

Using ‘transition pedagogy’ to evaluate the revised Year 1 curriculum for first year veterinary science students

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The First Year Curriculum Principles (FYCP) provide guidance to intentional first year curriculum design which aims to carefully scaffold students’ learning, and support and engage them whilst acknowledging their diversity. In this paper, we apply the FYCP to benchmark the first year veterinary curriculum at James Cook University. First year veterinary students are similar to other commencing university students in their need for development of learning skills necessary for higher education. As well as adapting to the needs of tertiary study, veterinary students also have to develop a range of specific skills necessary for veterinary education early on. The work presented here highlights the range of teaching and learning approaches embedded within the first year veterinary curriculum which assist students to make a successful transition into veterinary science.

Introduction

Over the past two decades, there has been an increasing concern about the rapid explosion of veterinary medical knowledge, the changes in professional and social demands of the profession and the need for veterinary education to develop curricula that address these changing needs of the profession (Bushby, 1994; Craven, 2004; Lewis & Klausner 2003). Today, there is a greater emphasis on generic competencies such as communication skills, team work, problem-solving skills, life-long learning skills, and business skills without sacrificing the veterinary knowledge and skills required by the profession (Jaarsma, Scherpbier, & Van Buekelen, 2009).

At James Cook University (JCU), a Bachelor of Veterinary Science degree program (BVSc) was implemented in 2006. Great effort was invested to develop a curriculum that aimed to “produce graduates who are able to meet the challenges of a changing workplace in the twenty-first century” (Cavalieri, 2009, p.388). JCU aimed to address these challenges by creating a curriculum that is both horizontally as well as vertically integrated with the aim to deliver a learning experience that more closely mimics the complexities of life (Cavalieri, 2009). The curriculum is based on principles of integrated delivery of fundamental science and clinical/service aspects of the veterinary profession. The 5-year course is structured around three phases: Phase 1 - Year 1, Phase 2 – Years 2, 3 and 4, and Phase 3 – Year 5 (Figure 1). Phase 1 is delivered as four equally-weighted subjects in the first semester and two equally-weighted subjects in the second semester. In Phase 2, the curriculum is fully integrated and delivered as one single subject in each semester, consisting of several modules. Phase 3 is largely lecture free and comprises a series of core and elective rotations.

In 2011, following an internal review process and in response to the Veterinary Schools Accreditation Advisory Committee recommendations, a major curriculum revision of Phase 1 - Year 1 commenced. A Year 1 review working group was established to facilitate the redesign of the first year curriculum. The objectives of first year are: a) to provide students with the fundamental principles of chemistry and biological sciences in a veterinary context, b) to introduce students to veterinary science and the veterinary profession and c) to prepare

students for a transition to a more integrated learning experience. In brief, redundant material and repetition was removed from the existing curriculum and ‘veterinary’ content previously embedded in Year 2 was brought down into the second semester of Year 1. Greater emphasis was placed on embedding activities within the curriculum rather than around it or in aid of it.

Phase 1						Phase 2						Phase 3
SP1				SP2		SP1	SP2	SP1	SP2	SP1	SP2	SP1-SP2
3	3	3	3	6	6	12	12	12	12	12	12	24
TV1101	CH1001	TV1102	AG1007	TV1002	TV1003	TV2001	TV2002	TV3001	TV3002	TV4001	TV4002	TV5005-8
TV1101 Veterinary Professional Life 1 CH1001 Chemistry TV1102 Cell Biology & Biochemistry AG1007 Introduction to Plants & Animals TV1002 Veterinary Professional Life2 TV1003 Animal Structure & Function						Integrated Animal Structure & Function 1 & 2		Transition from Health to Disease 1 & 2		Veterinary Clinical Sciences 1 & 2		Veterinary Clinical & Professional Practice

SP= study period; TV1101, CH1001 etc. = subject code in the JCU course handbook; numbers inside squares and rectangle indicate credit points for the indicated subject

Figure 1: Diagrammatic summary of the structure of the BVSc course (2013) at JCU

Evaluation is an integral part of course development where its purpose is to provide a critical appraisal of how well the intended teaching and learning strategies create the necessary conditions, opportunities and expectations for all commencing students to fully achieve the desired learning outcomes. This paper uses the FYCP model (Kift, 2009) as a basis for critical reflection on the development of the reviewed first year curriculum. It briefly introduces each of the six FYCP: transition, diversity, design, engagement, assessment, and evaluation and monitoring and subsequently explores how each principle is contextualised within the revised first year veterinary curriculum at JCU. The aim is to identify strengths and weaknesses in order to further improve the Year 1 curriculum.

First Year Curriculum Principles

Transition

The first FYCP states that “*the curriculum and its delivery should be consistent and explicit in assisting students’ transition from their previous educational experience to the nature of learning in higher education and learning in their discipline as part of their lifelong learning*” (Kift, 2009, p.40).

In line with the FYCP transition, the reviewed first year veterinary curriculum at JCU is designed to assist students with the transition into higher education and more specifically into an integrated undergraduate veterinary program. Orientation is provided within the University as well as within the School as part of an institutionally wide O-week program. A range of activities are provided that introduce students to staff and fellow students, the learning environment and the veterinary program. These activities involve an award winning student mentor program (Hanley, 2001), tours of facilities, familiarisation with student services, inputs from the first year experience coordinator (FYEC) and subject coordinators, other veterinary students and veterinary teaching staff, the academic advisor, the Head of School and a variety of social programs including the *Farmers’ Party*. These activities serve to familiarise students with the university environment and its facilities and also facilitate a sense of social belonging. It was noted by Whitt et al. (2008) that such partnership programs Using ‘transition pedagogy’ to evaluate the revised Year 1 curriculum for first year veterinary science students, refereed paper.

offer an avenue to foster student engagement which, in turn, enhance students' chances to achieve their university goals and abilities (Kuh, 2009).

Transition to university life can be a difficult and challenging experience for some students (Moss, Pittaway, & McCarthy, 2007). An initial step in supporting students' transition to university study is to use curriculum time to communicate clearly to students what they need to learn to successfully progress through the degree (Moss et al., 2007) thus implementing the principle of making the curriculum as explicit as possible. The expectations of the course are explained to the students in the first week of the semester. Students are introduced to the Royal College of Veterinary Surgeons (RCVS) Day One Competencies (RCVS, 2011) which provide a roadmap to explain the design of the first year program and how it links in with later years.

A Personal and Professional Development program (PPD) is embedded within the curriculum and acts as a platform to discuss students' expectations. Within the PPD program, students are organised into small groups of 6 to 8 and provided with a trained facilitator. The PPD program includes a series of workshops guided by an organisational psychologist and typically involves facilitators guiding the students within their small groups through a series of self and/or group exploratory exercises. In Year 1, the focus of these workshops is in areas such as understanding self, small group skills, time management and fundamentals of conflict resolution. Many of the learning areas/skills enhanced by the PPD program are central to a student's development and success as a professional. Chief among those skills is the ability to reflect on their learning experience which will provide an important insight into their strengths and weaknesses both as learners and as future professionals.

PPD workshops are supplemented with a range of other learning support sessions, focusing on process rather than on content to further help students to develop into independent learners and improve their academic performance. For example, exercises to help students determine their preferred learning style are complemented with visits from second year students who share their experiences with the first year students. The learning support sessions also introduce students to the range of facilities and support services available within the school and on campus. Additionally, the FYEC emails each student a weekly outline of the upcoming learning activities as well as strategically timed transition information taking into account students ongoing needs and issues. These weekly emails may include reminders of upcoming assessment due dates or highlight university run workshops that may be useful to support their study.

To encourage a successful transition from first year into the later years of the course, the first year curriculum introduces a range of teaching and learning activities as well as resources that students will encounter throughout the course. For example, the students conduct a 4-week nutrition trial that allows them to make recommendations on the feeding management required to grow weaner pigs to a specified live weight. The study is designed around three treatment diets with five piglets per treatment. The students are responsible for the daily animal husbandry and nutrition of the piglets with one piglet assigned per group of 6-8 students. At the end of the trial, students are required to analyse their findings and make recommendations to a notional client. During this exercise, students learn pig handling skills, research and writing skills, how to work in teams, and improve their knowledge in the areas of pig husbandry, nutrition, animal behaviour and welfare as they relate it to the trial. The exercise demonstrates how students can apply their learned knowledge and skills in a real life scenario.

Diversity

The second curriculum principle states that “*the first year curriculum should be attuned to student diversity and must be accessible by, and inclusive of, all students. First year curriculum design should recognise that students have special learning needs by reason of their social, cultural and academic transition difficulties*” (Kift, 2009, p.41).

The BVSc course at JCU is primarily aimed at providing educational opportunities for recent school-leavers in northern Australia (Figure 2a), preferring students who can demonstrate a form of commitment or desire to work in tropical and/or rural regions. A small number of places are made available for mature students and international students. Compared to the more traditional Australasian universities offering veterinary qualifications, the academic entry requirements are significantly lower at JCU (Allan, 2013). For example, in 2013, 94% of all domestic students enrolled in a BVSc at the University of Queensland had an OP score of 1 or 2 compared to only 15% of domestic enrolments in the BVSc at JCU. In addition, a significant proportion of our entering students come from a low socio economic status (SES) background (35% average over last 6 years; Figure 2b). A small number of Aboriginal and Torres Strait Islander students (2% average over the last 6 years) enter the BVSc course through the Indigenous Health Career Access Program. This pathway specifically supports first year indigenous students by scaffolding practical skills and knowledge to better cope with the demands of university study. Furthermore, it should be noted that there is significant diversity among commencing students with regards to previous animal exposure.

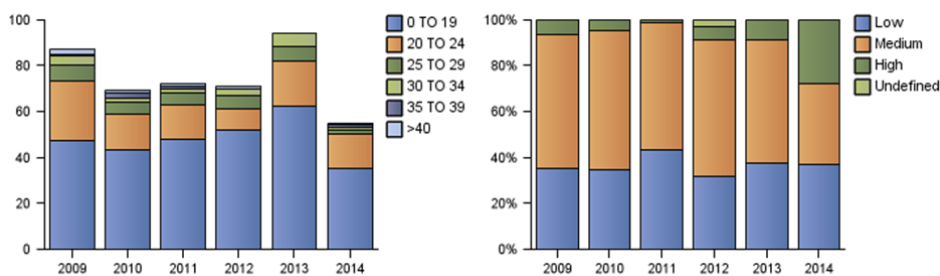


Figure 2 a) Age distribution of first year veterinary students at JCU over the last 6 years; b) SES distribution of first year veterinary students at JCU over the last 6 years

The first year curriculum has been developed to cater for students with a diversity of learning backgrounds without making assumptions about the students' entry level knowledge. For example, essential foundational knowledge (e.g. chemistry and biology) is not assumed but is instead taught in Year 1. The course endorses the Tertiary Education Quality and Standards Agency (TEQSA, 2011) imperative to incorporate appropriate processes to address the development of key graduate attributes including English language proficiency. Early diagnostic literacy and numeracy assessment is incorporated within the curriculum and post-test tuition is provided where needed. We work closely with the learning advisors to scaffold these generic skills throughout the first year curriculum through the use of case studies and other authentic learning activities. The students receive early formative feedback on their reflective writing skills which allows the identification of students that need further support.

Within the PPD workshops, students are encouraged to self-assess using the Myers-Briggs Type Indicator tool, to identify where they fit within a team (Belbin Team Roles) and to familiarise themselves with their preferred learning style. Each of these workshops is followed up with a reflective report which provides students with the opportunity to reflect and recognise the great diversity and potential of their cohort. Communication, time and Using 'transition pedagogy' to evaluate the revised Year 1 curriculum for first year veterinary science students, refereed paper.

stress management skills are considered to be critical to the success of our students and so these topics are emphasised early within the PPD workshops and support tutorials. Early development of these skills should help time-poor students to find a healthy balance between study, paid work and other commitments.

Animal handling skills are one of the core competencies that students need to develop to become a successful veterinarian (Collins & Taylor, 2002). Allan (2013) noted that a common reason for poor performance in a veterinary course is underdeveloped animal handling skills, usually due to a lack of confidence and experience. At JCU, animal handling skills are not assumed, but are introduced throughout the first year curriculum in a manner that enhances a positive and confident attitude towards handling of a range of animal species. Students move through a series of compulsory animal handling classes within small groups and are given opportunities to further improve the learned skills in optional revision classes.

Design

The third curriculum principle states that “*the first year curriculum design and delivery should be student focused, explicit and relevant in providing the foundation and scaffolding necessary for first year learning success*” (Kift, 2009, p.41).

Traditionally, veterinary curricula have been teacher-centred and topic-based with an almost overwhelming amount of detail to be remembered by students, particularly in the early years of the course (Bushby, 1994). This often left students wandering about the relevance of the lecture material (Allan, 2013). In line with the FYCP design, a number of delivery tools have been implemented in Year 1 to aid in the integration of content areas, including specifically designed clinical case studies that place a range of fundamental issues in a veterinary context. The multidisciplinary case studies are used to reinforce taught material or introduce new knowledge and skills. In addition, students learn research and literacy skills and how to work in teams, while being introduced to the importance of ethics within the veterinary profession. These case studies provide students with an opportunity to contextualise basic sciences with ethical and professional development issues. It has been suggested that integrated learning strategies help to improve motivation and foster a positive approach to learning (Dahle, Brynhildsen, Behrbohm Fallsberg, Rundquist, & Hammer, 2002; Vars, 1997).

The development of learning outcomes was critical in the review of the first year curriculum. An awareness of, and preparation of students for the RCVS Day One Competencies (RCVS, 2011) informs the curriculum at all levels. The learning outcomes provided the framework around which learning activities, resources and assessment were developed to ensure the desired learning goals were achieved. The learning outcomes for each subject were mapped against the course learning outcomes and the associated assessment items, confirming alignment of assessment, volume of learning and learning outcomes across the subject and course (Table 1). The learning outcomes and assessment items are clearly documented in the subject outline which follows a consistent template across the School and University and acts as a key teaching quality assurance measure. In addition, teachers are encouraged to provide learning outcomes for each learning activity students engage with.

A clear weakness in the review process was the lack of an extensive curriculum mapping tool. However, lecture titles and keywords have been documented to facilitate mapping. Using the learning outcomes, overlap, repetition and redundancy was identified and removed from the curriculum.

Course Learning Outcomes (CLO) – Keyword(s)														Product assessment item			Performance assessment item					
CLO1. Competency														Practical report	Reflective report	Case study report	Animal handling report	On course exam or quiz	Practical exam	MCQ exam	Written exam	
CLO2. Professional conduct																						
CLO3. Considerate of wider implications																						
CLO4. Medical and diagnostic skills																						
CLO5. Public health																						
CLO6. Research and data evaluation																						
CLO7. Workplace performance																						
CLO8. Economic and practical sustainability, tropical agenda																						
CLO9. English proficiency																						
CLO10. Adaptability of solutions to workplace applications																						
CLO11. Lifelong learning, self care and vocational sustainability																						
TV1002:06 Veterinary Professional Life 2 - Subject Learning Outcomes (SLO)																						
								8						SL01. Demonstrate knowledge and understanding of the importance of animal industries to the Australian economy			●			●	●	
								1	1					SL02. Demonstrate knowledge and understanding of the diversity of career opportunities available to veterinarians							●	
1				5										SL03. Demonstrate the principles of safe handling of a variety of animal species (pigs, poultry, goats, aquaculture, dogs and cats, laboratory animals and reptiles)				●		●		
	2			5			8							SL04. Demonstrate knowledge and understanding of the welfare and ethical issues in the use of animals for food and fibre production, sport, companionship, entertainment and research			●		●	●	●	
1			4											SL05. Demonstrate knowledge and understanding of the aspects of genetics relevant to animal breeding programs	●				●		●	●
1			4											SL06. Demonstrate knowledge and understanding of the nutritional principles relevant to the nutritional management of livestock and companion animals	●				●	●	●	●
							8							SL07. Demonstrate knowledge and understanding of environmental influences on grazing animal production					●	●	●	●
1														SL08. Demonstrate the ability to tie surgical knots						●		
								9						SL09. Demonstrate the ability to acquire, organise and communicate new information	●		●	●				
		3												SL10. Be able to reflect on current knowledge, skills and attitudes and the ability to work and communicate within a team		●	●			●		

Table 1: Mapping of TV1002:06 Subject Learning Outcomes against Course Learning Outcomes and Assessment items (format derived from J. Smithson, School of Nursing, Midwifery and Nutrition, JCU)

Engagement

The fourth curriculum principle states that, “*learning, teaching and assessment approaches in the first year curriculum should enact an engaging and involving curriculum pedagogy and should enable active and collaborative learning*” (Kift, 2009, p.41).

Student engagement is a multifaceted and integral part of the first year experience (Zepke, 2013). A substantial body of research shows that students who are engaged in educationally purposeful activities are more likely to persist and succeed in their studies (Kuh, Kinzie, Buckley, Bridges & Hayek, 2006). In line with the FYCP engagement, the use of case studies, oral group presentations, small group practical classes, and problem solving exercises provide a breadth of opportunities for active and collaborative learning. Many of these activities encourage students to engage with the material both inside and outside the classroom. For example, small-group case studies encourage peer interactions by discussing the assignment topics with each other and exploring different perspectives of veterinary ethical issues within their small groups. Other peer interactions include students that have already well-developed animal handling skills assisting fellow, less confident students and hence enriching the learning of others and at the same time becoming more actively engaged with the material taught.

Student-staff interactions further facilitate student engagement. For example, half-way through the semester, a 2-hour multiple station revision workshop is organised around lunch time with free sausages and soft drinks. First year students, tutors and staff are invited and are able to engage with the curriculum in a more social way. Students are also given the opportunity to engage with the industry through careers seminars and co-curricular activities such as BBQ and practitioners days organised by the Australian Veterinary Association. Student feedback indicates that these activities appear to contribute to the students’ sense of belonging and making them feel part of the veterinary community right from the start.

A number of strategies are put in place to monitor student engagement. For example, the PPD facilitators help monitor student progress and provide feedback to subject coordinators on potential at-risk students. Practical classes are compulsory with non-attendance being followed-up. An early warning system has been developed, based on student attendance and poor performance in early on-course assessment. At-risk students are contacted half-way through the semester and invited to see the FYEC and/or academic advisor to establish a management plan tailored to each individual student’s needs. A follow-up visit is scheduled later in the semester to assess and revise the learning plan.

Assessment

The fifth curriculum principle states that “*the first year curriculum should assist students to make a successful transition to assessment in higher education, while assessment should increase in complexity from the first to later years of curriculum design*” (Kift, 2009, p.41).

Consistent with the FYCP assessment, learning is scaffolded by adapting assessment throughout each semester. Every subject has formative assessment scheduled within the first 4 weeks of each semester to provide early feedback to students and staff on students’ engagement and achievement. Further formative assessment exercises occur at least twice during each semester. On-course assessment is set at 40% and comprises a diversity of invigilated and non-invigilated assessment. Students are given access to model assignments if deemed necessary, particularly when a new type of assessment task is introduced. Marking

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schemes and/or rubrics are developed for all assessment tasks and assessment task verbs are clearly defined to clarify assessment expectations.

Examinations incorporate a variety of assessment tasks. For example, in one subject the end-of-semester assessment contributes to 60% of the total mark and includes a 2-hour written paper, comprising multiple choice, short answer and longer essay questions and a pass/fail practical exam. Students are familiarised with the nature of the written paper in a number of examination review sessions and have the opportunity to sit a mock exam. The practical exam is designed to assess students' competency in the area of animal handling. Students are required to demonstrate competency in all essential skills taught in the practical classes as they provide the foundation of clinical skills for later years and ultimately for veterinary practice. Students that are deemed "not competent" are offered remedial classes before they are re-assessed to ensure they achieve the required standard before continuing in the course.

Evaluation and monitoring

The final curriculum principle states that "*good first year curriculum design is evidence-based and enhanced by regular evaluation that leads to curriculum development and renewal designed to improve student learning*" (Kift, 2009, p.41).

Consistent with the FYCP evaluation and monitoring, evaluation of the Year 1 curriculum occurs regularly using a combination of externally benchmarked, institutional and in-house feedback tools, including online subject and teaching surveys and student-staff feedback sessions. These tools provide evidence for assessing quality and provide a platform to support the changes brought about to improve teaching and learning.

The institutional online subject and teaching surveys provide students with a formal and confidential method to provide feedback on their subjects and teaching staff. Each semester, the results are assessed, prioritised and discussed at the Veterinary Science Curriculum Committee meetings for appropriate action. Qualitative comments from the online subject surveys received following the implementation of the revised curriculum in 2013 validated that the revised Year 1 curriculum '*supports students through intentional curriculum design that motivates students to learn, provides a positive learning climate and encourages students to be active in their learning*' (Kift & Field, 2009, p.2). For example one student commented:

"The pig growth study had to be the highlight of the year. Not only did it reinforce our knowledge of nutrition, it gave us a chance to practice general husbandry activities and learn what to look for when caring for animals. It gave us a sense of responsibility and really tested how well we worked within groups. It also gave us something to look forward to after hours of lectures. It gave us a break and somewhere to go when we needed to relax."

Furthermore, student comments indicated that the revised curriculum helped to orientate and support first year veterinary students to the BVSc and the profession. Examples include:

"I enjoyed every aspect of this subject as it is the reason I am at university. It was interesting, hands on and the lecturers are all willing to answer any questions. All round, a valuable subject for an introduction into veterinary science"

"The best aspect of this year was having our eyes opened to the world of veterinary life, including jobs and real world application/ethics"

"The outcomes and expectations were made very clear, and the lectures were all clearly set out and well organised on LearnJCU"

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An important feature of these surveys is that we ‘close the loop’ by making the results and actions available to the students in the subject outline. For example, in response to the survey results, we incorporated an extra tutorial on large animal handling prior to the practical class to ensure that all students feel better prepared going into the animal handling sessions.

The School and University also participate in externally benchmarked student surveys including the University Experience Survey (UES) and Course Experience Questionnaire; data from these are evaluated and subsequently inform curriculum planning and student engagement and transition practices for first year and across the course lifecycle. The 2013 UES results indicated that the overwhelming majority of first year veterinary students were satisfied with their overall experience at JCU, with 91% of students rating the quality of teaching as ‘good’ or ‘excellent’. Most students (88%) reported that they felt engaged as a learner (77%) and acknowledged that the experience at university had helped them to develop skills (88%). These results were the highest within JCU and well above the national averages, including when compared with other institutions offering the same field of education.

Finally, students and staff meet at least twice each semester to give students the opportunity to provide feedback on a more ongoing basis. Issues that arise during these meetings are managed through either the subject coordinator, the FYEC or the academic advisor and feedback on actions communicated back to the students.

Conclusion

This paper demonstrates that Kift’s (2009) First Year Curriculum Principles can be used to validate the revised first year veterinary science curriculum at JCU. This institutional case study provides evidence that the revised curriculum incorporates the six FYCP. Highlights of the first year curriculum that assist students with their transition into higher education and into the veterinary practice include: the integrated and scaffolded nature of the curriculum, the Personal and Professional Development program, the support of group facilitators, the use of multidisciplinary case studies, the student mentor program, the learning support sessions, the animal handling classes, the nutrition trial and the engagement with the industry.

The main goal of this article was to benchmark the revised first year curriculum with the FYCP (Kift, 2009). Further work is needed to see if the revised BVSc Year 1 curriculum at JCU addresses all aspect of students’ transition by evaluating the students’ experiences, retention and progression, graduate capabilities and employer feedback. However, early feedback from students, staff and graduates indicates the review of the first year curriculum is achieving the intended aims.

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