

An analysis of the learning styles preferences of UK farmers, growers and industry stakeholders

Abstract

The Agriculture and Horticulture Development Board (AHDB) undertakes activities in support of UK farmers and growers (collectively producers) that a single producer could not undertake themselves. This work often involves the uptake of 'best practice' involving either a technological or process innovation. The change in practice equates to a change in behaviour, i.e. I did not undertake this practice before, and now I do. To understand the producer as a customer, work was undertaken using Honey and Mumford's (1982) learning styles assessment to analyse how UK producers prefer to access learning that supports behaviour change. The outcome demonstrated that UK producers are most likely (69%) to show strong preferences for a theorist style of learning and least likely (22%) to show a strong preference for an activist style of learning. The output of the analysis is to assess the implication for engaging UK producers in effective learning that supports behaviour change beneficial to the producer and the wider UK agriculture and horticulture sectors.

Introduction

Learning styles or preferences have been suggested by multiple scholars. These include the VARK (Fleming, 1995) based on neuro-linguistic programming (NLP). NLP categorises into a specific modality which are separate heterogeneous groups. While some multi-modality exists, the modes themselves are seen as separate and distinct, like boxes. The VARK learning styles suggest that individuals have one overall learning preference which better suits their style. The learning style suggests an increase in effective learning if the learner has access to materials and experiences better suited to their style (see Figure 1). Where there are those with multiple modalities, preference will depend on the task to be learnt and learners adaptability.

Kolb (1976), Honey & Mumford (1982) and Gregorc (1979) all developed learning styles based on Jungian principles, dichotomies on an axis of behaviours that describe the position people enter a learning cycle. These learning preferences differ from VARK in that they describe an initial preference but also indicate the next stage in the learning cycle an individual would have to engage with if they were to be considered an effective learner. By proxy, those preferences an individual least identifies as preferences can indicate barriers to learning, i.e. those preferences that they do not wish to engage with and as such would prevent effective learning. While each learning cycle has critics, and there are complexities around the fluidity of peoples preferences (fixed for life vs



Figure 1. Description of VARK learning styles adapted from Fleming (1995)

flexible), all have been well received across multiple fields of education and management. There is a suggestion that people like to be placed in a box (McCaulley, 2000). This identification of how an individual prefers to view themselves and their engagement in education has a benefit. In any transaction, including that of knowledge, there are barriers to overcome, also referred to as transaction costs. The costs that the customer (learner) bears are just as important as those of the seller. They can be thought of in the same way as the activation energy (Arrhenius Law) of a chemical reaction. For a reaction or transaction to take place, there is effort or energy that needs to be expended in order to progress. In transactional terms, this is usually the use of behavioural motivators or nudge factors (Such as the RESET model described by Lam et al. 2019) to engage the

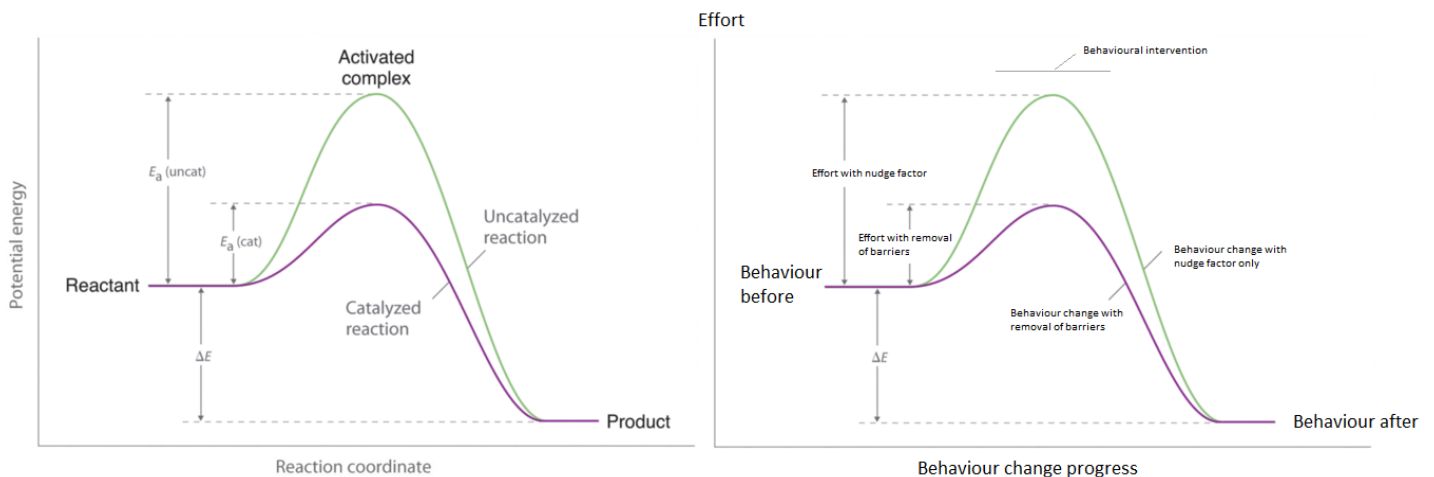


Figure 2. Arrhenius' Law as a comparison to reducing the barriers to behaviour change learner. In chemical terms, this is the application of energy such as heat. In both cases, this can be reduced by providing some form of catalyst. In behaviour and learning terms, this is a reduction of the customer's barriers, i.e. making the learning suited and engaging to them. This is where learning styles may add benefit (see Figure 2).

In short, the reduction of barriers to customers in conjunction with the successful application of nudge factors should increase the uptake of effective learning that results in behaviour change.

There has been little specific exploration of the learning styles of farmers and growers and even less so in the UK. Franz et al. (2010) identified US farmers in the state of Iowa preferred learning methods that were: hands-on (99%), demonstration (96%), farm visit (94%), field day (88%), discussion (87%), and one-on-one (85%). Farmers had mixed preferences for online-Web, newsletters, books/manuals, on-farm tests, meetings, and lectures. Finally, four ways these farmers do not prefer to learn are games (80%), comics (78%), role-playing (77%), and radio (63 %). While Franz et al. (2010) followed the methodology laid out by Bogden & Biklen (2003), it did not identify with a specific learning style as previously discussed. Instead, it asked sector-specific questions such as "How do you go about solving a problem on your farm?", "Do you prefer to learn alone or in groups and why?" and "How do you prefer to learn a new farming method or way of operating?"

Pittenger (2005) cautioned that learning style and personality type correlated strongly with culture, and as such, any parallels drawn between US farmers and UK farmers should be approached cautiously. This need to look at UK producers as their own cultural group resulted in AHDB undertaking research with Qa research to assess from a sample of producers and stakeholders, their preferred learning styles.

Methodology

AHDB opted to use the Honey & Mumford learning preferences assessment (40 questions version) listed freely at aluminati.net to assess 403 producers (n303) and stakeholders (n100) who use AHDBs services, tools and materials. The specific questions and the assessment matrix can be viewed in Appendix 1. Minimum quotas were assigned to subgroups to minimise bias from certain agricultural sectors and/or stakeholder groups (see Table 1).

Table 1. Summary of achieved survey sample

AHDB Sector or Group	Achieved sample <i>n</i>	Achieved sample %
Farmers/Growers		
Beef & Lamb	50	16.5%
Cereals and Oilseeds	53	17.5%
Dairy	50	16.5%
Horticulture	50	16.5%
Pork	50	16.5%
Potatoes	50	16.5%
Total	303	100%
Stakeholders		
Agronomists	27	27%
Vets	20	20%
Research/Trials	15	15%
Other	38	38%
Total	100	100%

The contacts were taken from AHDB's customer relationship management (CRM) system, with the bulk of respondents contacted after they indicated a willingness for follow-up contact following AHDB's levy payer satisfaction survey (LPSS). Pork respondents represented a small subset of the LPSS contact list, and these were supplemented by contacts provided by the pork AHDB field team. The stakeholders pulled from a sample of AHDB's CRM records with contacts clearly defined as not levy payers (not primary producers) and with at least two contact numbers selected. In total, a range of stakeholders were identified with other (n38) containing roles such as geneticist, sales and technical managers and nutritionists. These roles could be considered as technical influencers supplying information to the UK agriculture and horticulture industry.

A telephone survey was undertaken by Qa Research which started with an stating, "We [Qa Research] have been commissioned by AHDB, the Agriculture and Horticulture Development Board, to carry out a survey with farmer/grower levy payers/industry stakeholders.

"The survey will help to identify your learning preferences, and the findings will help AHDB to understand how users of their resources would prefer to view or access such information in the future." This was the only context provided. No further alteration of the methodology from that shown in Appendix 1 was made to account for sector or industry nuances. This conscious decision was taken so as not to bias or influence the questions by providing further context. It also ensured repeatability as the questions are standardised.

Following demographic questions (age, gender and sector/stakeholder type), each interviewee was asked to provide an agree or disagree statement to each of the 40 statements (10 per learning style). These responses were plotted against the matrix provided in Appendix 1 to provide a weighting of preference to each learning style.

Analysis

Table 2. Attributes and learning activities favoured by each learning style, adapted from Honey & Mumford (1982)

Learning Style	Attributes	Activities
Activist	• Learn by doing, and happy to jump in • Enjoy the challenge of new experiences, without bias • Often guilty of acting before they think • Do not learn well from teaching, theory, reading or analysing data	• Puzzles • Competitions • Role-play • Brainstorming • Problem-solving
Theorist	• Like to understand the theory behind actions • Enjoy models, concepts and facts • Analyse and synthesise testable hypotheses • Not suited to learning without instruction • Not good in situations that involve 'feelings' or when objectives or instructions are ambiguous	• Models • Statistics • Stories • Quotes • Applying theories
Pragmatist	• Need to be able to see how they apply their learning to the real world • Abstract concepts are useless if they cannot see how it is applicable • Enjoy trying new theories and techniques • Do not happily engage when objectives and instructions are unclear, or when it is heavy in theory	• Thinking about how to apply theories to reality • Case studies • Problem-solving • Discussion
Reflector	• Learn through observation and reflecting on results • Prefer to watch from the side-lines • Take information in from multiple perspectives and work to a conclusion • Reflectors are not good at leading activities or being rushed, with no preparation	• Observing activities • Feedback from others • Coaching • Interviews • Paired discussions

The overall learning style preferences (see Table 2) for producers is shown in Figure 3. It shows that overall, UK producers (n303) tend to have a bias towards a strong preference for the theorist learning style (69%) while having the least strong preference for the activist style of learning (22%).

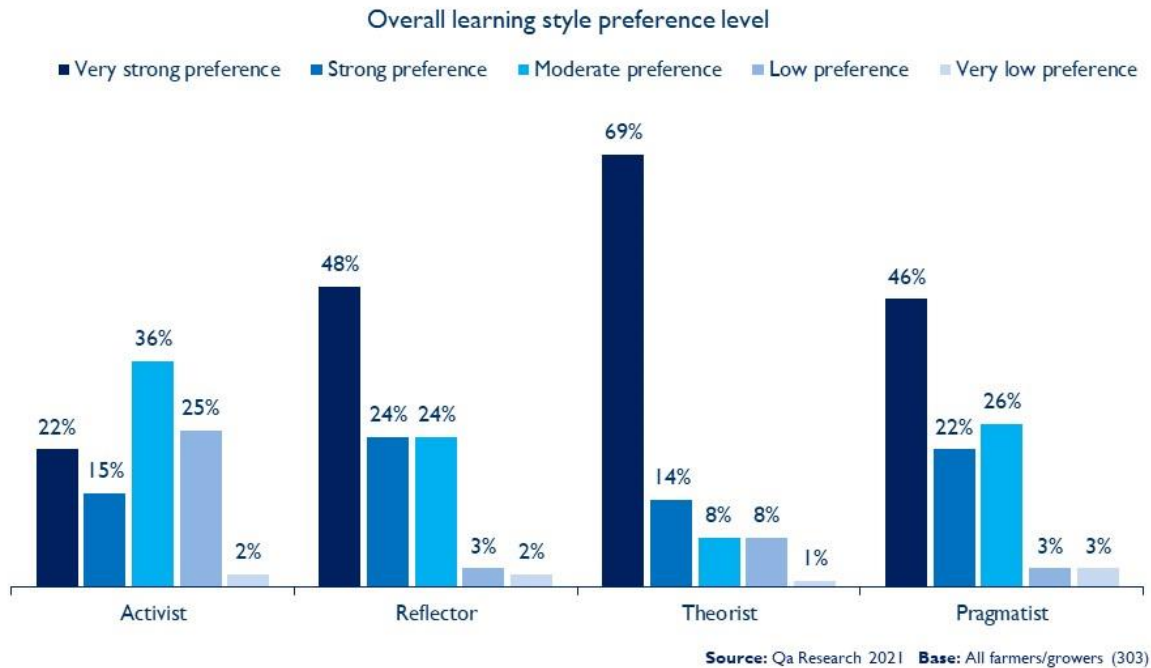


Figure 3. Overall learning style preference for UK producers (all sectors) from survey data supplied by Qa Research as commissioned by AHDB

Reflectors and pragmatists are closely matched in terms of overall preference and show that generally, UK producers are more likely to engage with the learning process as theorists and struggle with any activities that require an activist style.

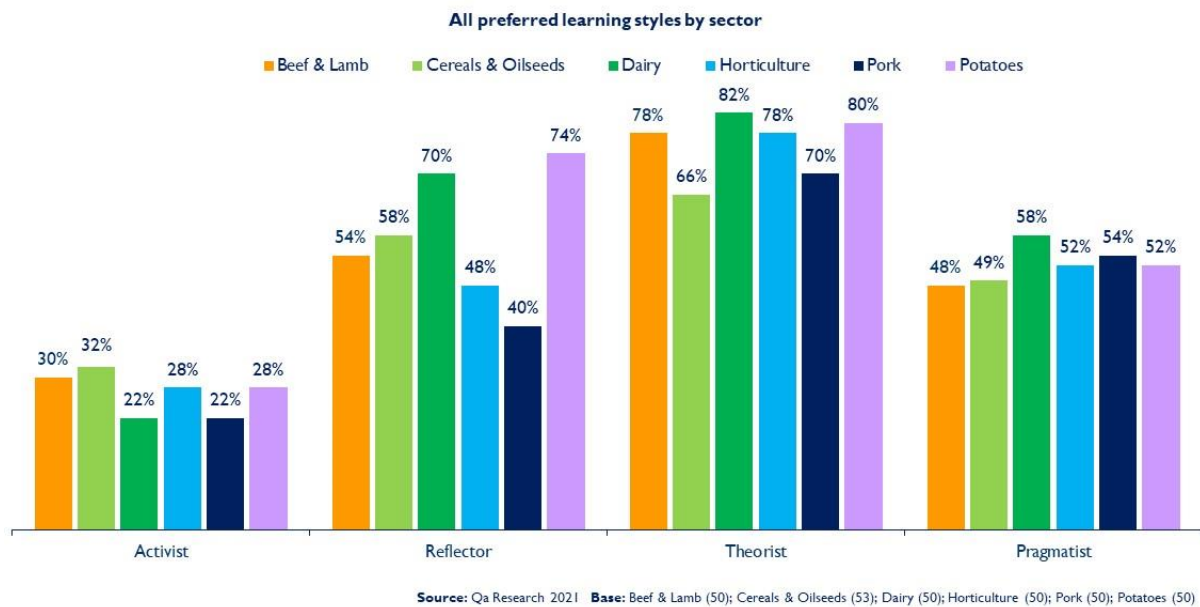


Figure 4. Learning style preference for UK producers by sector from survey data supplied by Qa Research as commissioned by AHDB

There was some difference by sector (Figure 4), with each having its quirks, suggesting that each sector has subtle variations in how they engage with learning. While all of those sampled tended to favour a theorist approach, the Potato and Dairy sectors have strong preferences for reflector styles, whereas not so for pork producers. Figure 5 shows that most producers are multimodal, having more than one preferred learning style. Some sectors had no producers stating that they had a strong preference for a learning style in specific sectors, e.g. Beef & Lamb did not have any producers with a single pragmatist style and Dairy had no activists as strong style preference.

A further analysis (Figure 6) shows that most learning preferences can be explained by one or two

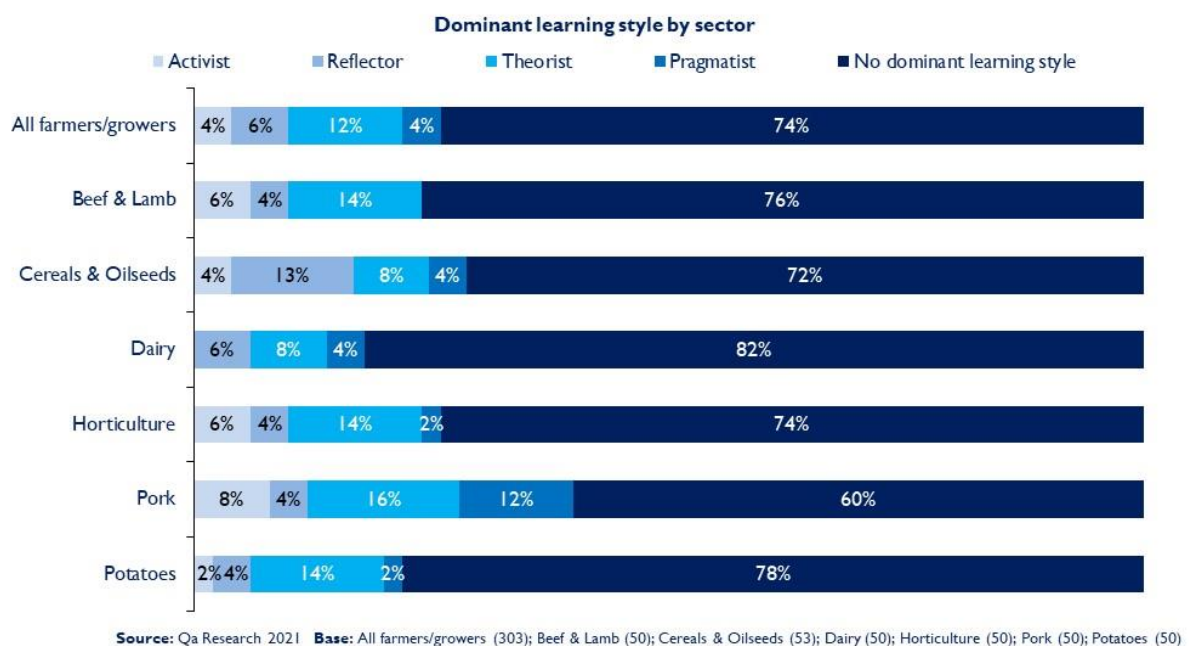


Figure 5. Distribution of dominant learning styles by sector

learning styles, the exception being potato growers. It may seem like potato growers are extremely flexible in their learning preferences, but it may suggest they are highly variable, i.e. the style they prefer will be dependent on a number of factors such as topic, peers and location. Also of interest in Figure 6 are pork producers who have a substantially higher number of producers with a clearly dominant single learning preference (40% of those sampled). Potatoes are often grown in addition to other crops in rotations and or livestock enterprises. Further research would have to be undertaken due, to the small sample size and limitations of the questions, to see if being part of multiple enterprises, specifically in potatoes, contributed to the multimodal preferences identified in potato growers. Pork as a sector is highly specialised and often part of larger integrated supply chain operations. Again, further work would need to be undertaken to see if the nature of the industry itself had any bearing on the dominance of specific styles.

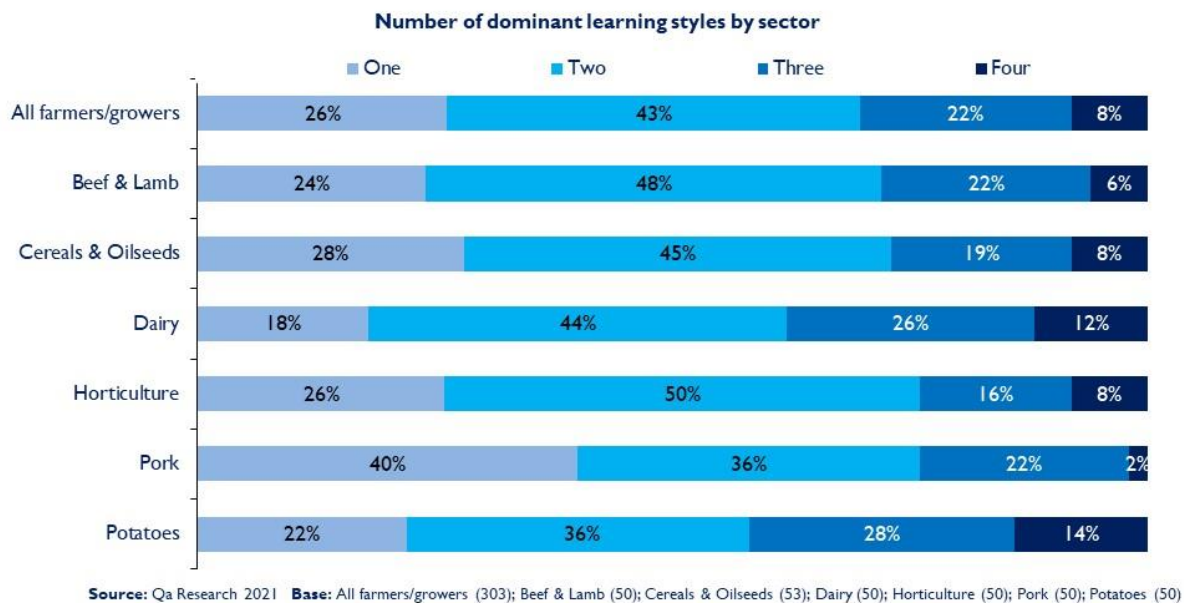


Figure 6. Number of dominant learning styles be sector

Using the LPSS data, Qa Research cross-referenced respondents against those who indicated operations in multiple agricultural and horticultural sectors (Figure 7). It shows that there is a slight tendency in producers with a single enterprise to be less multimodal (the opposite of what the potato sector shows). This raises further questions regarding whether the industry, enterprise, and degree of specialisation impacts learning preferences, i.e. do those who have to work across multiple enterprises tend to be more multimodal? The answer appears as a whole sample to be no, but with exceptions such as potato growers.

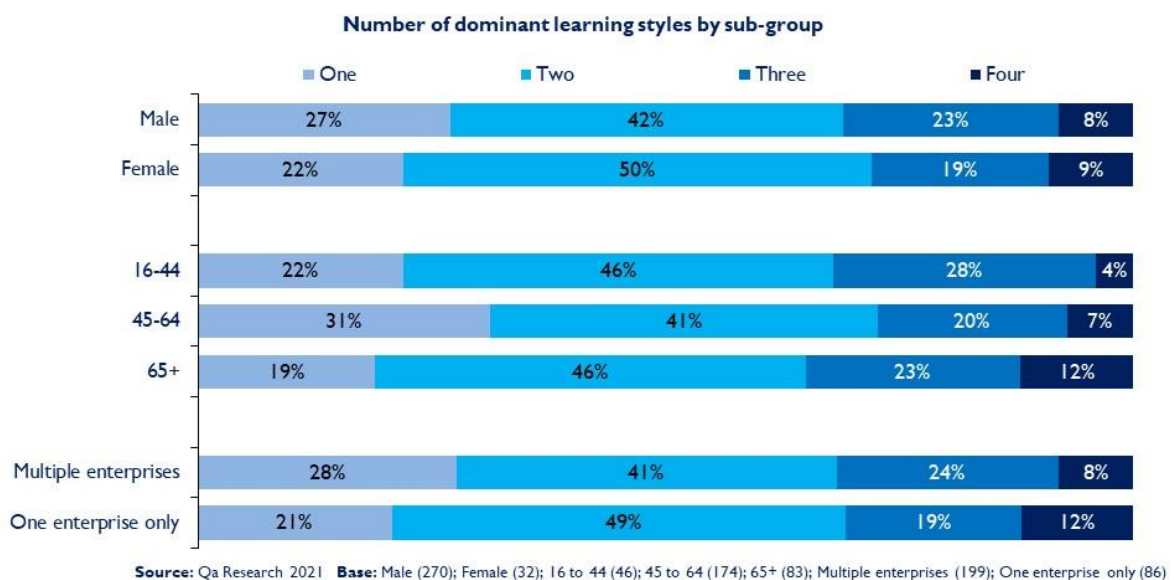


Figure 7. Number of dominant learning styles by sub-group

Figure 7 also analyses differences by age and gender. Females as a representative sample are too small to be statistically significant and, currently, the difference between males and females seems negligible. To truly assess if there is a learning preference, further sampling of females would be required. This would need to be undertaken in conjunction with a customer audit as there may be

assumptions from other samples such as LPSS, whereby males dominate the respondents that our audience is male dominated. There is no specific evidence for such a statement and AHDB would be at risk of marginalising a substantial customer base (females in agriculture) if it failed to assess their needs sufficiently.

Using age groups to show change over time is limited again, as the subgroups at either end are small (n46 and n83), representing a bias in our sample data. Those aged 45–64 tend to communicate the farm’s direction in surveys such as LPSS. This means using the LPSS contacts as a base does risk some bias that could be offset by expanding the higher and lower demographic age groups sampled. This could be done in conjunction with tertiary education facilities, which could also use the learning styles assessments to their own advantage.

Analysis of the stakeholder groups (Figure 8) showed that their learning preference mirrored the industry they serve, support and influence. Theorists (57%) as a preference dominated with a close grouping of Reflector (39%) and Pragmatist (37%) with Activist (18%) considered the least preferred learning style.

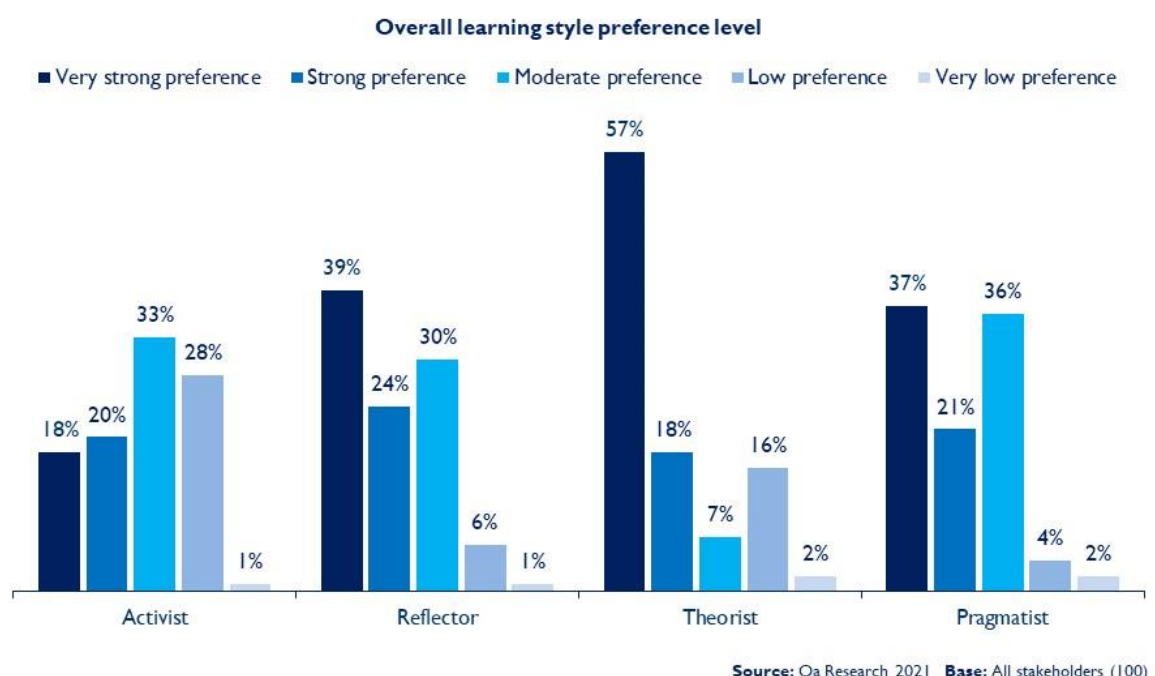


Figure 8. Overall learning style preference for UK agriculture and horticulture stakeholders (all categories) from survey data supplied by Qa research as commissioned by AHDB

There were substantial differences between categories of stakeholders, with both agronomists and vets showing interesting trends despite the sample sizes being too small to be significant (n27 and n20, respectively). Figure 9 shows that while agronomists tended to be more prone to being multimodal, vets showed a strong preference compared with not only the other stakeholders but also the industry they serve for an activist learning style.

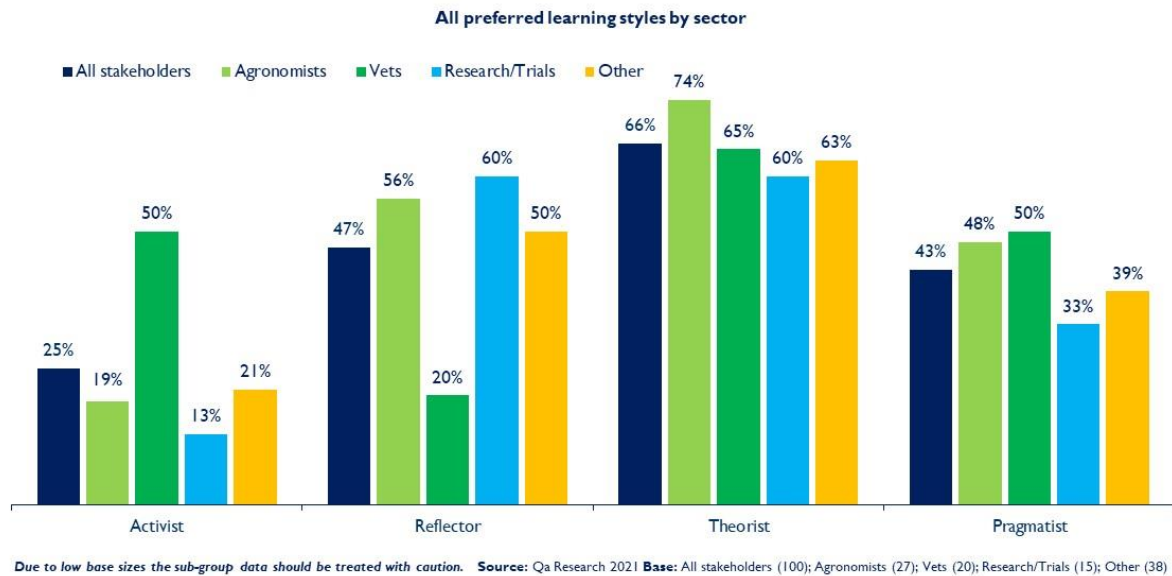


Figure 9. Overall learning style preference for UK agriculture and horticulture stakeholders by category from survey data supplied by Qa Research as commissioned by AHDB

In addition to being more likely to identify as an activist, vets are less likely to identify as reflectors. Given the small sample size (n20), it would be of interest to see if this trend holds true across a much larger sample. If it does, it could explain why vets are so intrinsic to on-farm processes as their strength in the activist learning activities fills the gap in terms of the producer's least favourite style.

Stakeholders are more likely to be biased to a single overall learning style, suggesting that when looking for ways of engaging stakeholders with learning, the process should be more targeted and straightforward. Agronomists buck this trend, as can be seen in Figure 10, with a much more multimodal approach.

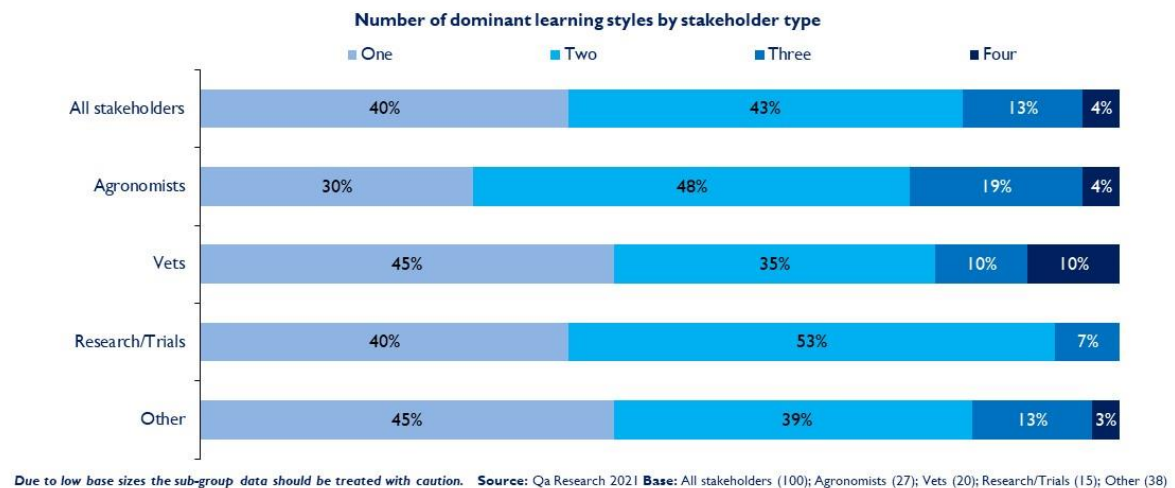


Figure 10. Number of dominant learning styles by stakeholder category (type)

Conclusion

Honey & Mumford (1982) described effective learning as:

- Learning that sticks for as long as it is useful

- Learning that is used appropriately to the situation
- Learning that makes a difference for the better

The acquisition of effective learning is described as a process or cycle adapted from Kolb's learning process (Kolb, 1976). Figure 11 shows the learning cycle adapted from Kolb (1976) and the point at which learners would enter the cyclical learning process based on their overall preference.

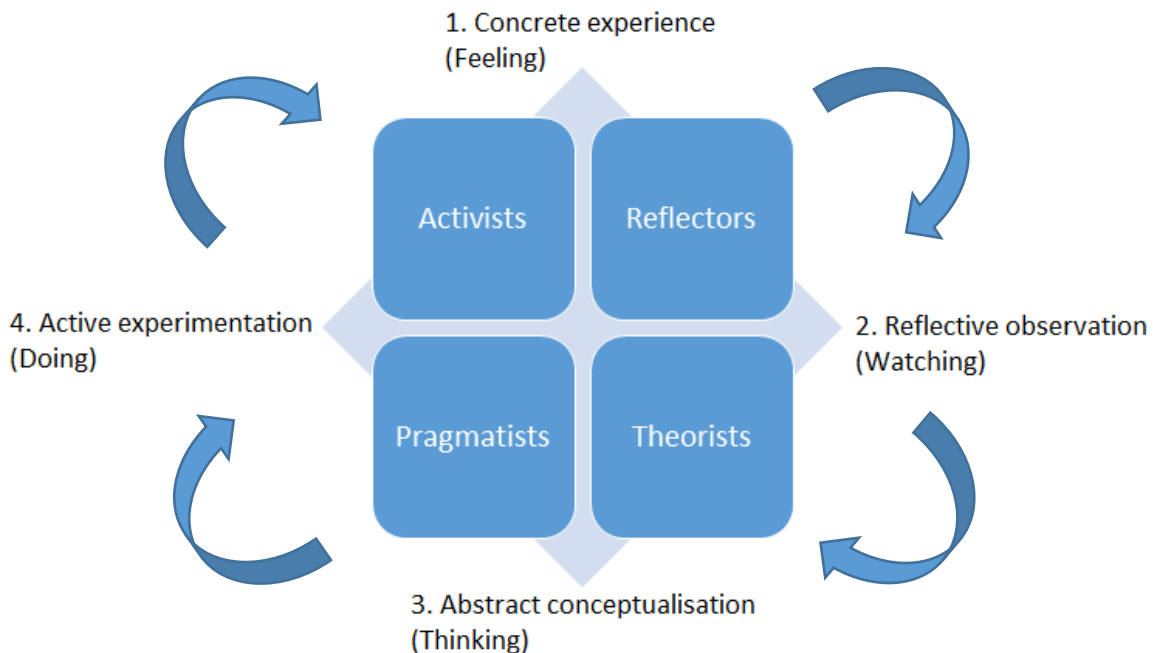


Figure 11. Learning cycle adapted from Kolb (1976)

The analysis suggests that most of AHDB's target audience, be that producers or stakeholders have a strong preference for the theorist learning style. This means they would prefer to enter the learning cycle as thinkers before moving to doing and making use of those pragmatist activities to support that learning. While the survey data shows that 46% of producers and 37% of stakeholders identify with a strong preference for pragmatist learning styles, there is a risk that many do not. This highlights two points of consideration for AHDB:

1. Users entering learning as theorists need support and well-constructed user journeys to support them moving from theorists which they prefer to pragmatists, which is less preferred.
2. Attempts to engage producers and stakeholders directly with pragmatist (or other activity types) is likely to be less effective than starting with theorist activities (see Table 1).

Kolb (1976) and Honey & Mumford (1982) both stated for learning to be considered truly effective the full cycle had to be completed by individual learners. From the analysis of AHDB's survey data, there is a clear barrier to effective learning from stakeholders who do not identify with the activist style of learning. AHDB has several options, including:

- Making use of stakeholders who do identify with the activist learning style to support producers as effective learners
- Developing more appropriate and sector/industry-specific activist resources which further increase relevance

- Ensuring that activist activities are part of a clear user journey that makes use of learner learning preferences as a scaffold or golden thread through the entire cycle, e.g. bring theorist activities into the activist elements of learning
- Supporting AHDB's field teams to facilitate activist activities in a format more suited to the UK producers it serves

It is likely that depending on the programme of activity, learning, setting and topic that a combination of all of these suggestions will need to be explored. Honey & Mumford (1982) describe the overall process of using learning styles to change effective behaviour as a process made up of three clear stages:

1. Identify the behaviours you want.
2. Describe what you will do to trigger the behaviour.
3. Describe what you will do to reinforce the behaviour.

Figure 12 integrates the learning preferences and learning cycle alongside the use of the Campaign strategy instrument (CASI) described by Lam et al. (2019) as a model for engaging UK producers in behaviour change. The end goal is to reduce the effort taken for behaviour change to occur within a target audience (Figure 2).

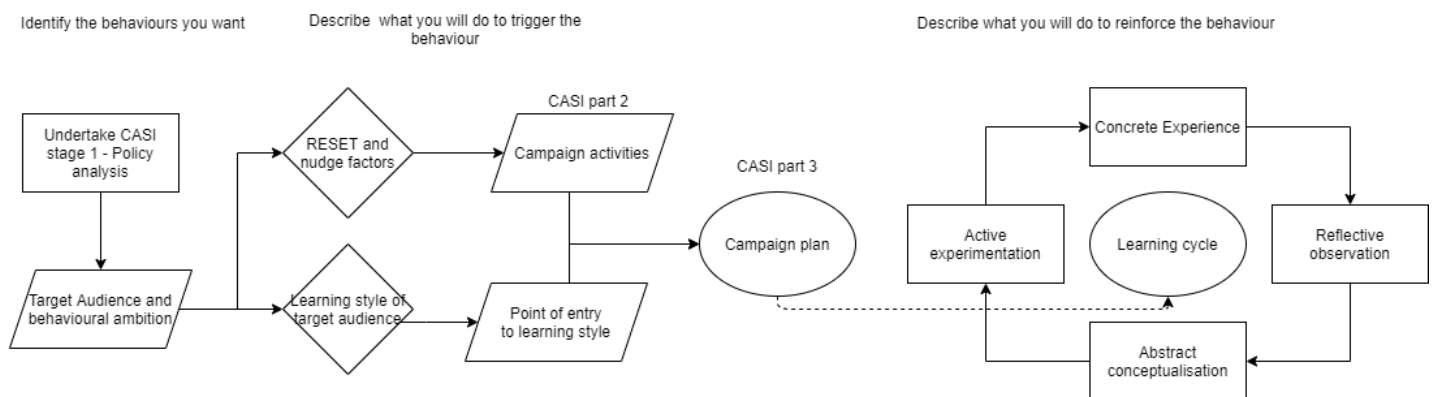


Figure 12. Process map showing the integration of behavioural insights, learning styles and the learning cycle into a successful campaign delivery model (rectangles = processes, parallelograms = outputs/inputs, diamonds = decisions based on output/input data, ovals = overall processes)

Figure 12 describes the use of behavioural insight methodologies to describe which activities are most likely to get over the barriers of behavioural change, as well as using the preferred learning style as a catalyst to reduce those barriers. This information forms the campaign plan, i.e. the types of activities (linked to learning styles) that will need to be undertaken to change behaviour. This plan is then mapped across the learning cycle identifying which of the activities is most likely to require additional resources and use of third parties or stakeholders to support the learning cycle based on the target audience.

Recommended actions for AHDB:

- Assess how the process described in Figure 12 can be implemented as part of the operational delivery
- Based on these findings, identify the training needs of those staff with operational responsibility for delivering this aspect of AHDB's output

- Use the process and trained staff to identify current and future work streams against the learning cycle. Map those 'crown jewel' elements of current work and identify gaps based on the need to create user journeys that follow the learning cycle
- Deliver carefully sequenced user journeys playing to clearly specified target audience's needs

The need to ensure sufficient activity to undertake the full learning cycle has implications for staff capacity (a more comprehensive programme of work requires fewer total programmes to minimise the risk of working beyond staff capacity), budgeting in terms of both amounts allocated to work and timeframes for budgeting.

True zero-based budgeting would need to cost all activities across the full programme learning cycle. It also has implications for staff mindset and skillset, the provision of skills and training to engage producers with varied learning styles across the full learning cycle will be vital to the success of any programmes at AHDB.

It is through the same provision of skills opportunities that should be taken to support mindset change through examples of what works. Those programmes that have successfully used the programme elements described in Figure 12 to deliver behaviour change and effective learning.

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Appendix 1

1	I often take reasonable risks if they're justified.	
2	I tend to solve problems using a step by step approach, avoiding fanciful ideas.	
3	I tend to have a 'no-nonsense' direct style.	
4	I often find that actions based on feelings are as sound as those based on thoughts and analysis.	
5	The key factor in judging proposed ideas or solutions is whether they work in practice or not.	
6	When I hear about a new idea or approach, I like to start working out how to apply it in practice as soon as possible.	
7	I like to follow a self-disciplined approach, with clear routines and logical thinking patterns.	
8	I take pride in doing a thorough, methodical job.	
9	I get on best with logical, analytical people and less well with spontaneous 'irrational' people.	
10	I take care over the interpretation of data available to me and avoid jumping to conclusions.	
11	I like to reach a decision carefully, after weighing up many alternatives.	
12	I'm attracted more to new, unusual ideas than to practical ones.	
13	I dislike situations that I can't fit into a pattern.	
14	I like to relate my actions to general principles.	
15	In meetings, I tend to go straight to the point.	
16	I prefer to have as many sources of information as possible – the more, the better.	
17	People who don't take things seriously enough irritate me.	
18	I prefer to respond to events on a spontaneous, flexible basis, rather than planning things out.	

19	I dislike tight deadlines – I need more time to think.	
20	I judge people's ideas on their practical merits.	
21	I get irritated by people who rush into things.	
22	The present is more important than the past or the future.	
23	I think decisions based on thorough analysis are sounder than those based on intuition.	
24	I enjoy contributing ideas just as they occur to me.	
25	On balance, I tend to talk more than I should.	
26	In meetings, I get impatient when people lose sight of the objective.	
27	I like telling others my ideas and opinions.	
28	People in meetings should be realistic, keep to the point and avoid indulging in fancy ideas.	
29	I like to ponder alternatives before deciding.	
30	In meetings, I think I am objective and unemotional.	
31	At meetings, I'm more likely to keep in the background rather than taking the lead.	
32	On balance, I prefer listening to talking.	
33	Usually, I think the ends justify the means.	
34	Group objectives and targets should take precedence over individual feelings and objections.	
35	I do whatever is needed to get the job done.	
36	I get bored with detailed, methodical work.	
37	I like exploring underlying theories and principles.	
38	I like methodical meetings, sticking to the agenda.	
39	I steer clear of subjective/ambiguous topics.	
40	I enjoy the drama/excitement of a crisis.	

Record where you placed the ticks on the questionnaire

1	4	12	18	22	24	25	27	36	40		Total Activist		X 2	
8	10	11	16	19	21	23	29	31	32		Total Reflector		X 2	
2	7	9	13	14	17	30	37	38	39		Total Theorist		X 2	
3	5	6	15	20	26	28	33	34	35		Total Pragmatist		X 2	

Learning style preferences

Circle the total in each column to identify your preferences

Activist	Reflector	Theorist	Pragmatist	Preferences
20	20	20	20	Very strong preference
19				
18		19		
17			19	
16	19	18		
15			18	
14		17		
13	18	16	17	Strong preference
12	17	15	16	
	16			
11	15	14	15	
10	14	13	14	
9	13	12	13	

8				Moderate preference
7	12	11	12	
6	11	10	11	Low preference
5	10	9	10	
4	9	8	9	
3	8	7	8	Very low preference
	7	6	7	
	6	5	6	
2	5	4	5	
	4		4	
1	3	3	3	
	2	2	2	
	1	1	1	
0	0	0	0	