Symposium Technical Session IV: Agribusiness Capacity Building and Public Awareness

Title: Agribusiness curriculum development for improved future intellectual capital

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**Abstract:** With global agribusiness being challenged and shaped by unprecedented issues, the building of future intellectual capital in the agrifood sector has never been more important. Climate change, heightened expectations of animal welfare, under-nutrition and over-nutrition of populations, consolidation of agrifood supply chains for cost reduction and resilience, consumer expectations of food provenance, searches for alternative protein sources and the adoption of digital technology throughout the agrifood chain are all issues that have crept onto the agribusiness agenda in last 15-20 years. Agribusiness can be defined as the amplification of raw food onto global markets and has a strong, combined pedigree from the disciplines of agricultural economics, agricultural science, sociology and political science. These roots of agribusiness have provided a robust foundation for its future development but agribusiness curricula must also look forward to future events, rather than back at theoretical principles, so that future intellectual capital is prepared to manage changes that we may not even know exist at present. This paper presents a case for evidence-based curriculum development that aligns the needs of industry with the preparation of students to graduate from universities as resilient, contributors to our global society.

**The problem:** Innovative vocational education has recognised the need to pair theoretical knowledge with industry knowledge to prepare graduates for future employment that is characterised as dynamic and uncertain (Jackson et al., 2016; Jackson & Hauser, 2016). For example, with increased global livestock numbers and heightened demand for safe and nutritious animal-based proteins, the European veterinary medical sector identified the need to add animal health economics to its curricula. The basis of this was to provide students with deep knowledge of the impacts of livestock disease, not only on animal welfare, but on the costs to society too (Jackson et al., 2016). Similarly, Jackson and Hauser (2016) conducted an investigation into the development of an evidence-based business component of veterinary medical curricula. The justification for this research was that veterinary business education had been lacking in the past and, with the commercialisation of veterinary services in the UK, graduates needed a background in commerce to provide them with a competitive advantage when in practice. These two pieces of research will underpin this paper.

**The approach & findings:** The research by Jackson et al. (2016) and Jackson and Hauser (2016) aimed for similar outcomes but took different approaches to developing evidence-based curricula. The pan-European recognition of the need for consistent education in animal health economics called for a large-scale survey of practitioners and academics associated with the European-funded NEAT project (see <http://www.neat-network.eu/>): Networking to enhance the use of economics in animal health education, research and policy-making in Europe and beyond. Online surveys were sent to 646 European contacts in three targeted groups: 1) educational institutions 2) non-educational private organisations including e.g. industry bodies (farm and food organisations), producers, service providers, consulting agencies and supply chain associations and 3) included public bodies like government agencies and research institutes. The final sample was 236 responses. It was first identified that any current animal health economics education varied widely across Europe and there was a strong desire for a common curriculum to be developed. Following this, findings suggested new and more up-to-date issues to be included in new curricula; as outlined in Table 1.

Table 1: A summary of existing and new topics animal health economics for new curriculum development

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| **Existing topics taught across Europe** | **New topics to emerge from the research** |
| * Introduction to economics, basic concepts * Accounting, finance * Firm-level economics, production and costs functions, profit maximisation, supply decisions * Demand theory, consumption, consumer preferences * Sector-level * economics, simultaneous analysis of demand and supply in one sector, * analysis which focuses on agriculture * Economics at the level of national economy, analysis covering other sectors in addition * to agriculture * Economics of public policies and public interventions, decision-making of public bodies * International trade * Practical examples on how to apply economics in animal health issues * Analytical derivation of economic results | Micro-level issues:   * Production costs (including all inputs, outputs), profit maximisation * Economic impacts of animal disease * Accountancy, finance * Pricing, marketing related to food, feed and veterinary services * Investment analysis |
| Macro-level issues:   * Economic impacts of animal disease * Market or sector analysis * Market price analysis (price trends, price formation) * Supply chain analysis, supply chain management * Consumer behaviour, demand analysis theory, consumption * Cost-effectiveness * analysis, cost–benefit analysis * Support to public or sector-level * decision making * Project or programme evaluation, policy analysis, policy impacts |

Source: Adapted from Jackson et al. (2016)

While the research into evidence-based animal health economics curricula took a far-reaching, confirmatory approach, the other work reported in this paper, on the development of an evidence-based veterinary business curriculum, took a narrower, exploratory approach. Over time, British veterinary medical curricula had been peppered with small quantities of business content, directives from the Royal College of Veterinary Surgeons, by way of its “Day One Competences”, required that undergraduates “Demonstrate knowledge of the organisation, management and legislation related to a veterinary business.” (RCVS, 2017, p. 4). There was also abundant literature to suggest that veterinary business curricula were needed, particularly from the USA (such as Bachynsky, et al., 2013; Brown and Silverman, 1999; Harris and Lloyd, 2011; Volk et al., 2011), but knowledge on exactly what to include in such curricula was missing. The novelty and narrow scope of the problem required an exploratory approach so, to determine industry-needs for a veterinary business curriculum, exploratory research was conducted to 1) understand the structure of the UK veterinary business environment and its main players and 2) develop a list of key skills for curriculum development.

Nineteen expert interviews were conducted in September – December, 2015. Participants were Members of the Royal College of Veterinary Surgeons (i.e. practicing veterinary surgeons) with expertise in small animal, farm animal and equine medicine while other segments of the industry were represented by consultants, practice managers, biotechnology start-up business, academics and the national Vet Futures strategy (see <https://www.vetfutures.org.uk/>). Participants’ experience in the UK veterinary profession ranged from five years to more than 30 years’ experience. Audio recordings transcribed verbatim and thematic analysis was conducted in NVivo 11.

Data revealed unanimous agreement that the structural nature of veterinary businesses in the UK is essential to include in the curriculum due to the inconsistent and incorrect use of terms within the profession. Parochial explanations of veterinary business structures in the UK were binomial: “corporate” or “independent”. Results suggested that this was no longer an adequate description of a rapidly-changing, complex commercial landscape. Rather, the business structures used by the HMRC were far more appropriate for students to understand the competitive nature of their industry: business limited by liability, joint venture, private equity groups and publicly limited company. In addition, six major themes emerged from the data that pointed to specific business skills needed by veterinary medical graduates (Table 2).

Table 2: A summary of key business skills required by veterinary medical graduates

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| --- | --- | --- |
| **Theme** | **References within the data** | **References by participant** |
| Finance and financial management | 54 | 16 |
| Communication and interpersonal skills | 53 | 14 |
| Client care and customer relationship management | 21 | 11 |
| The business as a system | 21 | 9 |
| Pricing of services | 16 | 8 |
| Teamwork | 10 | 4 |
| Other important issues raised: Leadership; mental health issues; resilience; marketing; line management through KPIs | N/A | N/A |

Skills in financial management and skills related to human interaction were by far the most discussed in terms of frequency and by the number of participants who identified these as vital. Less-explicit in the data was an important message about the delivery of these skills. Participants were clear that business skills needed to be woven through the veterinary curriculum: integrated, not inserted. There was a fear that a single block, or unit, of learning material about these essential skills would be isolated in the students’ mind and forgotten after a pass-mark had been achieved. Participants suggested that skills needed to be woven-in to practice and examined along with key clinical skills like anaesthesia administration, suturing and wound-dressing.

**Conclusion:** This paper has reported on efforts to develop evidence-based curricula in a discipline closely-related to agribusiness. Both confirmatory and exploratory approaches to the development of evidence-based curricula have been showcased with the confirmatory approach applied when an existing body of knowledge is available on which to build a curriculum while the exploratory approach is applied when very little knowledge exists. The outcomes of both project yielded important information on the latest and most-valuable issues to include in curricula but had the added virtue of linking industry to the academic process of curriculum development. From this experience it is suggested that any curriculum that it remotely associated with industry practice takes a similar approach. This will ensure that students are adequately engaged with practical knowledge to support theoretical components of the curriculum and it will also facilitate the industry engagement with the practitioners of the future.

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