

Lifelong Learning and Reflective Practice

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Box 27.1: Key messages

- To meet the new demands of their profession and keep up their expertise, veterinarians need to engage in lifelong learning (LLL).
- Competencies needed for LLL relate to autonomous (self-directed) learning and to learning in social interaction.
- Students' development as self-directed learners needs to be encouraged through setting the climate for collaborative and supportive learning, in which educators and students are mutually respectful. Here, teachers should provide adequate student mentorship.
- Epistemological beliefs are highly relevant for the way students learn, teachers teach, and professionals keep on learning.
- To become effective lifelong learners, veterinary students have to have control over and feel responsible for their learning experiences and outcomes, during the curriculum and afterward.

Introduction

The work of veterinarians has changed tremendously in recent decades and will be subject to change in the future. To meet the new demands of their profession and keep up their expertise, veterinarians need to engage in continuing professional development (CPD) and use opportunities for lifelong learning (LLL), both formal and informal (Larkin, 2010; Lee, 2003; Laal and Salamati, 2012). Lifelong learning leads to an enriching life of self-fulfillment and is positively related to mental wellbeing in veterinarians (Laal and Salamati, 2012; Mastenbroek *et al.*, 2014). Learning will need to take place on an

ongoing basis, individually and in interaction with others (Dale, Pierce, and May, 2013). Therefore, not surprisingly, preparation for LLL is – and has been (see Box 27.2.), an important goal in many (veterinary) curricula (Jaarsma, 2009).

Preparing for Lifelong Learning

Lifelong learning is not easy for professionals such as veterinarians, and they experience different barriers to participation in CPD (de Groot *et al.*, 2012; Dale, Pierce, and May, 2010; Moore, 2000). Thus, veterinary professionals ought to become aware of the importance of



Box 27.2: Reflections on lifelong learning

He who expects that he doesn't need to learn anything new after leaving this school building, has a too narrow minded conception of his profession and his destiny, and to be sure he will never get on in his art (Alexander Numan, first director of the Dutch vet school, 1827).

LLL from the start of their education. They need to acquire the knowledge, the attitudes, and the skills necessary for development of their LLL competencies after graduation. To ensure that veterinarians will be involved in LLL, some people focus on accreditation of formal CPD (May, 2012; Caple, 2005), but we will focus on competencies for and beliefs about LLL, following the advice of Stephen Billett not to confuse lifelong learning with lifelong teaching (Billett, 2010). In this chapter we will explore what competencies veterinarians need for LLL on their own and with others, consider how to develop these during the curriculum, and propose strategies to enhance learning beyond veterinary curricula.

Lifelong learning is a concept that refers to “activities a person performs throughout their life to improve their knowledge, skills, and competence in a particular field” (Koper, 2007, p. 71). Many competencies necessary for LLL have been described, from which we will address the following two categories: autonomous competencies, necessary to manage one’s own self-directed learning; and relational competencies, being able to interact and learn in social interaction within heterogeneous groups.

Essential Components

Within LLL, reflective practice is an essential component. Reflective practice is about learning from one’s experience; understanding one’s personal beliefs, attitudes, and values; and linking new to existing knowledge (Mann,

Gordon, and MacLeod, 2009). It is not only a cognitive, individual, and internalized activity, but also highly social (de Groot *et al.*, 2013; de Groot *et al.*, 2012; McArdle and Coutts, 2010). Therefore, reflective practice asks for learning conversations that are critical through the exploration of options, assumptions, and evidence (de Groot *et al.*, 2012). In discussing individual learning and learning in social interaction, we align with two major perspectives on learning: learning as an individual activity of acquiring knowledge and skills; and learning as participation in learning communities (Sfard, 1998).

For reflective practice, veterinarians need competencies in self-directed learning (SDL). SDL is necessary to construct knowledge on your own and collaboratively at the workplace. Because the goal of LLL is “equipping people with skills and competencies to continue their own ‘self-education’ beyond the end of formal schooling” (Candy, 1994, p. 15), we consider SDL to be a prerequisite for LLL. Veterinary schools should help students to become self-directed learners.

Individual Learning

Self-Directed Learning

Knowles (1975, p. 18) defines SDL as “a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes.” Self-directed learning (SDL) differs from self-regulated learning (SRL); in SDL the learning task is always defined by the learner, while in SRL the learning task can be generated by the teacher. Self-directed learning clearly provides a crucial role for the learner at the outset of the learning task (Loyens, Magda, and Rikers, 2008). In a curriculum with tight-set outcomes, SDL’s premise of full autonomy regarding learning tasks is challenging to implement.

How to Become a Self-Directed Learner

Readiness to Learn

Students entering veterinary education will differ in the way they learn, which depends largely on characteristics such as intelligence, personality, and former learning experiences, but also on their – often implicit – beliefs about knowledge and knowing (personal epistemology; Hofer and Pintrich, 2002). Such beliefs drive behaviors. It makes all the difference to learning whether (see Box 27.3) an individual believes that knowledge is something received from others; that problems are solvable and answers can be right or wrong; or, at the other end of the spectrum, that knowledge is constructed on what one already knows, and develops through experience and reflection on experiences (Hofer and Pintrich, 2002). Students engaging in SDL should be aware of their own epistemological beliefs, and how these beliefs influence their learning. For example, when participants in a group discussion have a relativist understanding, where “all opinions are equally right” (Kuhn, 1999, p. 23), group discussion will not become a valuable learning experience or an opportunity for knowledge-sharing (Weinberg, 2015).

Since not all students entering a course will be familiar with the concepts of SDL and reflective practice, these concepts require explicit explanation regarding their meaning, the competencies required, and how they can be learned. Various skills and attitudes toward

learning are required for successful SDL, for example the abilities to:

- diagnose their own learning needs realistically;
- take the initiative in making use of resources (i.e., teachers and peers as resources for diagnosing learning needs or as facilitators or helpers, as well as learning materials appropriate to different learning objectives);
- translate learning needs into learning objectives (Knowles, 1975).

However, most of all students require an adequate self-concept as a nondependent and self-directed person.

Learning Objectives

Learning objectives are motivating, especially for learners with a goal-oriented learning orientation (Teunissen and Bok, 2013). Learning objectives direct learning activities; achieving objectives is perceived as a successful (learning) experience that raises self-efficacy. Once learners have diagnosed their learning needs and translated these into learning objectives, they formalize them by making a personal development plan. In formal training, the preparation of development plans is often a joint process between student and mentor.

Engaging in the Learning Process

Students need to understand themselves as learners in order to understand their needs as



Box 27.3: Focus on epistemology

Epistemological beliefs influence knowledge-sharing at work and learning at school, and may have the following dimensions (Hofer and Pintrich, 2002):

- Whether knowledge is certain – absolute to tentative
- How knowledge is structured – simple to complex
- What is the best source of knowledge – handed down by authorities to derived by reason
- Whether knowledge is under your own control – you are born with a certain ability to learn to your ability to learn can be changed
- With what speed knowledge is acquired – quickly or not at all to gradually

self-directed learners. These needs concern, for example, the instructional methods they prefer for gathering and processing information. Do they prefer active or reflective learning, verbal or visual explanations? They need to understand their own learning preferences because SDL requires a deep approach to learning. Understanding themselves as learners means that they know what learning resources they need. As women now dominate student enrollment in veterinary education all over the world, it is relevant to examine the consequences for teaching, learning, mentoring, professional development, and leadership. Male and female students might have different ways of knowing and learning. Research focusing on women's development and ways of knowing reveals that women prefer a less authoritarian and more person-centered learning environment, and supports the adoption of student-centered approaches to teaching and learning in veterinary education (Taylor and Robinson, 2009).

Evaluating Learning

Evaluating learning should not be confused with assessment only, although summative assessments can be valuable for evaluation of the acquisition of knowledge (i.e., exams, case reports, or essays) or mastering specific skills (i.e., objective structured clinical examinations). Evaluating learning in an SDL context involves evaluation of progress, for example by seeking feedback of peers, colleagues, or faculty members and subsequently reflecting on the feedback gathered. Self-reflection includes examining assumptions, beliefs, and emotions regarding learning and learning objectives. It is one of the most important and at the same time most difficult aspects of SDL.

Reflective Practice

The aforementioned strategies for the development of SDL call for curricula that allow for authentic learning experiences, such as longer clinical placements or extramural education, where students integrate theory into real-life practice and learn teamwork competencies

through socialization. Here, in the workplace, they will have authentic practice experiences on which to reflect and become reflective practitioners.

Reflective practice is an increasingly important aspect of CPD. Reflective skills and reflective practice seem to be essential for continuing personal and professional development in young veterinarians (Mastenbroek *et al.*, 2015). Reflective practice enables individuals to look back on, learn, and improve their own practice. Since the obligation to keep their knowledge and skills up to a professional standard is part of the implicit social contract that health professionals have with society, it needs no further explanation that helping students be prepared for reflective practice must be part of the veterinary curriculum.

Reflection-on-Action

Schön (1983) argues that it is impossible for professionals to possess all the knowledge and skills required to solve problems in each and every complex situation they face every day. Despite this, professionals have to act and while acting use reflection. Schön (1983) called this type of reflection reflection-*in*-action, in contrast to reflection-*on*-action, which is reflection in which professionals engage after they have solved the problem and look back on their decisions.

Many descriptions of reflective practice exist, and often they are intermingled with terms such as reflection, reflective thinking, and critical reflection (Brookfield, 2009). Differences between these concepts are related to the focus of the reflection: whether reflection should be on your own behavior, on assumptions guiding your behavior, or on power structures at play in the workplace, which affect how the work is being done. In this chapter, we will look at reflective practice as deep approaches to learning and meaning-making in the workplace or during authentic learning situations within the curriculum.

Reflection-on-action helps to make subsequent meaning of complex situations and enables professionals to learn from experience.



Box 27.4: Focus on benefits to, and limitations of, reflective practice

Davies (2012) identified the benefits as well as the limitations to reflective practice in her review of the literature on behalf of general practitioners.

The benefits are:

- Increased learning from an experience or situation
- Promotion of deep learning
- Identification of personal and professional strengths and areas for improvement
- Identification of educational needs
- Acquisition of new knowledge and skills
- Further understanding of own beliefs, attitudes, and values
- Encouragement of self-motivation and self-directed learning

- Could act as a source of feedback
- Possible improvements in personal and clinical confidence

The limitations are:

- Some practitioners may not understand the reflective process, may feel uncomfortable challenging and evaluating own practice, and may have some confusion as to which situations/experiences to reflect on
- Reflective practice could be time consuming and may not be adequate to resolve clinical problems

The inclination to and ability for reflection appear to vary across individuals and across contexts in which individuals practice (see Box 27.4). Nevertheless, the ability for reflective practice seems to be amenable to development provided that the learning environment is encouraging, for example by supervisors' behaviour. Curricular interventions (see Box 27.5), aimed at promoting reflection and reflective practice, are now being incorporated in veterinary undergraduate curricula, even though the evidence to support and inform these interventions and innovations is limited.

How to Support Learning of Lifelong Learning Competencies in (Veterinary) Medicine

The main methods for preparing students for LLL are the use of portfolios, mentoring, and learning from consulting the research literature. As reflection is an essential skill in the process of SDL, and as we know that this is a competency that has to be developed through training, it is important to guide educators in structuring the development process.



Box 27.5: Examples of curricular interventions aimed at promoting reflective practice

Individual reflective writing assignments

- Learning journals in which students reflect on the learning processes they experienced
- Daily blog writing concerning critical incidents or meaningful events
- Mission statements to help them make professional identity formation explicit

Assignments for groups

- Critical incident technique where students reflect with peers on critical incidents that occurred in their workplace
- Peer-group meetings with the aim of making sense of experiences in relation to self, to others, and to contextual conditions, and planning how to act or to respond in such situations in the future

Source: Smith, 2011.

Learning with Portfolios

To support the learning of reflective practice and SDL, portfolios are frequently used. A portfolio serves as an outline for independent study, a letter of intent, and a tool to aid in the evaluation of achievement. Knowles (1975) describes how, in the design of a learning portfolio that serves in the achievement of SDL skills (he used the term "learning contract"), one should include learning objectives, learning resources, and strategies to be used, evidence of accomplishment, and criteria and means of validating evidence. To be effective:

- The design of the portfolio should be tailored to the intended purpose.
- Portfolios should best be introduced in curricula where learning in authentic situations is a key feature.
- Conditions must be met that facilitate successful introduction of portfolios, such as teacher and student support and commitment by educational leaders (van Tartwijk *et al.*, 2007).

Portfolios in veterinary education may have a focus primarily on formative assessment or on summative assessment (Mossop, 2008). A learning portfolio that contributes to LLL competencies should include reflective writing in action, on action, and for action, which makes the design complex. And even with a well-designed learning portfolio, an active and committed teacher (mentor) is indispensable (Driessen *et al.*, 2005).

Mentoring

A mentor is a more experienced adult who helps a less experienced individual learn to navigate the world of work through career-related and psychosocial support (Kram, 1985). In veterinary medicine, professionals have recognized the importance of mentoring students, since the recruitment and retention of students appear to be difficult (Niehoff, Chenoweth, and Rutti, 2005). In a study on mentoring within the veterinary world, mentors' behaviors aimed at career development and socioemotional support appeared to be positively related to

the perceived effectiveness of the relationship. Mentors developed trusting relationships with their protégés by encouraging and reinforcing them, accepting them as competent professionals, helping them attain desired positions, and providing appropriate challenges (Niehoff, Chenoweth, and Rutti, 2005). Mentors may also function as role models. When reflective practice or SDL is supported by portfolios, several studies show that stimulating and guiding reflection on portfolio issues through mentoring was even more important than the portfolio use itself (Bok *et al.*, 2013; Mann, Gordon, and MacLeod, 2009; Driessen *et al.*, 2005).

Learning from Evidence-Based Practice

Practicing evidence-based veterinary medicine is an opportunity for veterinarians to keep their knowledge up to date, because in the literature they will find recent knowledge from their domain. Therefore, they have to (learn to) search for and judge the literature during their studies (Cockcroft and Holmes, 2004). As an example, to enhance veterinary technology students' research capabilities, a teaching program has been described where students worked in self-selected dyads to author a scientific case report, based on authentic cases from their clinical practice. This approach was reported to be an enjoyable and valuable learning experience, and not only contributed to writing and presentation skills, but helped students to become more fully formed professionals (Clarke *et al.*, 2013).

Learning in Social Interaction: Learning Communities

In veterinary practice much of the learning takes place in social interaction: veterinary professionals learn during their interactions with patient owners, during dyads with students on extramural placements and in learning groups, within their own practice, or with professionals from other practices (May and Kinnison, 2015; Scholz, Trede, and Roldal, 2014). Nevertheless, studies about (lifelong)

learning of veterinarians rarely pay attention to communities, disregarding the collaborative nature of their work (Scholz, Trede, and Roldal, 2014; de Groot *et al.*, 2012). Learning groups may have different goals and different names. A broad division could be made between groups where discussion has their personal and professional development, management, and communication in mind (Mastenbroek *et al.*, 2015), and groups where discussions are primarily set up to keep their veterinary knowledge up to date and to solve problems in the veterinary domain that occurred in their clinical practice (de Groot *et al.*, 2012). The latter are often called learning communities or communities of practice.

The concept of communities of practice, introduced by Etienne Wenger (1998), has transformed from a model about a master with apprentices, to a model focusing on the interaction between individuals, toward a knowledge management concept (Cox, 2005). We consider the second the most attractive kind of learning communities for veterinarians: small groups to share and create knowledge about their profession collaboratively. Participants in these communities should be active in their learning process and engage in collective inquiry.

Critically Reflective Dialogs in Communities

Learning in communities is potentially valuable, but it has to be ensured that learning in communities does not only socialize people into existing practices, but helps them innovate and observe their work in a critically reflective manner (de Groot *et al.*, 2012). Essential behaviors in such learning communities are asking for feedback, challenging groupthink, critical opinion-sharing, research utilization, and openness about mistakes (de Groot *et al.*, 2012). In order to become valuable contributions to LLL, communities need organizational support (Jang and Ko, 2014), and they require a moderator who asks reflective questions and enables members to critically reflect on their learning process (see Box 27.6). And finally, the groups should be heterogeneous but not

too heterogeneous (van Knippenberg, de Dreu, and Homan, 2004). When the background of participants is too diverse, they lack common ground for an in-depth discussion, while when it is too similar, there is a risk of confirmation bias and groupthink.

Communities for Professionalism

Learning in communities within curricula as well as in veterinary practice is used to build and share subject-specific knowledge and to contribute to professionalism. An example of the latter is the development of personal or professional skills such as communication, collaboration, and management (Mossop, 2013). In models for reflection, a moderator may help clarify a question from a group member who brings up a problem, and assist in collective reflection on the solutions that came to the fore in the group (see Box 27.7). Taking part in communities for professionalism in turn contributes to reflective behavior through sharing of experiences, and the corresponding feelings and thoughts, allowing for a different perspective on a personal situation (Mastenbroek *et al.*, 2015).

How to Prepare Students for Learning in Social Interaction

To help students acquire LLL competencies during their studies, they have to develop the ability for critically reflective dialog in group discussions (see Box 27.6). Students develop this ability during education that pays attention to questions such as “How can we deal with the ambiguity of not knowing?” and “How can we ask for and give feedback?” (Bleakley and Bligh, 2008). And, self-evidently, students have to be allowed to work in groups often and get feedback on their behavior in such groups regularly (Koskinen, 2010).

How to Support the Development of Lifelong Learning Competencies

A common misconception with concepts such as SDL is that teachers do not have a role to



Box 27.6: Focus on critically reflective dialogues

Discussions within learning communities need to be critically reflective, which asks for the following behaviors:

Openness about mistakes

Members talk about a mistake at their own workplace, or ask questions about presumed mistakes of others. They show concern. They evaluate what went wrong, and give some indications about the effect the mistake had, or will have, on their future behavior or knowledge. Community members interact about possible explanations and discuss alternatives.

Research utilization

Members mention research findings, and indicate that these influenced their thinking and understanding. Research findings can come from different sources: literature, experts, continuing education meetings or pharmaceutical companies.

Challenging groupthink

A member doubts whether the conclusion reached is valid by challenging the consensus or the lack of alternative options. Consensus can be about the content ("That is just the way it is") or

the group process (the way the discussion has developed thus far)

Feedback asking and giving

A member mentions something they have done, and reflects on what happened and what thoughts they had about the effect on their future behavior. These evaluative remarks show that a participant wants to know what others think about (their thoughts on) their behavior. Others interact on the issue at hand.

Experimentation

Members talk about thought experiments, and formulate hypotheses to explore, generate, and imagine alternatives. The purpose of their explorations is to understand the issue at hand better. They discuss the thought experiment collectively. The hypothetical situation can have its origins in their own practice, but it is not just a real-life situation that they remember and share with others.

Critical opinion sharing

Members present information, ideas, and opinions in a manner that makes joint evaluation possible, which requires being explicit about reasons.

play. This is not true: they need to perform a different role, which may be quite challenging. Teachers need to encourage and guide students to become self-directed learners through setting the climate for collaborative and supportive learning, where educators and students are mutually respectful. Teachers should explain their own role and stimulate the establishment of fruitful relationships between students for the enhancement of collaborative learning.

In addition, teachers need to provide adequate student mentorship. Teachers should be

role models with regard to LLL and have a solid understanding of the necessary competencies and its associated skills. For teachers, as for students and their mentors, epistemological beliefs are highly relevant to the way they teach. Their capacity for nurturing autonomy in students has shown to be related to such beliefs (Roth and Weinstock, 2013).

Faculty Development

To equip students with the skills and competencies to continue their own LLL, teachers



Box 27.7: How to be a moderator in a learning community

The main role of the moderator in a learning community is to support and inspire the communication processes for knowledge construction. Moderators need to be well informed about the clinical case and also its objectives. Moderators may fulfill their role in different ways: as more of a chairperson or more as someone who creates the conditions for fruitful discussions (Heron, 1999). They may display the following kinds of behavior:

- Goal-oriented planning
- Helping to articulate reasons for doing things, meaning raising the consciousness of the whole group
- Making emotions negotiable
- Structuring, similar to the role of a chairperson
- Assisting in creating an inspiring climate

This boils down to several essential activities of moderators (Lane, 2008; Sargeant, 2010):

- Posing higher-order and reflective questions to promote discussion and activate reasoning processes
- Asking group members to explain phenomena or define terms
- Keeping members on track by reminding them of their learning goals
- Role modeling positive interactions
- Identifying, in a constructive manner, differences in opinion between members
- Making power structures in the group explicit.
- Seeking, when relevant, to reach a consensus
- Encouraging, acknowledging, or reinforcing participants' contributions
- Setting a climate for learning by encouraging people to explore
- Presenting follow-up topics for discussion (*ad hoc*) and summarizing discussions
- Refraining from "teaching" the group

have to broaden their skill set and abandon the idea of knowledge transfer (Boerboom *et al.*, 2009). In addition, they should become more knowledgeable about learning theories. In a survey in the United States, veterinary teachers expressed an interest in knowledge about learning theories (Haden *et al.*, 2010). In 2006, Steinert and Mann already identified that faculty development programs in general ask for a longitudinal setup with peer coaching, mentorship, learning communities, and SDL. How and whether evidence about faculty development from the medical education research literature has been translated into veterinary initiatives and what specific context-specific challenges have been met along the way is as yet unknown (Bell, 2013).

In preparing teachers to help students in the acquisition of LLL competencies, they have to experience such learning processes themselves, individually and in social interaction. Through such experiential learning processes, teachers

will probably learn that their own role modeling is more relevant for students than (the development of) valid and time-consuming assessment practices. Nevertheless, even though assessment of LLL competencies is hard, it is not impossible.

Assessment of Lifelong Learning Competencies

For assessment to become useful as a means of enhancing LLL competencies, the most important lesson is, as described by Candy, Crebert, and O'Leary (2004, p. 150), to "be weaned away from any tendency toward over-reliance on the opinions of others." Veterinary education should be designed in such a manner that professionals in practice are able to self-assess their performance as well as their learning processes. Such assessment practices ask for a focus on longitudinal assessment where students have to

show evidence of their progress, for involvement of learners in the manner and the frequency with which they will be assessed, for peer and self-assessment, and for evaluation not only of the teaching but also of the assessments. Assessment in such educational formats is based on good reasoning, not on right or wrong answers (Ramaekers, 2011). To become effective lifelong learners, veterinary students have to have control over and feel responsible for their learning experiences and outcomes, during the curriculum and afterward.

An example of an assessment format that fits such an approach is peer feedback. Peer feedback may be helpful for the person who receives feedback as well as for the person who gives feedback, because it activates reflection on their own work (Nicol, Thomson, and Breslin, 2014). Peer-assisted learning may contribute to the acquisition of LLL competencies because it has a focus on reflecting on your own and other's work, and not waiting for the teacher's opinions. As an attractive side effect, it may save faculty time (Strand, Johnson, and Thompson, 2013). When peer feedback is used later on, when veterinarians work in practice, its introduction is probably not an easy task; for medical general practitioners the use of peer assessment in the context of a formal revalidation process has been difficult (Curnock *et al.*, 2012).

How to Enhance and Maintain Lifelong Learning in Veterinary Practice

Preparation for LLL in veterinary school is essential to equip individuals for active behaviors that influence their development. Once working in veterinary practice, being motivated to perform these active behaviors is crucial for LLL. Motivation for LLL alters over time, and is affected by personal factors and (social) experiences in the (work) environment.

Personal

Personal factors are not only learning skills, but also beliefs about learning and knowledge (Bath and Smith, 2009). The most important

beliefs are perceptions about knowledge and self-efficacy. For instance, when professionals during their career come to see the veterinary knowledge base as stable, their motivation for participation in learning activities will become low. Professional bodies could help sustain perceptions that are supportive for learning by focusing less on the transfer of core knowledge, which adds to the tendency for lifelong learning to evolve into lifelong assessment, and instead speak more about the dynamic nature of veterinary knowledge. When professional bodies desire "to empower learners by exercising more control over them" (Ecclestone, 1999), this will not help veterinary professionals to remain self-directed learners, because internal motivations are more powerful than external motivations (Knowles, 1975).

Likewise, self-efficacy is believed to undergo change across a lifetime and is influenced by life transitions. Employers may help to cross these transitions smoothly by alignment of the provision of support with employees' needs, and tailoring the level of autonomy provided with what the employee can cope with. Gender differences in the need for support and autonomy imply that this alignment must be established by dialog (Mastenbroek *et al.*, 2013). In other domains, studies about transitions and phases of change in a lifetime have been done, but no such work is available for veterinarians.

Workplace

Characteristics of the workplace, such as the level of autonomy, can help or hinder the further development of LLL competencies (Mastenbroek *et al.*, 2014). Even though workplaces in turn are influenced by larger developments in society, such as economic trends, we will restrict ourselves to the level of organizations. Work can provide the social environment that prevents decline or supports an increase in motivation for learning, like the provision of a safe learning environment where making mistakes is allowed. The aforementioned critically reflective learning communities can help. In Box 27.8 a conceivable format for organizing meetings in such learning



Box 27.8: How to run a learning community

A conceivable format for organizing a meeting in learning communities is the following:

- Agree on who will be the moderator and (re)confirm agreements about the way in which this group wants to discuss and work (5 minutes)
- Make an inventory of participants' learning issues for this meeting and choose what issue(s) will be discussed. (Time depends on group size, but no longer than 15 minutes)
- Problem owner (presenter) tells (part of) a problematic event from their own practice. Relate only what actually happened, not how you interpreted the events (5 minutes)

In learning communities focusing on discussing case reports:

- Each of the participants asks questions to come to grips with the problem (10 minutes)
- The moderator may ask whether other participants have experienced the same kind of problem, how they dealt with the problem, and why that approach was chosen (10 minutes)
- Is sufficient knowledge available within the group to solve this problem, in particular to

reach an evidence-based – and feasible – solution?

- If not, what can be done to find sufficient knowledge? Agree on follow-up
- Reflection on the process: What went well? What is open to improvement? To begin with, the moderator gives feedback; in time, the learning community could use an observer from their group
- In learning communities focusing on competencies for professional development:
- Participants ask open questions for clarification. Be alert to closed questions, or hidden suggestions or solutions
- When participants have enough information and understanding of the situation and the presenter's dilemma, both the presenter and other participants reflect on the approach that was chosen and the possible alternatives that they can see or would explore. The presenter notes down the options
- The presenter reacts to the given advice, indicating what is appealing and what is not
- The presenter decides on what might be a first step to take

communities is outlined. Potentially, participation in such communities will affect perceptions about the knowledge base in the veterinary field. Professional bodies could support LLL through facilitating knowledge networks and, since one of the factors that hinders LLL is a lack of time, professional bodies could also contribute by means of easy access to the literature.

Challenges in Facilitating the Development of Lifelong Learning Competencies

To address reflective practice and SDL, and the assessment thereof, within the curriculum

is not simple (Tummons, 2011). For educators who have acquired didactic skills within knowledge-heavy and assessment-driven curricula (May, 2008), shifting to a curriculum aimed at developing LLL competencies is a tremendous change. Such changes ask for faculty development, for design of curricula that leave room for authentic learning experiences, and for close alignment of developments within the curricula with the work of professionals. The latter is necessary because implementing authentic learning designs poses a challenge when students see differences between the ideals promoted in the curriculum and behavior observed in the workplace. In addition, such

new formats may be resource intensive and require innovative logistics, such as have been described for problem-based learning within veterinary medicine (Hyams and Raidal, 2013).

Finally, even though different levels of reflection have been demonstrated in practice, higher levels of reflection are less frequently identified and appear to be more difficult to achieve. This resembles what has been found in different domains for higher-level learning competencies in general, where it has been said that even with the most optimal curriculum, many students will not attain these higher-level learning

competencies (Kegan, 2009; Hofer and Pintrich, 2002).

Conclusion

For veterinarians to be effective lifelong learners, they have to start in veterinary school by taking responsibility for their own learning processes and outcomes. Veterinary schools may support these processes and prevent "growing pains" by offering opportunities for self-directed learning and reflective practice.

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