Principal Expertise and Problem-Solving in Three Independent Girls’ Schools in Victoria, Australia

McKeand

ABSTRACT This study investigates principal expertise and problem-solving processes. Three female Principals of K to Year 12, independent girls’ schools in the Melbourne metropolitan area, Victoria, Australia were studied. Multiple case studies were used to examine the complexities of leadership expertise and problem-solving techniques. Characteristics of Principal expertise and the strategies used in school leadership problem-solving were identified. If an understanding of leadership practices is to occur, it is fundamental to examine the thinking and problem-solving processes of school leaders.

Four characteristics of expertise are examined comprising: a strong commitment to shared goals; cognitive flexibility; the Principal’s contribution to the long-term development of the staff for both professional development and collaborative decision-making; and finally, the Principal’s use of the capacity or talent of the staff to obtain solutions. The Literature Review includes an analysis of expert and non-expert or typical principals as they vary in the processes they adopt to solve problems in group settings. These processes include: organisational learning and systems thinking, collaboration, alignment of staff with a common core of goals, school leader values and the principal’s affect during problem-solving.

Fourteen themes related to Principal expertise and problem-solving emerged from the findings in these three case studies. These relate to comments about expertise and problem-solving, vision, staff alignment with goals, change management, risk-taking, constraints, values, conversation, intuition and creativity, a sound knowledge base, delegation, collaboration and staff empowerment, Principal’s affect and professional development of staff. The emphasis on knowledge, intuition and creativity and various strategies for problem-solving, including strategic intelligence and thinking, and scenario planning have extended the current literature on Principal expertise.

INTRODUCTION

This research studied three Principals of independent girls’ schools in Victoria, using multiple case studies to examine the complexities of leadership expertise and problem-solving techniques. Various characteristics of Principal expertise and the techniques used in school leadership problem-solving were identified.

In the literature review, the significance of the study, expertise and problem-solving are briefly described. The summaries provide the reader with an introduction to the key ideas that have guided the research. Research aims and methodology follow the literature review. The findings of the research are presented in the section on data.
analysis and results. Implications for further research and a conclusion complete the paper.

**Literature Review**

1. **Significance of Study**

As Loader (1997: 102, 103) states, the Principal’s primary commitment is to the big picture and managing change whereas in the past, challenges were about improving on what had been done before. Tasks selected to be accomplished need to be given leverage. The Principal can provide this leverage by establishing funding priorities in a multi-million dollar budget and by changing the culture of the school by staff appointments, the allocation of resources, restructuring, school evaluations and ceremonies (Loader, 1997: 103). An emphasis on the vision and the change process is supported by Heifetz and Laurie (1997) who argue that, “leaders have to be able to view patterns as if they were on a balcony. ... Leaders have to see a context for change or create one.” As education becomes more complex, the Principal is typically confronted with ambiguous circumstances in which a number of events and circumstances are occurring simultaneously, various goals and values of the school may be in conflict and truth may take various forms. Yet, the need for decisions and solutions to issues continues. Appropriate solutions to difficult problems are often scattered and require close collaboration with key people to draw on knowledge and experience to make an informed judgement. Such a frequent and demanding task requires expertise in the form of the thought processes and strategies required to solve problems.

A greater understanding of current Principal expertise and problem-solving strategies is essential since the processes used by today’s experts are of assistance to present and future school leaders. Leithwood and Steinbach (1995: 313) note that despite the importance of Principal expertise, there is a lack of research on this phenomenon. Research on the topic may well contribute to the long-term capacity of schools to solve future problems. Leithwood and Steinbach (1995: 169) expand the need for additional inquiry by stating, “Our conclusion, as a whole, portrays effective administrative problem-solving as a logically messy and decidedly social process.” Both the practical importance of and need to comprehend problem-solving techniques is further reflected in Senge (1990: 217), “Being a visionary leader is not about giving speeches and inspiring the troops. … Being a visionary leader is about solving day-to-day problems with my vision in mind.”

Leithwood & Steinbach (1995: 8) argue that effective Principal leadership can be conceptualised as the exercise of expertise and that this expertise is manifested in the way expert Principals solve problems. This contention guides the research in this study on Principal expertise and problem-solving.
2. Expertise

a.) The Meaning of ‘Expertise’

Expertise occurs when a person has complex skills and knowledge, which are used to achieve endorsed goals (Hallinger, Leithwood & Murphy, 1993: 271; Leithwood & Steinbach, 1995: 13). There is a danger in inferring expertise by merely observing actions and their consequences. Instead, effectiveness occurs when a goal state is attained. Experts then, will sometimes be effective but not always and non-expert leaders will be less often effective than experts. On a competence measure, such as, a normal distribution curve of skill, ‘expertise’ would be restricted to those individuals at the upper end of the distribution of competence (Salthouse, 1991: 286).

Expertise is a complex phenomenon. Leithwood, Begley and Cousins (1994: 78) and Leithwood and Steinbach (1995: 123) describe four characteristics of Principal expertise:

- Strong commitment to shared goals
- Cognitive flexibility
- Contribution to the long-term development of staff
- Use of staff capacity to obtain solutions to problems

b.) Experts and Non-Experts

A study of expertise requires distinguishing between expert and non-expert thinking and behaviour. Leithwood, Jantzi and Steinbach (1999: 100) found that expert Principals when compared to non-experts, excel in their own subject area, perceive meaningful patterns more easily, solve problems in a shorter time and with greater accuracy, and have better short and long-term memories about matters within their own domains. Experts’ outstanding memories are domain specific, that is, they display superior memory only for information related to the content of their subject area. Knowledge bases are hierarchical, densely interconnected and organised which allow new information to become well integrated and this facilitates recall. Similarly, the organisation of experts’ knowledge is evident in their rapid recognition of patterns, which assists both accurate and enhanced recall of organised information and the integration of complex data.

An expert’s knowledge differs from a non-expert’s in that much of it may be proceduralised (Husen & Postlethwaite, 1994: 2196). All expert performance is comprised partly of routine procedures due to the development of proficiency with attention demanding, complex tasks. Certain component skills become automatic. When experts face situations that require variable conditions of performance, they must plan and apply their knowledge in adaptive ways. As such, experts develop a set of critical, self-regulatory or metacognitive skills which assist their performance.
Principal expertise is essential for the current educational climate, which is characterised by constant change and turbulence. Constant change in schools and communities, and the increasing diversity in societies are having a profound impact on schools and leadership practices. In such an environment, Principals often encounter ill-structured or ‘swampy’ problems. (Leithwood et al. 1994: 96)

3. Problem-Solving and Thinking

a.) Definitions

A problem can be conceived as consisting of a given state or current situation, a goal state or desired situation and procedures for moving from one state to another. A problem occurs when a situation is in one state, the problem-solver wants it to be in another state and there are obstacles to a smooth transition from one state to another. Problem-solving occurs when a problem-solver engages in thinking or cognitive activity aimed at overcoming a problem. Usually, some action is devised which may mediate between the existing state and the desired outcome. This entails a mental search for a path between the given state of a problem and its solution. Thus, problem-solving has three major aspects. It is cognitive since useful and original solutions frequently have to be generated by thinking. Problem-solving is also a process since it involves manipulating or performing operations on the problem-solver’s knowledge. Finally, problem-solving is directed because there is an attempt to achieve some goal.

b.) Different Types of Problems

A distinction can be made between well-defined or structured problems and ill-defined or ill-structured problems based on the clarity of the problem statement. A well-defined problem has both a clear given state and goal state together with a clear set of steps to follow to solve the problem. An ill-defined problem has a poorly specified given state, goal state and/or means for the solution of the issue. A second distinction can be made between routine and non-routine or ‘swampy’ problems and is related to the knowledge of the problem-solver. Routine problems are very similar to problems that have been solved before and therefore, merely require reproducing earlier thinking. Strictly speaking, these are no longer problems since they do not include an obstacle between the given and goal states. Non-routine or swampy problems, however, are different from any problems that the problem-solver has solved previously and therefore, require a novel or creative solution which often arises in a group situation.

Well-structured problems, usually those repeatedly encountered by expert leaders, are often solved with little conscious thought. The problem is recognised as an example of a category of problems about which the leader is familiar or knows a great deal. Such recognition enables the leader to access all the knowledge he or she has.
stored in long-term memory about how to solve that type of problem. However, no comparable store of knowledge is available for either ill-structured or swampy problems and so the leader needs to respond in a more deliberate, thoughtful manner. It appears that many of the problems encountered in practice are ambiguous, uncertain and not readily quantifiable and these issues may be comparable to ill-structured problems. As those providing leadership face a greater proportion of ill-structured problems, better understanding of those deliberate, thoughtful processes becomes increasingly important as does enhancing the expertise with which these processes are carried out (Leithwood et al. 1999: 101). This research contributes to knowledge by extending the current literature on Principal expertise and group problem-solving processes.

c.) Processes Used by Expert and Non-Expert or Typical Principals to Solve Problems in Groups

Leithwood et al. (1994: 84, 199) and Leithwood and Steinbach (1995: 103, 142) consider that there are five processes, which differentiate expert from non-expert or typical Principals as they solve problems in groups:
- Implementing organisational learning and systems thinking
- Collaboration
- Encouragement of a common core of goals amongst the staff
- Reliance on certain values
- Affect

C. Research Aims and Methodology

The research aims to explore various dimensions of expertise and problem-solving. The research questions addressed by the study were:

a.) What are the characteristics of leadership expertise that are evident in these Principals?

b.) What are the skills that these Principals use to obtain solutions to problems?

In this research, three qualitative case studies (Merriam, 1988: 44) occurred, in that three Principals were studied at different independent girls’ schools to give insight into their leadership, expertise and the problem-solving strategies that they employ. The inquiry is an exploration of expertise and problem-solving in each of the Principals at these three schools.

The multiple case studies attempt to investigate the thinking of three school leaders involved in educational change and improvement. The Principals are from three
independent girls’ schools in the metropolitan area of Melbourne, Victoria. Similarly, two other additional senior staff at each school were interviewed three times for their perceptions about the Principal’s leadership. These two people at each location are the Deputy Principal and the Curriculum Coordinator. They were chosen for their close working relationship with the Principal and insights into that particular Principal’s leadership. Each participant was interviewed three times for depth and richness of information (except at School One where Participant A only had one interview since she stated that she did not work as closely with the Principal as Participants B and E). There are a total of 27, one hour interviews. The form of the interviews were semi-structured and included a brief interview guide and questions (Burns, 1997: 330). The emphasis then, is on both the Principals’ understanding of their own leadership together with the perception of senior staff of their Principal’s leadership.

D. Data Analysis and Results

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<tr>
<th>SCHOOL ONE</th>
<th>SCHOOL TWO</th>
<th>SCHOOL THREE</th>
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<tr>
<td>Principal – 3 interviews</td>
<td>Principal – 3 interviews</td>
<td>Principal – 3 interviews</td>
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<tr>
<td>Participant A – 1 interview</td>
<td>Participant C – 3 interviews</td>
<td>Participant F – 3 interviews</td>
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<td>Participant B – 3 interviews</td>
<td>Participant D – 3 interviews</td>
<td>Participant G – 3 interviews</td>
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<td>Participant E – 2 interviews</td>
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**Table 1 - Participants Interviewed at Each School**

This section presents the analysis of the 27 taped and transcribed interviews on a thematic basis. “Meaning units” (Tesch, 1990: 116) enable the material to be condensed so that themes can be located. Thematic analysis of each interview was conducted by the researcher without the use of computer software. Manual analysis resulted in fourteen common themes or groupings of similar meaning units. Common themes were defined by the researcher, by carefully reading the text of each interview so that the themes accurately reflected the intent of the speaker. The interpretation, at this stage did not adhere to a theoretical position. Rather, this stage resulted in the production of a set of common themes for each interview. Coding began as soon as the first interview was conducted, as this facilitated recognition of themes and an understanding of information which could be useful for subsequent interviews. For example, the importance of knowledge (a meaning unit), is illustrated by the Principal of School One in Interview 2.

Principal (690): *I think knowledge is very important. You can’t base decisions on sand. You have to have a firm foundation of knowledge and that knowledge would be gained through experience as well as content of reading and information.*

The themes are listed in Table 2 below, the order reflecting the significance of the themes according to the number of people mentioning them. Participant support for the fourteen themes is taken from analysis of the summaries of interviews. The
themes are often related to both research questions. For example, theme number 11, ‘knowledge’ is important as a characteristic of Principal expertise and is viewed by the three Principals and the participants (Participants B to G) as essential for problem-solving.

<table>
<thead>
<tr>
<th>Theme:</th>
<th>School One</th>
<th>School Two</th>
<th>School Three</th>
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<tbody>
<tr>
<td>1. Expertise</td>
<td>Principal, A, B, E</td>
<td>Principal, C, D</td>
<td>Principal, F, G</td>
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<tr>
<td>2. Vision</td>
<td>Principal, A, B, E</td>
<td>Principal, C, D</td>
<td>Principal, F, G</td>
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<tr>
<td>3. Values</td>
<td>Principal, A, B, E</td>
<td>Principal, C, D</td>
<td>Principal, F, G</td>
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<td>4. Staff Alignment With Goals</td>
<td>Principal, B, E</td>
<td>Principal, C, D</td>
<td>Principal, F, G</td>
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<tr>
<td>5. Knowledge</td>
<td>Principal, B, E</td>
<td>Principal, C, D</td>
<td>Principal, F, G</td>
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<tr>
<td>6. Constraints</td>
<td>Principal, B, E</td>
<td>Principal, C, D</td>
<td>Principal, F, G</td>
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<tr>
<td>7. Problem-Solving</td>
<td>Principal, B, E</td>
<td>Principal, C, D</td>
<td>Principal, F, G</td>
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<tr>
<td>8. Change Management</td>
<td>Principal, B, E</td>
<td>Principal, C, D</td>
<td>Principal, G</td>
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<td>9. Conversation</td>
<td>Principal, B, E</td>
<td>Principal, C, D</td>
<td>Principal, F</td>
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<td>10. Principal’s Affect</td>
<td>Principal, B, E</td>
<td>Principal, C, D</td>
<td>Principal, G</td>
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<tr>
<td>11. Professional development of Staff</td>
<td>Principal, B, E</td>
<td>Principal, C, D</td>
<td>Principal, F</td>
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<tr>
<td>12. Intuition and Creativity</td>
<td>Principal, B, E</td>
<td>Principal, C, D</td>
<td>Principal</td>
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<tr>
<td>13. Delegation Collaboration and Empowerment</td>
<td>Principal, B, E</td>
<td>Principal, C, D</td>
<td>________</td>
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<tr>
<td>14. Risk-Taking</td>
<td>B, E</td>
<td>Principal, C, D</td>
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Table 2 – Participant Support for Each Theme
Table 3 – Characteristics of Expertise and Group Problem-Solving Processes and Strategies

Table 3 above illustrates that one of the main characteristics of Principal expertise demonstrated in this research is a strong commitment to shared goals. Aligning the staff with the goals for the school occurs by different means and may occur by the Principal being innovative and up-to-date with recent educational research as evident at School One or the Principal leading by example at School Two. The Principal of School Three encourages staff to adopt goals by having a theme each year, which acts as a focus for team discussions and school activities. A definite vision is important for staff alignment with goals and this is communicated at each school by a conversation, a reiteration of a message or values, which define each setting. Similarly, managing change involves taking risks as well as being both aware of and
attempting to remove the constraints, which impede progress to the attainment of
goals.

Although knowledge is viewed by most participants as essential to expertise and
defining problem-solving, knowledge may be unavailable to assist in the solution of
challenging, difficult problems. Problem-solving may not be entirely rational and the
three Principals rely on intuition and creativity, experience, a sense of optimism and
seeking advice in problem-solving. These characteristics together with the Principals’
values may assist when there is a lack of knowledge about an issue. Each Principal’s
affect may influence problem-solving, in that a calm demeanour may cover inner
turmoil in solving difficult problems. Finally, professional development of the staff is
seen as important in the three schools studied.

Research question one refers to the characteristics of leadership expertise evident in
these Principals. Goal sharing is particularly important with staff alignment occurring
through a strong sense of vision, which is communicated by a conversation with the
school community. Similarly, the Principal’s contribution to the long-term development
of the staff, which includes both professional development and collaboration in
decision-making is a feature of expertise. Additional characteristics of expertise
evident in this research include knowledge and lifelong learning, intuition, having an
understanding of the global and group context, personal and social skills, empowering
staff, leading organisational change, linking learning areas, building the community
and managing the culture. Some of these characteristics appear as themes, for
example, knowledge, empowerment and intuition when they are strongly evident in
each school with support by the various participants. Other characteristics of
expertise, such as, linking learning areas and managing the culture are considered
minor and do not appear as themes since they are only mentioned in one school and
may not be confirmed by triangulation. As such, they are interesting comments and
are included as worthwhile statements rather than themes.

Research question two refers to the skills that these Principals use to obtain solutions
to problems. Participants at all schools refer to organisational learning, collaboration,
common goals, values and affect as significant in expert problem-solving. Additional
skills used in problem-solving comprise a reliance on knowledge combined with
intuition and creativity. An overlap exists in this study in certain characteristics of
expertise and problem-solving processes. Both common goals, or aligning the staff
with goals and collaborative decision-making appear as characteristics of both
Principal expertise and problem-solving.

E. Discussion

Discussion of the characteristics of expertise and problem-solving as outlined in the
Literature Review and the themes which emerged in the three case studies indicate
definite elements of expertise and group problem-solving in the Principals studied.
This research strongly supports two characteristics of expertise as stated by Leithwood et al. (1994: 78) and Leithwood and Steinbach (1995: 123). The first characteristic supported is goal sharing evident in each Principal’s strong concern for the development of and agreement to common goals. The second characteristic of Principal expertise which is evident in this study is the Principal’s contribution to the long-term development of the staff which includes both professional development and collaborative decision-making processes. Cognitive flexibility was not revealed as a main theme in this study. Less support was found for the Principal using the capacity of the staff to obtain solutions. Whilst the Principals rely on senior staff, either individually or for team problem-solving, they do not appear to rely on the talent of the general teaching staff. The range of perspectives in the discussion of issues by the three Principals tends to be confined to senior levels of management in each school.

Other characteristics of expertise were found: knowledge, lifelong learning, intuition, vision, Principal problem-solving abilities, personal skills which include conversation and the Principal’s ability to work with a team (refer to Table 3 above). These additional characteristics of Principal expertise had support by two or more participants. Additional minor characteristics of expertise which were stated by one participant only, include: an interest in the school, developing a global perspective as well as knowing the group context, empowering the staff, leading organisational change, linking learning areas, building the community and managing the culture.

Characteristics of Principal problem-solving in this research concur with the five processes used by experts to obtain solutions as stated by Leithwood et al. (1994: 84, 199) and Leithwood and Steinbach (1995: 103, 142). There is strong support for organisational learning and systems thinking, collaboration, common goals, reliance on certain values and affect, involving emotions and moods. Various values, for example, a strong sense of justice, hard work and commitment to an ethos have been specified in this study. Whilst experts may not be as calm as they may appear, the experts in this research inevitably display outstanding social skills dissipating any potential effects of a lack of calm. This study partly clarifies the means by which an expert Principal encourages staff alignment with goals. In all schools, there was a strength of vision communicated through a strategic conversation. Constraints need to be recognised and understood by the Principal as this influences the ability to take risks and the likely success in achieving goals.

Additional aspects of problem-solving are evident in this research, including the importance of Principal knowledge, intuition and creativity in devising problem-solving strategies. Similarly, various techniques in problem-solving in schools are apparent, for example, the creative solutions as posed by Total Systems Intervention (Flood, 1995: 21), strategic planning (Quong, Walker & Stott, 1998: 78) and scenario planning (Davies & Ellison, 1997: 78; van der Heijden, 1996: 7). These strategies, together with utilising the strategic intelligence of the school (MacGilchrist, Myers & Reed, 1997:
104), can provide a “creativity” to plan the action needed for school improvement and the possibility of an “efficient reliability” (Leithwood, 1999: 35) in student learning outcomes.

Of interest is the overlap between expertise and problem-solving (refer to Table 3 above). The results from this research indicate that a strong commitment to common goals is a characteristic of Principal expertise as well as a process used in group problem-solving. In addition, collaboration as an element of the Principals’s concern with the long-term development of the staff overlaps with collaboration as a problem-solving process used by experts to obtain solutions in groups. These two prominent and overlapping characteristics, common goals (conveyed by a vision which recognises constraints and is communicated by a strategic conversation) and collaboration are complemented by the Principal’s knowledge base and intuition and creativity as both features of expertise as well as problem-solving.

The findings of this research listed in Table 3 have been placed in the following model (Figure 1), which attempts to list the characteristics of both Principal expertise and problem-solving and to illustrate the overlap and interrelationship of leadership attributes. The diagram, however, refers to the main findings and does not include the minor additional characteristics of expertise, which were supported by only one participant.
Leithwood et al. (1999: 99) contend that it is fundamental to attempt to understand the thinking and problem-solving processes of leaders in order to appreciate leadership practices. An attempt to understand the thinking of three Principals has occurred in this study. In the next section, the implications of this research will be discussed and future research directions indicated as a conclusion to the study.

F. Implications for Further Research

“Like the development of expertise itself, learning about expertise is a long-term proposition.” (Leithwood & Steinbach, 1995: 311) Guidelines for establishing degrees of expertise would be valuable rather than just the division non-expert/typical Principals and expert Principals. It is important to clarify the differences between expert and typical Principals with degrees of expertise defined, particularly since one of the objectives for further research on expertise may be for training in the development of expert leadership as well as to assist in the selection of Principals.
“The study of the acquisition of expert levels of performance represents a promising new approach to understanding the development of competence as an educational administrator” (Wagner & Carter, 1996: 474).

Additional information about Principals’ problem-solving processes in groups together with the relationship to overt leadership practices may assist the understanding of Principals’ thinking that leads to action. For instance, can variations in patterns of practice be explained by differences in strategies of problem-solving? Descriptions of overt administrative behaviour by themselves contribute little to either understanding administrative practice or improving it (Leithwood & Steinbach, 1995: 89). It is important to appreciate how school leaders think about the wide variety of problems they face in the varied contexts they encounter. That is, there is value in understanding the strategic decision-making of Principals. Although not part of this research, more studies could be conducted to examine the possible relationship between problem-solving processes and leadership theories.

Future research could also concentrate on the skills used in group problem-solving, that is, the five processes suggested by Leithwood et al. (1994: 84, 199) and Leithwood and Steinbach (1995: 103, 142) to determine their relative importance and the possibility of additional, as yet, unrecognised processes. There is scope for an improved understanding of organisational learning and systems thinking, collaboration, setting common goals and encouraging staff alignment and the importance of the Principals’ values in leadership practices. An expert Principal’s goals for the school are more inclusive, embedded in a vision and values are pervasive in problem-solving, particularly for experts. A clear sense of their own personal and professional values provides expert Principals with a means to solve problems about which they may have little domain-specific knowledge (Leithwood & Steinbach, 1995: 312; Leithwood et al. 1999: 106).

A characteristic of ill-structured problems may be that they are mainly about choices and compromises based on values. Values shape a leader’s view of the current and desired goal state and are central in the choice of actions to reduce the perceived gap. Values seem likely to exist in two forms, implicit and explicit values (Leithwood et al. 1999: 106) both of which can influence actions and problem-solving. Leaders may not be consciously aware of the strength of influence of implicit values but may have much more control over the effects of explicit values. A clear understanding is needed of Principals’ values, the values used when solving challenging problems, the values of others with a stake in the problem and how to productively resolve value conflicts.

Cognitive flexibility as a characteristic of leadership expertise was not apparent in this study and presents a tension with both the literature and an earlier study (McKeand, 1997: 76). The confounding evidence means that cognitive flexibility would be worthwhile examining in further research in an attempt to clarify the contradiction. Is this characteristic of expertise absent or is it present but simply not as important and...
obvious as other dimensions, such as, knowledge and/or intuition and creativity, for example? Other possibilities for the apparent absence of cognitive flexibility may be the labeling devices used in the research, the gender and roles of the Principals studied and the sizes of their schools.

Leithwood et al. (1999: 107) contend that expert leaders are better able to control intense moods and remain calm during problem-solving, are more self-confident about their ability to solve ill-structured problems and treat staff with consistent and genuine respect and courtesy during their interactions. This research study indicates that although the three Principals appeared confident, a calm mood was only on the surface and there may be much concern, even turmoil inside.

To what extent are such mood states a function of the sense of self-efficacy that experts have acquired from experience, both as a result of success and learning from failure? Yet, confidence and collaboration encourage the inclination of experts to share aspects of non-routine problem-solving with other staff, in recognition of the limits of one person’s thinking abilities and to obtain a range of perspectives. Further research is needed to fully understand the relationship between commitment to shared goals, collaboration as a feature of the Principal’s commitment to the long-term development of the staff and the use of the talent of the staff to find solutions. Increased understanding of the interrelationships would be worthwhile even though it may only be the senior staff who are involved in joint problem-solving with the Principal, as indicated in this study.

Leithwood et al. (1999: 128) demonstrate that Principal leadership exercises its strongest independent influence on school improvement planning, school structure and organisation, school mission and school culture. Furthermore, teachers are more likely to associate their Principals than their teacher-leader colleagues with effective management (Leithwood et al. 1999: 128). As Lakomski (1995) claims, the research evidence on school leader practices is limited, with further evidence required on cause-and-effect relationships of leadership variables and a theory explaining the relationship among variables. Future research directions need an increase in the number of Principals studied together with a variety of data to explore more explicitly the relations among components in problem-solving. Numbers have tended to be limited, for instance, in Leithwood and Steinbach’s research (1995: 196) on cognitive flexibility, six experts and sixteen non-expert Principals were studied.

More grounded research examining the themes presented in this study, such as knowledge, intuition and creativity, or indeed any additional themes which may be revealed, may well complement the artificial problem situations used by other researchers to study expertise and problem-solving. What is the relationship between the rational problem-solving strategies and the more intuitive, creative techniques as evident in this research? Is intuition and creativity a feature of problem-solving in different types of schools and in male Principals? Leadership attributes of female...
 Principals together with male Principals could be compared to highlight possible gender differences in problem-solving. Is a conceivable difference due to gender or other variables, such as, professional training and knowledge, experience in the Principalship and the culture of the school?

Principals in a number of different independent, state and various religious denomination schools in Victoria could be interviewed in future research to develop rich, thick descriptions of Principal expertise in disparate schools. Very little of this has occurred to date (Leithwood & Steinbach, 1995: 313). Likewise, both primary and secondary Principals could be interviewed to establish if there are different requirements for problem-solving according to the educational setting. In this research, only senior staff were interviewed to determine their perceptions of Principal leadership but a study could be broadened to include the perceptions of the general teaching staff. Further exploration of the topic will only assist in developing strategies for present and future Principals to acquire both expertise and effective problem-solving capabilities. Similarly, the nature of problems encountered by educational leaders may be a link between expertise and any improvement in the training of future school leaders. Such problems define the domain-specific knowledge upon which experts depend. Research on domain-specific knowledge, including future problem domains for school leaders as evident in this study, may assist in the development of effective problem-solving strategies.

A multi-disciplinary approach, involving the cognitive sciences and educational administration is recommended for further research about the characteristics of school leadership expertise, the problems encountered by Principals and the processes, skills and knowledge used in their solution. In addition, research in the business administration and management area on strategic thinking, strategic planning and scenario planning may well highlight techniques already in use or possibilities for future problem-solving in the educational setting.

G. Conclusion

This study then, explored the nature of expert administrative practice to highlight Principals’ internal thought processes and their direct relationship to Principals’ practices. Four dimensions of expertise were defined in this research, followed by a comparison of the processes used by expert Principals, in contrast to non-expert Principals, to solve problems in groups. Three Principals from K to Year 12 independent girls’ schools in the metropolitan area of Melbourne and two senior staff from each school were interviewed to give insight into Principal leadership. The emphasis was on both the Principals’ understanding of their own leadership together with the perception of senior staff of their Principal’s leadership.

Fourteen leadership themes emerged which were related to both expertise and problem-solving skills applicable to these three Principals. This research supported...
two characteristics of expertise as posed by Leithwood et al. (1994: 78) and Leithwood and Steinbach (1995: 123). These characteristics are: the Principal’s strong concern for goal sharing, together with the Principal’s contribution to the long-term development of the staff, both through professional development and collaboration in decision-making. Although cognitive flexibility was mentioned as an aspect of expertise, it was not revealed as a main theme in this study. Further research on cognitive flexibility may clarify the dilemma and tension noted here. Similarly, the Principal using the talent of the staff was only evident in that senior staff were relied upon for their leadership expertise in joint problem-solving, not the general teaching staff. Additional characteristics of expertise which had support from two or more participants but not necessarily referred to in the literature as relating to Principal expertise were: knowledge, lifelong learning, intuition, vision, Principal problem-solving abilities, personal skills, including sound communication and empathy and finally, the Principal’s ability to work with a team. These additional characteristics need to be examined further in subsequent studies to determine their impact on leadership behaviour.

Characteristics of group problem-solving in this research support the five processes used by expert Principals to obtain solutions as stated by Leithwood et al. (1994: 84, 199) and Leithwood and Steinbach (1995: 103, 142). There is strong support for organisational learning, collaboration, common goals, values and affect. Although Principals in this study may not be as calm as they projected, they do rely on outstanding personal skills and strong values. The three Principals in this study encouraged staff alignment with goals by strength of vision communicated through a strategic conversation, often a repetition of mission and values statement. Additional themes revealed in this research indicate the importance of Principal knowledge as well as intuition and creativity in devising problem-solving strategies. Problem-solving may not be as logical as perhaps once thought. Since all the facts and knowledge may not be available, Principals in this study used intuition and creativity to complement knowledge and experience, to tackle organisational ‘messes’ (Flood, 1995: 21) where no two problems present in the same way.

Although values may assist in solving swampy issues where knowledge is uncertain or lacking, this study indicates that other factors, such as, experience, optimism, advice, both from other senior staff and outside, as well as intuition, may be involved. The Principals were involved in creative, strategic thinking and often used scenario planning (Davies & Ellison, 1997: 78; van der Heijden, 1996: 7) to utilise the strategic intelligence of the school needed for educational improvement as suggested by MacGilchrist et al. (1997: 104). In addition, the variety of characteristics of both expertise and problem-solving strategies evident in the three Principals in this research comprise sophisticated, sensitive reflective leadership as encouraged by Begley (2000). Certain characteristics of expertise are also features of Principal problem-solving, particularly a strong commitment to common goals (enhanced by a vision which recognises constraints and is communicated by a strategic conversation).
and collaboration. These two definite characteristics are complemented in this study by the Principal’s knowledge, together with intuition and creativity, as features of expertise as well as problem-solving.

These characteristics of Principal leadership require further research with greater understanding of characteristics of leadership expertise, the nature of problems and strategies that Principals employ to solve problems in different educational contexts. Future studies may assist in understanding the evolving nature of leadership during periods of rapid change. A suggestion is to combine future research on expertise and problem-solving, in much the same way as studies on school effectiveness and improvement in student learning outcomes have been amalgamated. In addition, the extension of these three case studies to include Principals of other types of schools, to comprise independent, primary and secondary schools, religious affiliated and international schools may clarify expertise and assist Principals in the process of leadership which necessarily includes the implementation of problem-solving strategies.

“What leaders do depends on what they think. So if we are to understand the sources of those leadership practices that are productive in changing times … no source could be more fundamental than the thinking and problem-solving processes of leaders engaged in those practices.” (Leithwood et al. 1999: 99).
REFERENCES

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