Are Market Research and Extension Complementary?

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Abstract

Current extension theory and practice in Australia seeks to promote the adoption of agricultural innovations by facilitating the personal development of farmers to create a culture of innovation and continuous learning. However, this approach has not eventuated in higher adoption rates. We propose that an alternative paradigm may offer some insights on this issue. In this paper, we explore consumer behaviour theory as a model of adoption behaviour in agriculture.

Using consumer behaviour theory, we characterise the adoption as a form of high involvement purchasing that invokes complex decision making. This characterisation suggests that producers derive purchase criteria for assessing innovations based on relevant elements of the existing mix of agricultural practices, techniques, and resources available to them. These elements define the farm context for the innovation – usage context in consumer theory parlance. Differences in farm context translate into differences in the purchase criteria used to assess an innovation. This leads to differences in the value of an innovation to producers and, therefore, differences in their propensity to adopt. In principle, producers can be classified into ‘market segments’ for an innovation based on similarities and differences in their purchase criteria for that innovation with predictable differences in the pattern of adoption of an innovation across segments.

We have used this framework to identify ‘market segments’ for innovations in a range of industries. Differences in the pattern of adoption of innovations across segments were in line with expectations. We draw a number of implications for research and extension from our results.
Introduction

Current extension theory and practice in Australia seeks to promote the adoption of agricultural innovations by facilitating the personal development of farmers, especially with respect to learning. However, efforts to create a culture of innovation and continuous learning do not seem to have translated into the higher adoption rates that many had hoped for. We believe other paradigms, such as consumer behaviour theory, may offer insights on this issue.

Purpose

Our purpose in this paper is to explore the potential of consumer behaviour theory as a model of adoption behaviour in agriculture. In doing so we hope to highlight the potential links that might exist between market research, in the form of consumer behaviour theory, and extension theory as it currently stands in Australia.

Theoretical Framework

Consumer behaviour theory posits that, in situations that matter to the consumer, the consumer is a motivated and discriminating purchaser. The motivated consumer is portrayed as actively seeking information and systematically learning about the product. Failure to purchase is generally attributed to a mismatch between consumer needs and the benefits the product offers.

A key factor in consumer purchase decisions is the level of consumer involvement in the product. Involvement falls along a continuum and is multi-dimensional (Kapferer and Laurent 1985, 1986). Low involvement purchasing occurs with products that are unimportant to the consumer (Assael 1998, 68). Typically, these purchases are inexpensive, routinely purchased and involve little risk. The consumer is unlikely to devote much, if any, time and effort to careful consideration of alternatives before making a purchase.

High involvement purchasing occurs with products that are important to the consumer (Assael 1998, 68). High involvement purchasing usually entails risk of some kind - financial, social or psychological. High involvement products are often expensive, rarely or infrequently purchased and closely tied to self-image and ego. As a result, the consumer is likely to devote time and effort to careful consideration of alternatives before making a purchase.

We believe most decisions to adopt a new agricultural technology are a form of high involvement purchase for the following reasons. Adoption of new technology is likely to have serious consequences for the current and future financial potential of the farm enterprise. Also, integrating new technology into a farm context is often a difficult task because an array of factors needs to be considered. In short, the purchase of new technology often entails financial, social and psychological risks in that the outcomes can affect the economic and social wellbeing of family members and influence a farmer’s feelings of achievement and self-fulfilment.

Consumer behaviour theory suggests that consumers follow a complex decision-making process with high involvement purchases (Assael 1998, 68). Note that, complex decision making is facilitated when there is adequate time for extensive information search and processing (Beatty and Smith 1987), adequate information is available on product characteristics and the consumer has the ability to process the available information (Greenleaf and Lehmann 1995). Complex decision-making is a systematic, often iterative
process in which the consumer learns about the attributes of products and develops a set of purchase criteria for choosing the most suitable product. These benefit or purchase criteria represent the key benefits sought by the consumer and generally reflect their usage situation (Assael 1998, 81). For example, economy, dependability and safety are key purchase criteria for many consumers with families that are buying motor vehicles that will be used daily to transport family members, especially children. Having settled on a set of purchase criteria for deciding between products, the consumer then evaluates the products against the criteria and makes a choice.

Consumers from different usage situations will employ different purchase criteria to evaluate products while consumers from similar situations will employ similar criteria. Information on the similarities and differences in the key purchase criteria used by consumers can be used to classify consumers into market segments (Assael 1998, 81). This information can also be used to develop and promote a suite of products with characteristics that are tailored to provide the benefits sought by consumers in each particular segment.

In farming, the usage situation is most likely to be a function of the farm context into which a new agricultural practice must be integrated (Crouch 1981, Kaine and Lees 1994). The farm context is the mix of practices and techniques used on the farm, and the resources available to the farm business, that influence the benefits and costs of adopting an innovation (Kaine and Lees 1994). Often, the advantages of a new agricultural practice can only be fully captured when that practice is used in conjunction with some particular farming context. Consequently, the value of a new practice will vary between producers depending on their farming context (Kaine and Lees 1994, 2). In other words, if an innovation can only be successfully applied in particular farm contexts, then the value and relevance of that innovation will vary across contexts. This means the pattern of adoption of innovations will vary from innovation to innovation depending on the range of farm contexts within which each innovation can be successfully implemented (Kaine and Lees 1994, 3).

The corollary for agriculture is that differences in farm context lead to differences between producers in the benefits and costs of adopting an innovation and the criteria to be used in evaluating new agricultural practices (Kaine and Lees 1994). Consequently, information on similarities and differences in farm contexts can be used to classify producers into market segments with respect to a particular innovation. In principle, this information can also be used to develop and promote versions of an innovation with characteristics that are tailored to provide the benefits sought by the producers in each particular segment.

We have identified ‘market segments’ for irrigation technologies in the dairy, horticulture and viticulture industries. We have also used this framework to identify segments for the adoption of quantitative breeding techniques in the Australian sheep industry and to identify segments in dryland dairy farming for techniques to manage waterlogged soils.

Results and Conclusions

A number of implications arise from treating the adoption of agricultural innovations as a form of high involvement purchasing. One implication is that farmers can be classified into ‘market segments’ for an innovation based on similarities and differences in usage situations with the rate of adoption of the innovation varying in a predictable pattern across usage situations. This is illustrated by a recent study into the adoption of sub-surface drainage by dryland dairy farms in southeast Australia (Kaine and Niall 1999).
Waterlogging occurs through winter and spring on dryland dairy farms in southeast Australia and can be alleviated by installing sub-surface drainage. The conventional wisdom among research and extension staff was that farmers were not adopting sub-surface drainage because they were under-estimating production losses due to waterlogging. From interviews with farmers we found that the key purchase criteria influencing adoption of sub-surface drainage was the severity of waterlogging in spring (Kaine and Niall 1999). Severe waterlogging in spring dramatically reduces pasture growth and production (of the order of 30 per cent) thereby making the investment in sub-surface drainage worthwhile. Using survey data we classified over 900 dairy farmers into six market segments depending on the severity of waterlogging they experienced during winter and spring (Kaine and Niall 1999). We found significant differences in the adoption of sub-surface drainage across the segments and these differences were consistent with expectations (Kaine and Niall 1999).

For instance, who experienced waterlogging during winter and spring were classified into three segments depending on the severity of waterlogging in spring with farmers in segment one most affected and farmers in segment three affected least. Approximately 26 per cent, 20 per cent and 17 per cent of farmers had installed sub-surface drainage in these segments respectively (Kaine and Niall 1999). Given that approximately 70 per cent of the farmers in each of these three segments were prevented from installing sub-surface drainage by the topography or soils on their properties these results suggest that the adoption of sub-surface drainage in these segments is, in fact, extremely high. These results also suggest that topography and soils are the major barriers to the adoption of sub-surface drainage.

Farmers in segments four and five only experienced waterlogging during winter while farmers in segment six rarely experienced waterlogging for an extended period of time at all (Kaine and Niall 1999). Hence, the minor production losses these farmers experienced were not usually sufficient to warrant investing in sub-surface drainage. Farmers in these segments were more likely to adopt less expensive alternatives to drainage such as feed-pads and grazing strategies. We found 13 per cent, 11 per cent and 6 per cent of farmers in these segments respectively had installed drainage (Kaine and Niall 1999).

Another implication of treating the adoption of agricultural innovations as a form of high involvement purchasing is that different innovations necessarily invoke different sets of usage situations and therefore different purchase criteria. This means farmers’ membership of adopter categories maybe innovation dependent and that different farmers may well adopt an innovation for quite different reasons.

For example we are currently undertaking a study into the adoption of irrigation technologies in the vegetable industry (Bewsell and Kaine 2002). Many growers in the vegetable industry were characterised as ‘laggards’ because they continued to rely on furrow irrigation instead of switching to micro-irrigation. Failure to adopt was attributed, at least partly, to insufficient knowledge of micro-irrigation systems and their management. We found that most vegetable growers also produced other crops such as grapes. These growers were using micro-irrigation on their grapes but continued to use furrow irrigation on their vegetables. Apparently, these growers were simultaneously ‘innovators’ and ‘laggards’.

Clearly, insufficient knowledge of micro-irrigation systems and their management did not explain growers’ use of furrow irrigation on vegetables. The growers explained that a five-year rotation was needed with vegetables to avoid severe problems with soil borne diseases in heavy soils. The cost of installing micro-irrigation to produce a crop for only one season was prohibitive. In contrast, micro-irrigation provided growers with the ability to fine
tune irrigation of their grapes so as to produce to quality specifications, thereby maximising income.

In short, differences in the production contexts for grape and vegetable production amounted to different usage situations for micro-irrigation. The perception that growers were ‘laggards’ in terms of adopting micro-irrigation technology was mistaken. Another implication of treating the adoption of agricultural innovations as a form of high involvement purchasing is that accelerating the adoption of an innovation may entail changing either the product itself or usage situations (or both). Generally, changing the usage situation involves policy change or addressing infrastructure issues.

Infrastructure is a key factor in, for example, the adoption of quantitative soil moisture monitoring the horticulture industry (Kaine and Bewsell 2000). The use of micro-irrigation in conjunction with soil moisture monitoring requires access to irrigation water on demand. In irrigation districts that rely on channel distribution systems water must be ordered up to three days in advance. The conversion of channel delivery systems to pressurised delivery systems that provide water on demand would facilitate the adoption of micro-irrigation and quantitative soil moisture monitoring in many districts.

In the case of waterlogging in the dairy industry described above our research highlighted the need to develop alternatives to sub-surface drainage for areas where the topography or soils were unsuited for existing sub-surface technologies such as mole drains or slotted pipes. Our research also highlighted a need for a greater variety in feed-pad designs. These needs are now the focus of a new research and extension program in the industry.

Educational Importance

The characterisation of adoption of agricultural practices as a form of high involvement purchasing which provokes complex decision making on the part of farmers raises some issues for extension.

In Australian extension there is a heavy emphasis on facilitating learning by farmers on the assumption that inadequate learning skills are a major obstacle to the adoption of new agricultural ideas (Kenny and Paine 2001). However, the consumer behaviour model suggests low rates of adoption of many innovations may reflect the incompatibility of these innovations with some agricultural usage situations.

The incompatibility of many innovations with some agricultural usage situations suggests that market research has a role to play in conjunction with extension professionals in informing researchers about farmers’ needs (Teixeira, Chamala and Cowan 2001).

The presence of different usage situations for an innovation suggests that different research and extension strategies may be needed that are designed and targeted to meet the needs of farmers in different situations. While the need for targeting has been recognised previously this recognition has usually occurred at a highly generalised level such as farming styles (Thompson 2001).

The presence of different usage situations also suggests that the evaluation of research and extension activities should account for different rates of interest and adoption across situations.
References


Kaine, G. and Bewsell, D. (2000). *Soil Monitoring, Irrigation Scheduling and Fruit Production (Parts One, and Two)* Reports to the Victorian Department of Natural Resources and Environment, School of Marketing and Management, UNE, Armidale.


