576.00</td>
<td>0.91</td>
<td>23191.10</td>
</tr>
</tbody>
</table>

### General Evaluation of the Survey

Feedback was sought from those involved in the piloting of the survey at various stages. Feedback was sought from school coordinators through a written survey immediately after the implementation of the student survey. Further feedback was gathered at district seminars prior to the distribution of reports. A range of different stakeholders provided feedback in addition to the schools and these included the following personnel: the Vocational Education in Schools Directorate (VEiS), the Educational Measurement and School Accountability Directorate, Vocational Educational Consultants, principals, Regional Chief Education Officers, and the Information Technology Directorate.

The then Student Assessment and School Accountability Directorate, the Vocational Education in Schools Directorate and a reference group which included school and district representatives from the Lake Macquarie District, careers advisers from four Lake Macquarie District schools refined and tested the early drafts of the survey with small groups of Year 9 students. The survey was tested across whole year cohorts of Year 9 and Year 11 students to allow further feedback to be gathered on the design, administration and usefulness of this survey.

The feedback from the written survey and the local seminars indicated that schools valued the survey and its capacity to support individual student career counselling as well as school, district and regional *School to Work Program* strategic plans.

As the result of feedback, the survey was found to be beneficial because it has the capacity to:

- increase student career awareness;
- support student career development and self-management;
- support careers advisers individual consultation with students;
- contribute to discussion at regional industry and community forums; and
- provide data to monitor direction and achievement for school and regional planning.
Cooperation of Directorates

The Student Survey represents the second largest data capturing exercise engaged in by the NSW DET, after schools testing. The survey is the result of close cooperation and significant work by several separate directorates within DET (Information Technology; Educational Measurement and School Accountability; and Vocational Education in Schools). In addition the development of this survey required the cooperation of two regions, which in turn required close liaison with key stakeholders in these regions and close attention to the feedback from the various stakeholders.

Future Potential Uses within Schools

The survey has been demonstrated to be of value at different levels in the school system going beyond its original purpose as an effective counselling tool. Whilst the primary purpose of the survey is to assist students and careers advisors in developing effective School to Work plans, the survey has the potential to increase the effectiveness of leadership in several ways.

The survey has a strong theoretical basis derived from self-efficacy theories of career development that point clearly to the enhanced vocational education outcomes associated with increasing levels of self-efficacy. Careers advisers now have a tool that will measure these concepts reliably and precisely allowing them to tailor their advice and to develop individual strategies aimed at boosting self-efficacy where necessary.

The summary data provided to principals will assist in their management, planning and support of careers advisers as it provides a clear picture of the range of issues and influences that confront the school careers adviser. Consequently this will enhance the dialogue between careers advisers and principals which should result in more systematic and effective vocational education within schools. Furthermore the survey provides principals with an opportunity to introduce relevant vocational education into a range of other subjects in a more strategic manner. Feedback from principals has also confirmed that the aggregated data can be of considerable value in contributing to a fuller profile of each student in the school.

Recently, the tenets of chaos theory have been successfully applied to career decision making, in the chaos theory of careers (e.g. Pryor and Bright, 2003; Bright and Pryor 2005). The chaos theory of careers illustrates how notions such as complexity of influence, non linearity and unpredictability apply to career behaviour. One of the tenets of this approach is that the complex array of influences on career decision-making makes prediction at the individual level using reductionist measurement techniques problematic, and consequently the practitioner is advised to instead analyse the patterns that emerge from this complexity to understand career behaviour. In the teaching leadership literature, Mulford and Johns (2004, p.72) argue that “successful school leadership emerges as a process of learning of both individuals and whole school communities”. Thus principals need to attend to the “designed” and “emergent” parts of the organisation. The survey provides principals with an emergent data pattern derived from the complex array of influences and processes that characterise career decision making. Thus assisting principals get a picture of the complex social forces impinging upon schools, and vocational behaviour. This also encourages principals as school leaders to engage in broader systems thinking throughout the
school.

School reports
Clearly the survey generates quite detailed information that can be usefully presented and analysed within the school report. This assists principals by providing coherent and reliable data on an activity within the school that has not traditionally received such detailed statistical coverage. This assists the whole school community by raising awareness of vocational education issues.

A way of changing cultures to increase acceptance of I.T. within schools.
A possibly unexpected benefit of the survey in its most recent on-line format is that it encourages a higher level of acceptance of Information Technology within schools. Completion of the survey meets the requirements of the Information and Communications Technologies (ICT) subject for students to have completed an on-line survey. Thus time and resources given to the completion of the survey can be justified directly in pedagogical terms.

In addition the survey provides a tangible example of the benefits of using information technology and how this can be harnessed to non-technology related outcomes.

Future Potential Uses within regions
There are a variety of possible applications for this survey at the regional level. Three immediate and practical applications are outlined.

Vocational training planning
The survey provides data on School leaving intentions and future training requirements that could be usefully integrated into planning for the future provision of vocational training in the area. In addition, data on influences and barriers may have area specific aspects to them that could be usefully identified and addressed at the regional level through resourcing, education programs and other measures.

Enhancing the development of school – industry partnerships
A closer understanding of the needs and expectations of school leavers will assist the School to Work transition in several ways. Firstly students working with their Career Advisers and who have used the survey to inform their sessions, should be better advised, and better prepared for the transition. This should result in regional employers seeing benefits of a better fitting and more informed and motivated workforce.

Furthermore, any general perceived issues, emergent themes or barriers to employment can be identified and dealt with at the regional level through policy initiatives, meetings and other interventions.

Closer linkages between schools and tertiary institutions
Finally, having a clearer understanding of the vocational behaviour and thinking of school leavers could be potentially valuable in transitions to tertiary institutions. Understanding expectations,
barriers and self-efficacy will assist in developing bridging programs, open days, enrolment procedures and a range of other issues at this interface.

Conclusions

This article has described the development and implementation of a large-scale on-line survey designed to measure student’s vocational self-efficacy and to enhance the student-career adviser counselling process. The survey represents a major accomplishment for the NSW Department of Education and Training being the second largest assessment exercise undertaken outside of schools testing.

The results of the survey indicate a psychometrically reliable scale capable of providing accurate information about students’ vocational thinking. In addition through close consultation and cooperation between students, teachers, principals, and a range of state directorates of the Department, the survey was incrementally improved and a range of other applications and benefits of the survey became apparent that extend beyond the student-career adviser interaction into school and regional leadership and management. The survey represents a major step toward providing quality evidence gathering instruments for use in schools in a way that enhances control and self-efficacy for the most important members of that community – the students.

References


Notice for Contributors

The use of two active, present participles in the journal title appears, perhaps, slightly unorthodox, but the choice is deliberate. Leading & Managing (L&M), for us, assumes that while leading and managing are qualitatively different activities, in reality they complement one another, and are vital to the effective performance of complex organisations and groups. We think managing is best thought of as tied to the performance of specific roles and organisational responsibilities. While this may also be true of leading, it is invariably not the case.

Instead of providing just one more scholarly vehicle for concentrating on leadership and management as conventionally understood and statically defined functions we believe L&M highlights two key organisational processes: the acts of leading and managing.

Specifically, we have aimed L&M at personnel working at all organisational levels and in all sectors and systems, principally, but not exclusively, in the sphere of education, with that word understood in its widest sense. We have set two goals for L&M: (1) to advance understanding of what it means to lead and to manage, the experiences of organisational personnel while engaged in leading and managing and the experiences and reflections of those who find themselves being led and managed; and (2) to improve the practice of leading and managing through empirical research and theoretical analysis.

In the belief that no one particular school of thought ever has a monopoly on wisdom or truth, we want L&M to be eclectic in its scope and tolerant of diverse standpoints. Accordingly, we welcome manuscript contributions from a plurality of perspectives. These may report empirical research, best practice and pedagogy, propose intervention and consultancy strategies, or comprise discussions of theory and methodology.

We ask contributors to bear in mind the following broad indicators of quality writing when preparing manuscripts for submission. Above all, we seek significant contributions to L&M which advance understanding of leading and managing. We ask that authors should demonstrate their familiarity with current developments in the field and strive to bring to bear distinctive and new perspectives on their chosen topics. We expect arguments to be tightly structured, clearly presented and written in prose that is accessible to a diverse readership.

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