

Farmers and learning: a critical interpretive analysis of the value perception of education and complementary factors to success

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Abstract. The family farm comprises a business in which lifestyle and personal considerations interact strongly with management decisions. The 'lifestyle' influence indicates that farmers are not motivated by monetary success alone, and with the failure of narrow economic models of farm decision making, it is important to be able to assess farming performance in other broad areas. This study has identified a group of high performers and a group of low performers based upon an extended model of measuring business performance. The business performance indicator was then used to identify other key components that indicate success, for example attitudes and values, self-efficacy, progressive management strategies and education factors. This paper focuses on one of the key findings of the original study, that is, that there was no significant difference in levels of formal education between the top and bottom groups of farmers, though a training index indicated that the value of education was recognised by the top 20% performing farmers as a key factor to success. The paper identifies key characteristics of successful training models from a farmers' perspective and closes with implications and recommendations.

Keywords: critical interpretive research, farmers education

Background

There is a wide variation in family farm business performance in Australia. ABARE (2000) identified a widening gap between the top 20% of farm businesses and the rest, based on the performance indicators; operating cash surplus and return on capital. The traditional approach has been on improving knowledge related to operational effectiveness in order to increase production while containing costs. Porter (1996) examined non-agricultural business and found that operational effectiveness needs to be combined with other actions based on attitudinal behaviours. There was a need to know what it is that successful family farm business managers do differently from their peers.

Adoption of best practice is an important objective of Agriculture-Advance Australia (AAA) policy which aims to stimulate training to facilitate change based on the proposition that new knowledge will improve performance through increased ability. Kilpatrick (1996) established a positive correlation between farm business performance and post school agricultural education. The critical components of that education were not assessed. Education providers have concentrated on production-focused knowledge and skills with a more recent shift to business management skills. It has been assumed that through the acquisition of knowledge, change will take place and hence performance will increase.

Limited information exists on the critical characteristics of successful farm managers although a number of descriptions of the business characteristics and the performance levels of high performing family farms are available. The business characteristics are the result of management skills of the family management team. The capabilities and motivation of the team members are the critical inputs that produce good performance (O'Callaghan *et al* 1997). It is these individual attitudes and characteristics that influence and prompt effective behavioural changes that need to be identified.

The attitudes of farmers towards education are well documented with consistent references similar to "farming is best learnt on the job" (Hawkins *et al* 1974; Salmon 1980; Clark 1987; Napier and Scott 1994; Johnson, Bone and Knight 1996; Bamberry, Dunn and Lamont 1997). The last named suggested that little concise evidence exists of a strong relationship between levels of formal education and agricultural productivity. Buggie, within that document, argued that farmer's intelligence, knowledge and self-awareness were more significant factors than education. In contrast, Synapse (1998) recommended that strategies to improve education and training

participation be of high order priority. They further recommended the investigation of attitudes to education and training of local farm leaders and how leaders can be used to support training.

The data collected for this paper came out of a much larger research project, funded by the Rural Industries Research & Development Corporation, that aimed to identify the top performing and the bottom performing family farm businesses based upon business performance, and then to compare and contrast the perceptions and attitudes towards acquiring management skills and attributes that lead to improved business performance.

The main objectives of the larger research project were to:

- Identify the farm business performance
- Identify farmer's priorities towards profit generation and other aspects of farming and family life that may impinge on the pursuit of profits
- Identify the relative level of self-efficacy held by the farmer
- Identify what farmers see as being the attitudinal factors leading to success
- Determine if farmers can describe their perceptions of how successful farmers have obtained the skills and attitudes that promote success
- Determine if farmers believe that the attitudes and skills necessary to promote success can be taught in formally structured learning experiences.

The key findings were, firstly, that for all farmers the maintaining of a stable family relationship was of paramount importance in the running of the farm business. Secondly, that the top 20% of farmers had high levels of self-efficacy and thus possessed the capability and the competence to perform tasks successfully.

An important finding that led to the development of this paper was that there was no significant difference in levels of education between the top and bottom groups of farmers. However, there was a significant difference between the ages with the top 20% (45.5 years) being, on average, eight years younger than the bottom 20% (53.6 years).

Methodology

An existing Business Performance Indicator (BPI) instrument (Sefton 2002) was expanded to give a more realistic measure of business performance. This BPI was used to identify the top 20% of performers and the bottom 20% of performers of family farm businesses included in the study. In order to reflect the overall business performance, measures were envisaged that would pick up on various aspects of business activities including income generation, financial performance the impact of debt and the utilisation of assets. A major departure from most business performance measures was that the researchers were looking for measures that reasonably reflected both business performance and the respondent's perceptions of their respective businesses. The decision was made to find a range of measures that obtained an overall picture of business performance across a number of financial indicators coupled to respondent assumptions as to changes in business capacity and changes to the family's overall wealth. The indicators that were used to measure the BPI were the average turnover on assets; earnings on capital; debt to income ratio; operating costs to income; finance cost to income; nominal wealth change; and changes in business scale. Therefore, 'success' for this study was defined as those farming farm enterprises that fell into the top 20% of the calculated results for the BPI.

In order to achieve the greatest potential population sample and to maintain a standardised method across both states (NSW and Victoria) an approach was made to a Sydney organisation, Axiom Databases, part of Axiom Australasia Pty Ltd. They were briefed on the research requirements relating to the random generation of lists based on enterprise types and geographic location. Using extensive face-to-face interviews quantitative and qualitative data were obtained from the random sample of 200 family farm businesses involving 308 individuals (100 females, 208 males), representing the farm management team, from New South Wales and Victoria covering a range of farming enterprises. The 308 individual responses were treated as the unit of analysis. The mean age of the respondents was 49.3 years for the males (median 50) and 47.8 years (median 48). The respondents were:

- Family members active in the farm activities
- Owner operators
- Farming families with agriculture represented as their family's main source of income; and
- A business large enough to be registered as a primary producer for GST purposes (primary production turnover in excess of \$50,000 per annum)

Specific aspects explored in the research project were:

- Business performance
- Attitudes and values (including self-efficacy)
- Skills
- Education and training

The interview used a semi-structured approach involving the asking of structured questions followed by clarifying unstructured, or open-ended questions. The unstructured questions facilitated explanation and understanding of the responses to the structured questions. Thus, a combination of objectivity and depth was obtained, and the results could be tabulated as well as explained. The structured items consisted of a question and a list of alternative responses from which the respondent selected. Likert scales were also used in structured items and respondents were asked to indicate their level of response to particular questions. The interview consisted of three separate sections, each allocated to specific objectives of the project. The three sections were Whole Farm Analysis, Individual Responses and Financial Analysis.

The interviews allowed the collection of in-depth data and the detailed measurement of business performance not possible with either a telephone or postal survey. By establishing rapport and a trust relationship with the farmers the interviewer could obtain data about financial statements and supporting information that the farmers would not give on a questionnaire. The interviewer could explain and clarify both the purpose of the research and the individual questions and could follow up on incomplete or unclear responses by asking probing questions. Interviews were conducted in the home of the respondent. The one researcher conducted all interviews to maintain consistency of approach and methodology.

The study investigated the degree of correlation, if any, between attitudes of farmers and their farm business performance. The *t* test, was used to determine significance differences between the identified categories in the study. Chi square, a non-parametric test of significance, was used to compare those data which were in the form of frequency counts occurring in two or more mutually exclusive categories. In this study, the identified categories were the top 20% of business performers and the bottom 20% of business performers. Multiple regression analysis was used to relate various measures (e.g. business performance and self-efficacy) to attitudinal measures. Stepwise regression methods were used to obtain a parsimonious model in which all terms were significant. GenStat version 6.1 was used to correlate the results.

Qualitative data in the larger study was analysed by coding responses and identifying major themes. This information was not used in this paper.

Results

Educational indicators

The education level of each respondent in the study was determined from a cumulative score taking into account the highest level of schooling, post secondary courses and training and *ad hoc* training courses. The formal education levels of the two groups were found to be comparable, with no significant difference ($p > .01$). In reference to attendance at school it was found that:

- The top 20% attended school for an average of 10.69 years and
- The bottom 20% attended school for an average of 10.70 years.
- The average of school attendance for all respondents in the study was 10.76 years.

For tertiary education:

- The top 20% had attended for an average of 2.92 years whilst
- The bottom 20% attended for an average of 3.22 years.
- The average for all respondents was 2.85 years.

Thus acquisition of knowledge from formal education did not necessarily lead to change that would improve performance. Performance was a factor of ability and motivation and the findings indicated that attitudes (self-efficacy, self-confidence, motivation, positive thinking, pro-activity, will to achieve) could enhance or inhibit the propensity to change and improve performance. Previous studies have had contrasting results when dealing with the issue of level of education and level of farming success. For example, Bamberry, Dunn and Lamont (1997) suggested little concise evidence existed of a strong relationship between levels of formal education and agricultural activity but Kilpatrick (1996) found that successful farmers were more highly educated.

In a later study, Kilpatrick and Johns (1999) found that more progressive farmers were proactive in identifying and meeting learning needs in management and marketing and were also the group most likely to have used training in learning for change. Less progressive farmers were seen to be struggling to keep up with the information available to them.

Other factors leading to success

Success for the family farm business was seen to relate not only to the financial health of the business but also to the lifestyle or intrinsic qualities of the farm. However, not all family farm businesses are alike. Whilst most farmers have achieved the lifestyle they want and enjoy the challenge of farming, this project revealed that there were still large differences in business performances and attitudes towards achieving higher business performances.

The study identified what farmers considered the main skills and attitudinal factors leading to success. The responses indicated that family environment was the main factor, followed by personality and self-belief, experience and then education and training.

Family environment

For all farmers the maintaining of a positive, stable family relationship was of paramount importance in the running of the family farm business and the belief that attitudes were largely shaped within the family situation. Three quarters of the top 20% ranked family as their personal priority over business, community, environmental and welfare issues, and knowledge issues, though the aggregate does not indicate differences between the two groups as observed in Table 1.

Table 1. Personal priorities in relation to all issues

		All respondents	Top 20%	Bottom 20%
Issues		Rank 1	Rank 1	Rank 1
a	Environment & welfare Issues	4.6%	1.6%	6.8%
b	Community Issues	1.0%	1.6%	1.7%
c	Knowledge Issues	3.3%	0.0%	1.7%
d	Family Issues	79.8%	75.4%	84.7%
e	Business Issues	11.3%	21.3%	5.1%
	sum	100.0%	100.0%	100.0%

Personality and self-belief

Learning to be a farmer had numerous psychosocial or attitudinal barriers associated with previous educational experience and the perceived value of these experiences. Clarke (1987), in a comprehensive study on barriers in education, and Woodford and Collins (1989) considered that attitudes were the most significant barriers. The view of many Rural Counsellors was that the prime impediment to adoption of change strategies in much of the farming community was associated with resistant attitudes. Chudleigh (1998) stated that the major common factor in most successful enterprises was, in fact, the attitude, knowledge and skills of the manager. Despite these facts, many of the farmer training programs are directed at skill improvement and commonly do not address attitudinal change.

Measures of self-efficacy have been well developed by Bandura and Wood. Bandura (1994) stated that self-efficacy is concerned with people's beliefs in their capabilities to exercise control over their own functioning and over events that affect their lives. Self-efficacy is developed by four main sources of influence:

- Mastery experiences
- Vicarious experiences – seeing people similar to oneself manage task demands successfully
- Social persuasion that one has the capability to succeed in given activities
- Physiological states – inferences from somatic and emotional states indicative of personal strengths and vulnerabilities

Family, peers, education and time of life can all have an effect on a person's level of self-efficacy. This study used the work of Bandura to formulate a series of questions where the cumulative scores would give a more accurate indication of the level of self-efficacy of the respondents.

Some people perceive situations as an opportunity or a challenge; others see the same situation as a threat or too difficult. Carlopio *et al* (1997:419) put it down to empowerment ... *when people are empowered, they have a sense of self-efficacy, or the feeling that they possess the capability and competence to perform a task successfully. Empowered people not only feel competent, they feel confident that they can ... learn and grow to meet new challenges. ... Many believe that this is the most important element in empowerment because having a sense of self-efficacy determines whether people will try to persist in attempting to accomplish a difficult task.*

Self-efficacy

Wood *et al* (1990), Wood and Bandura (1989) and Wood and Locke (1990) have shown that people with a strong self-efficacy are better able to cope with setbacks and problems associated

with implementing plans. On the other hand, people with low self-efficacy become “more self-doubting, set themselves lower goals and become less systematic in their appraisal and selection of plans” (Carlopio *et al* 1997:420).

The results in this study showed a strong relationship between the BPI score and level of self-efficacy. The top 20% of farmers, with matching high levels of self-efficacy, had a significantly stronger belief that they were capable of positive outcomes from their own actions. They believed that they had the capability to perform tasks, meet new challenges and the persistence to accomplish difficult tasks (Carlopio *et al* 1997). The bottom 20% was not as confident, tended to set themselves lower goals and was less likely to use analysis to assist in planning and identifying efficient production methods.

The level of self-efficacy was also a more significant factor in determining business performance than some other factors, for example, level of education. Bamberry, Dunn and Lamont (1997) suggested little concise evidence exists of a strong relationship between levels of formal education and agricultural activity but, in contrast, Kilpatrick (1996) found that successful farmers were more highly educated. Barriers to further learning have been linked to low self-efficacy and esteem in that people often underestimate their own experience and knowledge and overestimate others (Johnson, Bone & Knight 1996). Farmers were often working in isolation and thus found it difficult to conceive alternatives to their working situation.

Thus, should a farmer believe that extra training or education will not have a beneficial impact on their overall business performance they were likely to consider such training to be irrelevant to immediate needs and not to justify the time, cost and disruption to “farm work” that such training required. Similarly, if a person believed they do not have the skills necessary to benefit from the training being offered, they were obviously pre-disposed to avoid such training. The belief that one’s actions could have a favourable outcome was a critical precondition to the uptake of that specific training unit.

Experience and outside influences

The aggregation of learning option choices confirmed that the top 20% ranked formal education below all other sources of experiential learning. These results were consistent with the studies by Landvall (1992) on innovation that suggested that learning occurred through experience doing the job. Murray-Prior and Hart (1998) also established that farm business management activities were more likely to be successful if they focused on hands-on activities with a considerable amount of interaction between the participants. This informal learning occurs when an individual decides that they need to know something to do their job and takes steps to learn it. Informal learning was self-motivated, self-directed and purposeful. It followed that the top 20%, with high levels of self-efficacy, were more likely to initiate informal learning opportunities in their workplace. Informal learning was predominantly experiential and non-institutional. Therefore, future education and training courses could assist this learning process by providing appropriate learning guides and mentors in order to develop attitudes and skills and produce explicit knowledge.

There were no significant differences ($p > .01$) in priorities in relation to knowledge issues between the two groups and the top two ranking priorities were common; “*thinking up new and more efficient ways of doing things*” and “*utilising the skills I already have*”. However, after the first and second scores the priorities varied as seen in Table 2. The results may indicate a level of creativity common to all farmers. There was a difference in percentage between the top 20% and the Bottom 20% for “*thinking up new and more efficient ways of doing things*” and for “*seeking out new technology*”. “*Enrolling in courses – any type suited to your needs,*” “*reading newspapers*” and “*contributing to groups*” were the lowest priority for both groups. Also, the top 20% tended to rely more on their accountant and advisers to keep them up-to-date. However the top 20% evidenced a higher regard for education as a condition to farm business success (see training index in Table 3).

The top 20% ranked seeking out new technology and high production methods more highly than the Bottom 20%. The top 20% appeared to be more confident and sure of themselves, willing to back their own judgements and concentrating on doing things well. The bottom 20% were looking for others for advice, e.g. attending field days and seminars, more so than the top 20%. One reason given by the Top 20% on why they ranked attending field days and seminars so lowly was that they often had their own ‘knowledge network’ to call upon. This network included other top performers, consultants, people with common interests and other sources beyond the choices given in the survey. The top 20% indicated that they knew where to look for information and were confident in seeking and building networks to gain the knowledge they needed. Vanclay, Mesiti and Howden’s (1998) work on farming sub-cultures would confirm this need and the tendency for

farmers to cluster according to expectations of each other, common interest and similar levels of success.

Table 2. Personal priorities in relation to knowledge issues

		All respondents	Top 20%	Bottom 20%
C. Knowledge Issues		Rank 1	Rank 1	Rank 1
a	Learning the secrets of really high production	12.1%	10.0%	8.2%
b	Seeking out new technology	12.7%	13.3%	4.9%
c	Learning how to use the computer for the Internet	4.6%	3.3%	6.6%
d	Thinking up new and more efficient ways of doing things	30.9%	31.7%	44.3%
e	Utilizing the skills I already have	25.4%	25.0%	23.0%
f	Reading rural newspapers, journals or magazines	2.9%	1.7%	1.6%
g	Enrolling in courses - (any type suited to your needs)	2.0%	0.0%	0.0%
h	Regularly attend field days and seminars	3.3%	5.0%	4.9%
i	Contributing member to producer production or marketing groups	2.3%	3.3%	4.9%
j	Rely on my accountant and advisers to keep me up to date	3.9%	6.7%	1.6%
	sum	100.0%	100.0%	100.0%

Education and training

A training index was composed of a suite of questions designed to assess the cumulative attitudes towards training and the individual's involvement in training. Weightings were applied to responses to the questions to reflect the relative level of response, with higher weighting given to activities thought more likely to provide more challenge or higher order learning experiences (Table 3).

Farmers were asked to list the training activities and formal courses, seminars, workshops, field days attended in the past two years. Informal activities were included and the number of activities recorded. In this way a cumulative score was devised.

Even though there were no significant differences in the levels of school and post-school education the Training Index for individual farmers resulted in significant differences between the top and bottom groups ($p < 0.1$). The top 20% had an average Training Index of 35.9 and the bottom 20% an average Training Index of 23.1. The average of all respondents was 29.3. Therefore, the top 20% were more likely to have a more positive attitude towards training and attend more training courses than the bottom 20%. This confirms that education and/or training plays an important role in the perception to success from farmers, though the conflicting issue that remains is the relevance of formal training models considered theoretical and irrelevant to industry; while the demands on-the-farm job require practical experience and self-efficacy.

Table 3. Training Index – categories and weightings

Training category	Weighting applied
Production	1.0
Management	1.5
Personal development	2.0

Current management texts (Robbins, Bergman & Stagg 1997, Davidson & Griffin 2003, Schermerhorn *et al* 2004) recognised that the most effective managers learn their skills through a combination of education and experience and that some form of tertiary education usually provided a foundation before individuals go on to gain experience. However, farm business managers with formal management qualifications are not widespread in Australia (Karpin 1996). Karpin (1996) also pointed out that much of the training and development given to managers was done through short courses, and on-the-job development but there remained the need for formal management education as a foundation for managerial competence.

This study showed that respondents had an average of 2.85 years of post-secondary education. Thus the farmers had a foundation of learning and knowledge on which to build their experience. The study did not identify if the tertiary courses were management courses but the data did reveal that short courses, TAFE and field days, that farmers attended were more focused on specific farming technologies and financial management. There remained a strong belief amongst the respondents that, whilst education was very important, the practical aspects of farming were still best learnt on the job.

The bottom 20% indicated they believed in gaining a good education for their children more highly than the top 20%. Johnson, Bone and Knight (1996) found that if producers were 'struggling' and were pessimistic about the future of farming, they were more likely to see education as a high priority for their children. Education was seen as the 'escape' route towards more 'secure and stable' careers. Many farmers in this study had much greater ambitions for their children than for themselves.

The respondents were asked if obtaining additional management skills in formally structured learning could help achieve idealised profit levels. Approximately two thirds (i.e. 66%) of top and bottom groups believed that additional management skills could help but 22% of the bottom group did not believe so. Approximately 60% of both groups believed there were courses that attempt to teach attitudes and skills necessary to promote success but 17% of the top group did not believe there were such courses and would not attend if there were such courses. The reasons given to why they would not attend, or were unlikely to attend, included the predictable responses of "age" and "time". However, the top 20% believed they were capable of self-education.

Farmers need a combination of attitudes and skills to maximise the chance of financial success. Farmers were asked to indicate their belief as to how important it is for the next generation of farmers to attend formal courses in a list of areas to build appropriate attitudes and skills. The average response level for each individual option, on a Likert scale of 1-5, was that the bottom 20% rated all items slightly higher than the top 20% (Table 5). The five highest ranked items for both groups were very similar. Preparing budgets, monitoring income and expenditure patterns was the most favoured course for both groups. Communication and people management skills had equal top ranking for the top 20% whereas crop and pasture protection was the second highest preference for the bottom 20%. The results suggested that both the top 20% and the bottom 20% had similar perceived training needs.

Respondents were then asked 14, to rate the items on how important it would be for them to take time off the farm within the next two years in order to undertake training on these topics. The results, as seen in Table 4 are lower across the list indicating that while they believed training was important they were reluctant to actually attend such courses. Risk minimisation strategies, preparing budgets, monitoring income and expenditure patterns would be the common choices for both the top 20% and the bottom 20% if they were to attend such courses.

Table 4. Skills and training areas needed to improve performance

	Top 20%	Top 20%	Bottom 20%	Bottom 20%
	Q13	Q14	Q13	Q14
a) Machinery maintenance	3.7	2.2	3.9	2.4
b) Crop & Pasture production	4.2	3.2	4.3	3.2
c) Livestock evaluation and breeding	4	2.7	4.2	3.2
d) Entrepreneurship, successful risk taking and business growth	3.9	3.1	3.9	3.2
e) Communication and people management skills	4.1	3.2	4.1	3.0
f) Implementing new technology	3.9	3.4	4.1	3.3
g) Conducting comparative analysis and benchmarking of potential and existing enterprises	3.7	3.0	3.9	3.2
h) Identifying, researching and developing markets for produce	3.7	3.0	3.9	3.3
i) Using the internet for the financial gain of the farm	3.2	2.8	3.5	2.9
j) Preparing budgets, monitoring income & expenditure patterns	4.1	3.5	4.5	3.8
k) Risk minimization strategies	3.9	3.5	4.2	3.6

Respondents were asked why formal courses might not be an appropriate training tool. The results are shown in Table 5. Consistent responses were gained from the top 20% and the bottom 20%. Almost half of the respondents believed that formal courses were actually part of the solution in attaining attitudes and skills that would promote success, approximately only one third of respondents believed formal courses are appropriate. The length of time taken to complete a formal course was not considered to be an inhibiting factor even though finding time to attend courses was identified as one reason given previously as to why farmers would not attend short courses. Formal courses needed to have "hands-on" practical components.

Table 5. Reasons why formal courses are not appropriate

	Top 20%	Bottom 20%	All respondents
Time	2.4%	0.8%	2.4%
Poor quality/long winded/poorly focussed	4.1%	5.0%	4.1%
Must be hands on	12.2%	13.3%	12.2%
Believe formal courses are appropriate	34.1%	32.5%	34.1%
Formal courses – not the answer but part of the solution	47.2%	48.3%	47.2%
	100.0%	100.0%	100.0%

The top 20% agreed or strongly agreed with the following statements pertaining to education and training:

- Businesses which regularly train managers or employees perform better than those businesses that do not engage in training
- Highly trained people often lack the common-sense necessary to run a profitable farm
- Too many courses are run by academics or failed farmers who don't really know what it takes to be profitable
- Academic and industry leaders are a very important way for farmers to expand their horizons and develop new ideas

The farmers were asked if a way could be found for them to participate in suitable training courses, and, without incurring huge costs, what topics they would choose to study.

The topic of production and sustainability was the highest identified choice by both groups with the bottom 20% scoring it slightly higher than the top group (Table 6). The second and third ranked topics for the top 20% were *“business planning/putting management into action”* and *“personal development/off farm investments”* whereas the bottom 20% second and third ranked topics were *“financial management/financial records”* and *“personal development/off farm investments”* respectively. Neither group identified *“business expansion”* or *“alternative enterprises/profit analysis”* as important topics. *“risk management”* and the *“internet”* also rated lowly.

Table 6. Topics farmers would choose to study

	Top 20%	Bottom 20%	All respondents
Internet	3.7%	3.2%	4.2%
Computers	8.3%	11.7%	9.7%
Risk management	4.6%	2.1%	3.2%
Business expansion	2.8%	0.0%	1.6%
Financial management/financial records	8.3%	12.8%	11.5%
Marketing	9.2%	9.6%	8.7%
Alternative enterprises/profit analysis	0.0%	2.1%	1.4%
Production /sustainability	22.0%	25.5%	26.4%
Business planning/putting management into action	11.0%	9.6%	8.9%
personal development/off farm investments	12.8%	12.8%	11.5%
could not identify courses	17.4%	10.6%	12.7%
	100.0%	100.0%	100.0%

Highlights of successful training models

Below is a list of characteristics a training course would need to have, in order for farmers to be prepared to participate in the course. The question provided a free response. The answers were grouped and allocated the listed characteristics in Table 7.

Both groups ranked *“proven value/relevant/outcomes identified”* as the most important course characteristic. The top group then viewed *“quality presenters”* and *“short/suitable timing”* as the next two characteristics required for them to participate. The bottom group identified *“short/suitable timing”* and *“hands on/practical experience”* as their second and third preferences.

Respondents agreed that group learning with other farmers was not a highly favoured characteristic but courses must have sessions of short or convenient duration, so they can fit in between the busy farming periods. They also agreed that quite a few farmers would not enrol in formal courses because they were afraid of being asked questions that may embarrass them.

Table 7. Course characteristics

	Top 20%	Bottom 20%
Short/suitable timing	12.6%	15.5%
Flexible delivery & assessment	4.2%	4.7%
Small groups	1.4%	0.0%
Close by	7.7%	6.2%
Proven value/relevant/outcomes identified	23.8%	29.5%
Hands on/practical experience	10.5%	12.4%
Peers present/discussions	4.9%	5.4%
Quality presenters	14.0%	9.3%
Business focus	2.1%	1.6%
Production focus	4.9%	2.3%
Other	14.0%	13.2%

Both groups agreed on the following statements (scores greater than 3.2 on a 1-5 Likert scale):

- Most farmers need personal contact and discussion when training, as it helps to help reach an understanding of how others think.
- A good way for farmers to access formal training, is by having a practical farmer with education skills providing them with tailor-made modules suited to their personal learning needs.
- We need one internet site with all the different courses available with course contents, delivery method, presenter, cost, date, venues, etc.

The high priority given to training in production technology by farmers was recognised in studies by Kilpatrick and Johns (1999). In our study production skills and planning ability ranked highly for top farmers to develop. The acknowledgment of the importance of planning suggests that the survey sample was identifying that management skills are now seen to be equally important as production skills by farmers. Farmers need problem-solving skills because this is the main way of developing new knowledge and experience.

The similarities between the top 20% and bottom 20% in the selection of the skills required by both top line managers and 'struggling' managers suggested that training in these skill areas should be relevant to most farmers. The challenge for education providers is in designing the curriculum and the delivery methods to meet the learning needs of the individuals who participate. Farmers' participation in the learning process will be conditional upon the value they place on the learning and this may be conveyed through their own experience of that of other learners (Billet 1993). Strategies that use relevant examples and farm experiences will be especially effective. Further learning should then incorporate both formal and informal strategies.

The curriculum should also develop the meta-cognitive skills of pro-activity, critical reflection and creativity. These meta-cognitive skills of 'learning how to learn' are not easy. The farmers may have to engage in the 'unlearning of long-time practices'.

"Risk taking" was perceived by the bottom 20% as an attitude required for top line managers. The top 20% did not rate "risk taking" as highly for top line managers. Entrepreneurial studies in non-agricultural businesses (e.g. Bird 1989) suggested that entrepreneurial managers do not view themselves as risk takers but others do. This perception could also be the case in this response, where the top 20% appeared to accept risk taking unconsciously. The bottom 20% perceived the risk-taking factor more important for top line managers than 'struggling' managers.

"Self confidence" and "enjoys the challenge of farming" were the two highest ranking attitudes identified by the top 20% for top line farmers. The bottom 20% identified "risk taking" and "self confidence" as their highest ranking attitudes. The attributes of self confidence and self esteem are factors that can be gained from positive work environments and professional development training programs that focus on positive thinking and leadership.

Implications and Recommendations

The implications that arose from these findings included:

- Entrepreneurial characteristics, such as risk acceptance and high levels of self-efficacy appear to be acquired from a combination of formal, informal, and on-the-job learning.
- Topics aimed at developing family relationships and health need to be incorporated into future training programs for farmers.

- Learning experiences based in natural settings, e.g. the farm, using authentic activities have the potential to develop the cognitive capabilities (i.e. the thinking, believing and ideas component of attitude) of transferability and adaptability of knowledge.
- Experiential, continuous, relevant action learning style processes are the ways that motivated successful farmers learn. Learning methods that permit farmers to learn at their own pace and where individual learning styles are considered will lead to increased satisfaction and motivation.
- The consistently high priority of family and business issues suggests that an integrated approach is needed for the design and delivery of education and training programs. The opportunity exists to integrate the training of attitudes and skills with family, sustainable business practices and community issues.

The study findings and associated implications lead to a number of recommendations directed at developing more positive attitudes and higher levels of capability in individual farmers and family farm management teams as follows:

- Further education and training programs, aimed at developing more positive attitudes and higher levels of capability, should incorporate both the structured formal (seminars, workshops) and less structured informal (e.g. coaching, mentoring, trial-and-error and self-directed learning) learning strategies.
- Education and training programs be developed to embrace structured continuous, workplace learning processes aimed at improving self-efficacy, creativity and critical reflection thus improving planning and decision making on farms. An improved self-belief is the key to farmers engaging in further training and development.
- There be a shift from the “injection” style training to one of merging work and learning; to the sharing of the development, transfer and use of attitudes, knowledge, and skills; and to continuous improvements in what is provided, how it is provided and when it is provided.
- Facilitators of the education and training programs must take a long-term view of their role and this could be achieved through an action learning process where farmers have the opportunity to become problem-solvers in the context of real life situations.
- Because of the continuing nature of attitude and skills development, training should be complemented with post training mentoring and monitoring strategies to provide support and to measure progress and improvements gained from training and the application of new skills.

Conclusions

Formal education was a factor in trying to determine the level of success of a farmer in this study but it was found not to be a highly significant factor in statistical terms, though the perception of the top 20% about this issue was positive using a training index method. Family, personality and self-belief, on-the-job experience and short training courses all played a role in ‘producing’ a successful farmer.

There was evidence that current training models do not adequately fit the needs and aspirations of top and bottom performing farmers. Top farmers, in particular did not see the relevance of formal post secondary training and were more interested in on-the-job action learning methods. Learning has to have real value for the participants. The challenge is to extend the practice of merely training farmers in competencies to one of facilitating the learning of farmers and family farm management teams using experiential and action learning approaches. Action learning is an effective process to improve continually one’s practice through a cycle of critical reflection, creativity and pro-activity. These meta-cognitive skills are not easy and may challenge the farmers to alter some deeply held beliefs.

It was important to recognise that attitudes and values play a key role in farming. Willock *et al* (1999) indicated that success in farming involved not only the financial health of the business but also the intrinsic qualities of the farming family and the farm. Farming-related goals were not purely financial in nature. The family farm business was the place of work as well as the place of residence and therefore the “lifestyle” component of farming was very important. Stable and secure family relationships often hold the keys to success. The other key component to success in farming was having a positive attitude and knowing you “can do it”. The attitudinal aspect was paramount in understanding the decisions made by farmers. For example, understanding why some farmers participated in training and some did not; why some farmers were financially more viable than others; why some engaged in progressive management strategies involving pro-activity, creativity and critical reflection skills and some did not; why some were strategic planners (i.e. long term) and others were tactical operators (i.e. focus on short-term); and very importantly,

why some had a stronger belief in their own capabilities to control events that influenced positive behaviour towards improved business performance.

The challenge for farming communities is to create higher levels of self-efficacy and self-confidence surrounded by suitable family environments. Farmers and families with higher efficacy scores appeared to have attitudes that resulted in positive behaviour and acceptance of changing situations. Families with high efficacy were more self-reliant and better equipped to plan and action strategies directed at improving performance across a number of business, farm, social and personal arenas.

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