Evelyn Steinberg[1], Takuya Yanagida[2] & Stephan Marsch[3]

Evaluation of workplace learning from an educational psychology perspective

Abstract

This study pursues a learning-centered evaluation approach in higher education. Grounded in the theory of self-regulated learning, this study aimed to evaluate students' learning processes in a workplace-based course. 188 veterinary students completed the single-item version of the Workplace Learning Inventory in Health Sciences Education. The participants reported frequent use of cognitive learning strategies and moderate use of monitoring and control strategies in the performance phase, as well as partial use of cognitive strategies in the forethought- and reflection phase. They were motivated and experienced positive emotions and a supportive environment. The evaluation provides differentiated insights into the students' learning and concrete starting points for improving workplace learning.

Keywords

educational psychology, self-regulated learning, workplace learning inventory in health sciences education, evaluation

1 Corresponding Author; University of Veterinary Medicine, Vienna; evelyn.steinberg@vetmeduni.ac.at; ORCID 0000-0001-5464-3675

2 University of Veterinary Medicine, Vienna; takuya.yanagida@vetmeduni.ac.at; ORCID 0000-0001-9052-4841

3 University of Veterinary Medicine, Vienna; stephan.marsch@vetmeduni.ac.at ORCID 0000-0002-7322-8335

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Evaluation des Lernens am Arbeitsplatz aus bildungspsychologischer Perspektive

Zusammenfassung

Diese Studie verfolgt einen lernzentrierten Evaluierungsansatz. Basierend auf der Theorie des selbstregulierten Lernens war es das Ziel, die Lernprozesse der Studierenden der Veterinärmedizin in einem arbeitsplatzbezogenen Kurs zu evaluieren. 188 Studierende füllten die Single-Item-Version des Inventars zum Lernen am Arbeitsplatz in der gesundheitswissenschaftlichen Ausbildung aus. Die Studierenden berichteten, kognitive Lernstrategien in der Leistungsphase häufig und Überwachungs- und Kontrollstrategien sowie Vorausplanungs- und Reflexionsstrategien moderat einzusetzen. Sie waren motiviert, fühlten sich gut und erlebten ein unterstützendes Umfeld. Die Evaluation liefert differenzierte Einblicke in den Lernprozess und konkrete Ansatzpunkte zur Verbesserung des Lernens am Arbeitsplatz.

Schlüsselwörter

Bildungspsychologie, Selbstreguliertes Lernen, Inventar zum Lernen am Arbeitsplatz in der gesundheitswissenschaftlichen Ausbildung, Evaluation

1 Introduction

Evaluations of higher education are essential for maintaining high educational standards, and higher education institutions are obliged to undertake quality assurance and quality development activities (Goldie & Morrison, 2013; Standards and Guidelines for Quality Assurance in the European Higher Education Area, 2015). While instruments developed by the university itself are often used to evaluate courses, we argue in favor of basing the evaluation on psychological theories and using scales and items whose psychometric qualities have been tested in psychological research. Furthermore, after the shift toward competence-based higher education and student-centered learning (Bergsmann et al., 2015; Brauer, 2021) we argue in favor of evaluating student learning rather than teaching. In this study, we aimed to evaluate student learning in the course "Clinical Rotation" at the University of Veterinary Medicine, Vienna. The study illustrates the potential of using the theory of self-regulated learning (SRL) and the Workplace Learning Inventory in Health Sciences Education for evaluation purposes.

1.1 Quality management and evaluation in higher education

Quality management is an integral part of higher education and is often driven by legal requirements (Kleijnen et al., 2013; Standards and Guidelines for Quality Assurance in the European Higher Education Area, 2015) and quality assurance agencies' reviews (EQAR; 2024). Quality management frameworks differ between institutions but often include regularly used evaluation instruments, such as course evaluation or examination evaluation, and regularly or unregularly used module or curriculum evaluation tools (Bergsmann et al., 2018; Bergsmann et al., 2015; Goldie & Morrison, 2013). The objective of evaluation is to furnish information regarding the efficacy of programs, with a view to optimizing outcomes, quality and efficiency (Spiel et al., 2015). In competence-based higher education, where student learning takes center stage, evaluation from a student-centered perspective aims to provide insights into the learning process to enhance student learning and maximize academic achievement.

Evaluation instruments are often tailor-made within higher education institutions but there are also established standardized instruments available to evaluate academic and non-workplace teaching (Sullivan et al., 2024). These instruments often evaluate teachers and their teaching. However, the European higher education field has shifted from teacher-centered to learner-centered higher education (Bergsmann et al., 2015; Tam, 2014) and instruments to evaluate student learning processes are needed. Additionally, the increased use of technology in higher education and the topic of learning analytics promote the evaluation of student learning. Learning analytics aims to transform learning data into meaningful insights, empowering students to better understand their own learning and enabling educators to make informed, evidence-based interventions to enhance teaching and learning (Banihashem et al., 2022). A targeted combination of technology generated tracing data and purposefully gathered questionnaire data, using established and validated instruments, could significantly advance the field.

Established instruments for evaluating undergraduates' workplace learning are particularly rare. In competence-based higher education, where not only knowledge but also skills are trained, workplace learning is crucial. For example, in the context of health sciences students' workplace learning (e.g. internships, practical year, clinical rotations) the instruments often focus on evaluating the learning environment (e.g., social and physical environments) rather than student learning (Isba, 2013; Roff & McAleer, 2017). The Workplace Learning Inventory in Health Sciences Education can complement existing instruments, as it focuses on the practical part of health sciences education and evaluates student learning rather than the learning environment.

1.2 Workplace learning

Undergraduate students face a more complex environment during workplace learning than during academic or pre-clinical learning. They must achieve their learning objectives as well as develop role autonomy, join the community of practice, and interact with patients (Cruess et al., 2018; Morris & Behrens, 2013). Many students

face challenges during this transition and require support (Westerman & Teunissen, 2013). Evaluations can help determine the optimal starting points for supporting students during the transition phase.

From an educational psychology perspective and based on the theory of SRL, workplace learning can be divided into four areas, i.e., *cognition*, *motivation*, *emotion*, and *context* (Pintrich, 2004), on two levels—the learning process level and metalevel (Boekaerts, 1997; Steinberg et al., 2024a; Wirth et al., 2020). At the learning process level, students ideally use learning strategies to process information and acquire new skills (*cognition*), are motivated (*motivation*), feel good (*emotion*), and perceive a supportive learning environment (*context*). At the metalevel, students regulate their learning processes in such a way that they can achieve their learning goals. They monitor whether their learning strategies, motivation, emotions, and perceptions of the context help them achieve their goals (*monitoring*). When problems arise, they take action to resolve them (*control*). This component-based perspective of SRL in the workplace is illustrated in Figure 1:

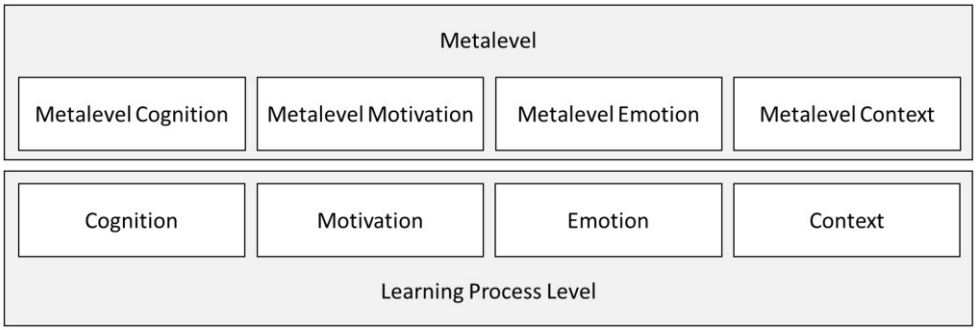


Fig. 1: The eight components of self-regulated learning at the workplace (authors' own illustration)

From the process-based perspective of SRL, learning phases can be distinguished (Zimmerman, 2008). In the forethought phase, the ideal learner prepares, plans, and addresses motivation and beliefs. In the performance phase, an ideal learner uses

appropriate learning strategies, remains motivated, and regulates emotions and aspects of the learning environment. In the reflection phase, they consolidate, reflect, and respond to their performance. Considering both perspectives in combination, using motivation as an example, students need to expect success in the forethought phase, goal situational interest in the performance phase, and self-esteem-enhancing attribution of success or failure in the reflection phase. Students who engage in self-regulated learning have been shown to achieve better academic results (Dörrenbächer & Perels) and less stress (Marsch et al., 2024).

Medical students use a diversity of SRL strategies (van Houten-Schat et al., 2018). At the same time microanalytic assessment showed a lack of strategic thinking and action during clinical reasoning practice tasks (Cleary et al., 2016). Three types of interventions have been developed to enhance undergraduates' workplace SRL: (1) SRL competency training, (2) phase specific interventions like preparatory or reflection sessions during the semester, and (3) enhancing supervisory quality and the learning environment (Steinberg et al. 2025). Self-regulated learning in the workplace has been shown to be predominantly specific to the situation (Steinberg et al., 2025), indicating that specific interventions are most promising. Learning-centered evaluations can help identify specific problems and provide concrete starting-points for interventions.

1.3 The present study

To identify specific problems and provide concrete starting-points for interventions, we aimed to evaluate student learning in the "Clinical Rotation" course at the University of Veterinary Medicine, Vienna, where the students are learning in the workplace for the first time over an extended period. They are usually in their ninth of twelve semesters and are rotating between 15 workplaces on a weekly basis over the entire semester (see Table 1). The current study is based on a secondary analysis of data collected during the course of the project "Self-regulated learning in medical education".

Companion animal workplaces	anesthesia/diagnostic imaging, surgery, gynecology, internal medicine, emergency, and animal shelter
Equine workplaces	internal medicine, reproduction/anesthesia, first-week and second-week surgery (including diagnostic imaging/anesthesia) and night service
Live-stock workplaces	ruminant care (including gynecology), ruminant medi-cine, pigs, poultry, fish, and pathology

Table 1: Clinical Rotation I Workplaces

Our evaluation questions were:

- *To what extent did students utilize learning strategies?* (Cognition)
- *To what extent were students motivated?* (Motivation)
- *How did students feel?* (Emotion)
- *How did students perceive their learning environment?* (Context)
- *To what extent did students monitor and regulate their learning process?* (Metalevel)

2 Method

2.1 Participants

All 192 students in the "Clinical Rotation" course participated in this study. Three students did not consent to their data being used for research. One participant was excluded from further analysis because of a high proportion of missing values (>50 %), resulting in a final sample of n = 188 (80.3 % female, 15.4 % male, 0 % diverse, 4.2 % no response; age range: 21–39 years, M = 24.60, SD = 2.92).

2.2 Measures

We included previously tested single items derived from the Workplace Learning Inventory in Health Sciences Education as well as items from the Medical Emotion Scale (see Table 2; Steinberg et al., 2024a; Steinberg et al., 2024b; Duffy et al., 2018). The Workplace Learning Inventory addresses all eight components of workplace learning identified in Figure 1 and provides a collection of short scales. The single-items were chosen based on content and factor loadings (for details please see Steinberg et al., 2024b):

Table 2: Scale/Single-item measures per component and item-examples

Component / *Sub-component* / Name of scale/single-item	Itemexample		**Reliability** ω **of single-items**	Daily or weekly item
	Single-item – English (back- and forth translation)	Single-item – German (original)		
Cognition				
Cognitive learning strategies			ω = .70 to .84, except 'Consolidation' with ω = .67*	Daily
Preparation; Attention; Rehearsal; Elaboration; Clarification; Consolidation	Before I came to the workplace, I worked to acquaint myself with relevant topics.	Bevor ich in die Klinik bzw. in den Betrieb kam, habe ich mich in relevante Themen eingearbeitet.		
Proximal metacognitive learning strategies			ω = .70 to .75 ('Review' was deleted due to insufficient reliability)	Daily
Planning; Reflection	Before I came to the workplace, I thought about what medical cases I could expect.	Bevor ich in die Klinik bzw. in den Betrieb kam, habe ich überlegt, welche medizinischen Fälle mich erwarten.		

Motivation			ω = .74 to .83	Weekly
Expectancy of success; Situational interest; Mastery goal approach; Performance goal approach; Effort; Attention control; Proactive attitude	I am confident that this week I will be able to do what is asked of me.	Ich bin zuversichtlich, dass ich diese Woche das, was gefordert wird, umsetzen kann.		
Emotion (based on the Medical Emotion Scale)			See Duffy et al. (2017)	Weekly
Negative emotion				
Anxiety; Frustration; Anger; Sadness	Please think about how you felt this week. To what extend were you anxious?	Bitte denken Sie daran, wie Sie sich diese Woche gefühlt haben. Inwieweit waren Sie ängstlich?		
Positive emotion				
Pride; Joy; Hope; Curiosity	Please think about how you felt this week. To what extend were you proud?	Bitte denken Sie daran, wie Sie sich diese Woche gefühlt haben. Inwieweit waren Sie stolz?		

Context			ω = .72 to .81 except 'Supervisory Quality' with ω = .69* and 'Peer Support' with ω = .67*	Weekly
Organizational framework conditions; Supervisory quality; Staff support; Peer support; Equal treatment	Please think about this week: I had the impression that the clinic / facility was well-organized, so that students encountered good contextual conditions.	Bitte denken Sie an diese Woche: Ich hatte den Eindruck, dass die Klinik bzw. der Betrieb gut organisiert war, so dass Studierende gute Rahmenbedingungen vorfanden.		
Metalevel cognition				Weekly
Monitoring cognition; Control cognition	This week I paid attention to whether my studying and practicing behavior would help me reach my goal.	Diese Woche habe ich darauf geachtet, ob mein Lern- und Übungsverhalten zielführend ist.	Monitoring ω = .75 Control ω = .64**	
Metalevel motivation				Weekly
Monitoring motivation; Control motivation	This week I paid attention to how motivated I am.	Diese Woche habe ich darauf geachtet, wie motiviert ich bin.	Monitoring ω = .72 Control ω = .70	
Metalevel emotion				Weekly
Monitoring emotion; Control emotion	This week I reflected on my feelings while studying and practicing.	Diese Woche habe ich über meine Gefühle beim Lernen und Üben nachgedacht.	Monitoring ω = .88 Control ω = .66*	

Metalevel context				Weekly
Monitoring context; Control context	This week I reflected on what contextual conditions[a] accompany my studying and practicing. [a](organisational conditions, instructors, other students, onsite staff, equity concerns)	Diese Woche habe ich darüber nachgedacht, welche Rahmenbedingungen[a] mein Lernen und Üben begleiten. [a](organisatorische Rahmenbedingungen, Lehrende, Mitstudierende, Team vor Ort, Gleichbehandlung)	Monitoring ω = .83 Control ω = .66*	

Note: All items were administered using a five-point Likert scale with *1 = does not apply at all*, *2 = does not apply*, *3 = partly applies*, *4 = applies*, *5 = fully applies;* for the control scale at the metalevel also *6 = The case did not occur;* except for the component emotion with *1 = not at all; 2 = a little; 3 = moderately; 4 = fairly; 5 = very much*. +Reverse coded. The English translation is based on a back- and forth translation of two different persons as it is recommended for translating questionnaires. * Reliability was considered as minimally acceptable according to DeVellis (2016). ** Item was kept due to completeness but needs careful interpretation. The table is based on Steinberg et al. (2024b). For more detailed information on the definition of the scales we refer the interested reader to Steinberg et al. (2024a).

2.3 Procedure

During the 2021–2022 winter semester, data was collected as a daily student task to accomplish the learning goal of "reflecting on one's own learning and practice". Hence, students evaluated their own learning and practices in each of the 15 workplaces. The online survey tool Unipark (EFS Survey, 2022) was used for data collection. Participants who failed to complete their diaries were reminded on the same day. In addition, the project team contacted student representatives to identify the reasons for missing data and provided assistance to resolve issues. For further information on the method (participants, measures and procedure, we refer the interested reader to Steinberg et al., 2025).

3 Results

The study findings represent all students and workplaces. In the following we summarize the results in the order of the evaluation questions (see also Table 3 and Figure A to E). Students reported using various learning strategies (cognition), primarily those utilized while being at the workplace (i.e., attention, rehearsal, elaboration, and clarification) and on a moderate level those used before and after being at the workplace (i.e., preparation, planning, consolidation, and reflection). For motivation, students reported high levels of effort, proactive behavior and mastery approach. They reported moderate levels of performance approach, expectancy of success and situational interest and a moderate to low level of attention control. For emotions and more specifically for positive emotions, students reported high levels of curiosity and moderate levels of pride, happiness, and hope. With respect to negative emotions, students reported feeling only slightly anxious, angry, and sad, while frustration was the most prevalent negative emotion. Students perceived a good learning environment (context), they reported teacher, peer, and staff support, as well as equal treatment, regardless of gender. Furthermore, students reported that the clinic/facility

was well-organized in terms of providing them with good contextual conditions, albeit to a lesser extent than the other factors. With respect to monitoring and regulation strategies (metalevel), students reported moderate utilization of those strategies.

Table 3: Descriptive statistics

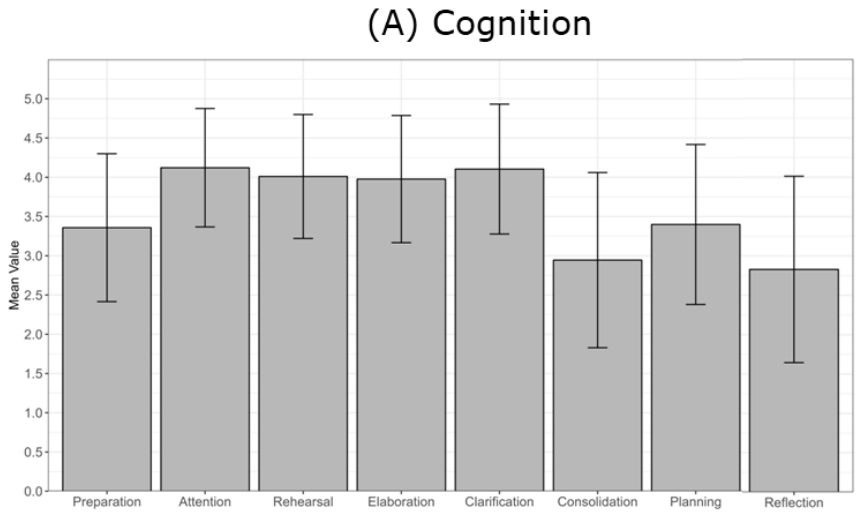
SRL Part	SRL Aspect	n	M	SD
Cognition				
Cognitive learning strategies	Preparation	2730	3.36	0.94
	Attention	2730	4.12	0.75
	Rehearsal	2730	4.01	0.79
	Elaboration	2730	3.98	0.81
	Clarification	2730	4.10	0.83
	Consolidation	2690	2.94	1.12
Proximal metacognitive learning strategies	Planning	2730	3.40	1.02
	Reflection	2690	2.83	1.18
Motivation				
	Expectancy of success	2548	3.68	0.94
	Situational interest	2617	3.68	1.03
	Mastery approach	2617	4.08	0.97
	Performance approach	2617	3.66	1.14
	Effort	2617	4.17	0.89
	Attention control	2617	2.35	1.05
	Proactive attitude	2617	4.22	0.87

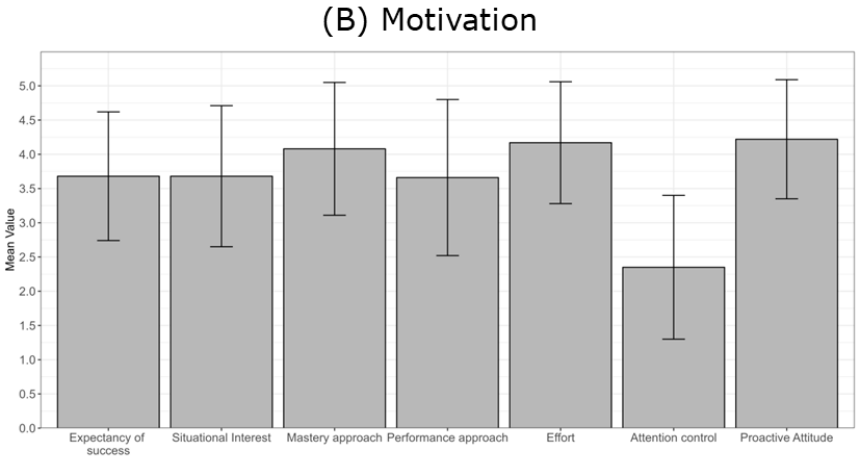
Emotion				
Positive emotion	Proud	2619	2.93	0.97
	Happy	2619	3.08	0.93
	Hopeful	2619	2.91	0.96
	Curious	2619	3.70	0.98
Negative emotion	Anxious	2619	2.17	1.06
	Frustrated	2619	2.60	1.16
	Annoyed	2619	2.32	1.08
	Sad	2619	2.00	1.07
Context				
	Organizational framework conditions	2613	3.51	1.04
	Supervisory quality	2613	3.87	0.99
	Staff support	2612	4.10	0.97
	Peer support	2614	4.53	0.81
	Equal treatment	2604	4.68	0.73
Metalevel cognition				
	Monitoring	2616	3.15	1.30
	Control	1496	2.66	1.26
Metalevel motivation				
	Monitoring	2616	2.95	1.32
	Control	1687	2.55	1.22
Metalevel emotion				
	Monitoring	2615	2.51	1.33

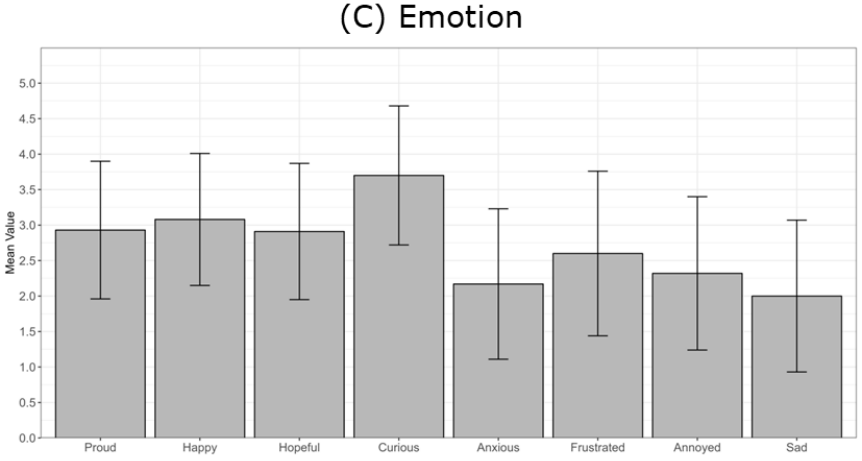
	Control	1679	2.54	1.18
Metalevel context				
	Monitoring	2615	3.20	1.34
	Control	1795	2.76	1.20

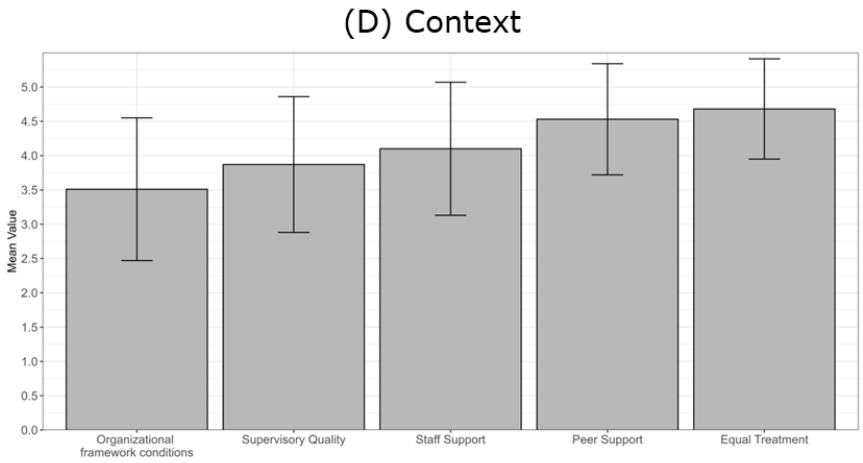
Note: *n* represents the number of measures; each of the 188 students was asked to evaluate 15 workplaces; *n* is lower for control scales, as students could declare if this case did not occur.

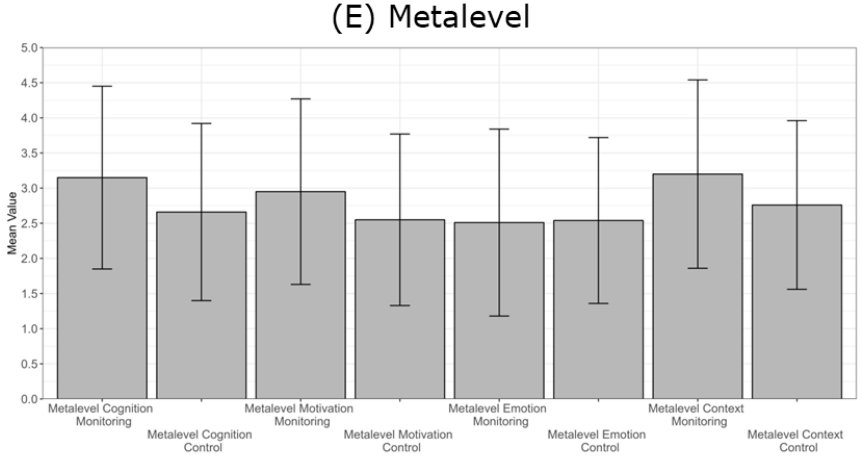
Fig. A to E: The overall evaluation results per component




(B) Motivation
Mean Value
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Expectancy of success
Situational Interest
Mastery approach
Performance approach
Effort
Attention control
Proactive Attitude


(C) Emotion
Mean Value
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Proud
Happy
Hopeful
Curious
Anxious
Frustrated
Annoyed
Sad


(D) Context
Mean Value
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Organizational framework conditions
Supervisory Quality
Staff Support
Peer Support
Equal Treatment


(E) Metalevel
Mean Value
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Metalevel Cognition Monitoring
Metalevel Cognition Control
Metalevel Motivation Monitoring
Metalevel Motivation Control
Metalevel Emotion Monitoring
Metalevel Emotion Control
Metalevel Context Monitoring
Metalevel Context Control

4 Discussion

Health sciences students may encounter difficulties when first learning in a clinical setting, and evaluations can be useful in identifying students' support needs. This study evaluated workplace learning among undergraduate veterinary students based on the theory of self-regulated learning. The following sections discuss the results of the evaluation and provide recommendations for enhancing workplace learning from an educational psychology perspective. Furthermore, we discuss using the Workplace Learning Inventory for evaluative purposes.

4.1 Evaluation of workplace learning

In the following we discuss the results in the order of the evaluation questions. Furthermore, because the aim of evaluation from a student-centered viewpoint is not only to assess but also improve the quality of the students self-regulated learning resulting in better learning outcomes, we add recommendations and practical implications from an educational psychology perspective.

The results on cognition at the learning process level showed that the students employed the learning strategies used before and after being at the workplace less frequently than those relevant in the workplace. Several reasons could explain this result. Students have more freedom to decide whether to apply learning strategies before or after being at the workplace. Thus, some students may choose not to adopt these strategies, because of the lack of time, resources, or motivation (Westerman & Teunissen, 2013). Further, some students could be unaware that these strategies were an important part of the learning process, while others struggled to determine the most effective ways to prepare, plan, consolidate, and reflect (Boekaerts, 1997; Pintrich, 2004; Zimmerman, 2008). In some instances, preparation and planning can be challenging when it is unclear which patients and medical cases the students should expect, and hard to consolidate and reflect when one is exhausted (Morris & Behrens, 2013; Westerman & Teunissen, 2013).

It is recommended that teachers communicate the importance of the forethought and reflection phases to students (Zimmerman, 2008) and discuss effective ways to implement the respective learning strategies (Dörrenbächer & Perels, 2016). Furthermore, course designers can actively include all phases of SRL in the course—for example, by planning a short session at the beginning and end of a shift or by actively assigning forethought and reflection tasks to students.

For motivation at the learning process level, students reported high levels of effort and proactive behavior. Regarding goal orientations, students reported that it was highly important to them to learn new things but that it is also important to them to learn exactly what the teachers expected from them. They reported moderate motivation for some aspects: Regarding expectancy of success this finding could be explained by too challenging tasks, students underestimating one's competence, or feeling inadequately prepared (Morris & Behrens, 2013; Westerman & Teunissen, 2013). Regarding moderate situational interest, students may not have found all tasks equally interesting because of varying individual interests in different disciplines or species (Renninger & Hidi, 2011). Furthermore, students reported moderate to low attention control (in the area motivation). Because the levels of attention (in the area cognition) were rather high, it can be assumed that students stayed attentive and did not need to control attention.

Students reported moderate to high levels of positive emotions with curiosity being especially prevalent and moderate to low levels of negative emotions with frustration being especially prevalent. It is an inherent aspect of the learning process that learners may experience frustration. Another explanations for the moderate level of frustration could be lack of knowledge, inadequate preparation, excessively challenging learning tasks, high cognitive load, or an adverse learning environment (e.g., issues with educators, clinical personnel, patients, or peers) (Isba, 2013; Morris & Behrens, 2013; Roff & McAleer, 2017; Westerman & Teunissen, 2013; Wirth et al., 2020).

Recommendations to overcome motivational and emotional challenges include discussing the causes of motivational problems and emotional challenges with the stu-

dents and teachers (Dörrenbächer & Perels, 2016). Thus, allocating time and providing opportunities for teachers and students to express their motivational and emotional challenges is essential and allows both parties to explore possible solutions. Reflection sessions may be conducted as part of a course or on an individual day. Additionally, focus groups with teachers and students can be implemented to find out the best intervention before developing or altering the course structure.

Students perceive the learning environment as supportive. It is recommended to identify the factors that lead to good results and to maintain good framework conditions even if staff or course design changes. Moreover, to further improve student motivation and positive emotions, students and teachers should deliberate on specific organizational framework conditions that can be improved, such as suitable workloads, ample time for preparation and reflection, a sufficient number of patients and learning opportunities, computer workstations that provide access to pertinent literature and patient records, and designated breakrooms (Isba, 2013; Roff & McAleer, 2017).

With respect to the metalevel, students reported partial usage of monitoring strategies and even lower usage of control strategies. This finding could be attributed to several factors. First, like the less utilized cognitive strategies, students may not have had time, resources, or motivation to use metalevel strategies since they may be facing a high workload or experiencing a high cognitive load (Morris & Behrens, 2013; Westerman & Teunissen, 2013; Wirth et al., 2020). Furthermore, some students could have been uninformed that these strategies were crucial for effective and efficient learning, while others may lack the knowledge necessary to implement monitoring and control strategies (Boekaerts, 1997; Pintrich, 2004; Zimmerman, 2008). Additionally, research has shown that students sometimes use these strategies without realizing them. Therefore, students could have unconsciously employed these strategies, resulting in their under-reported usage (Wirth et al., 2020).

It is recommended to discuss monitoring and control strategies explicitly with students and teaching them the importance of these strategies in promoting successful

SRL and professional development (Dörrenbächer & Perels, 2016). Course designers might consider including a session on the learning process and metalevel strategies for regulating it, as well as regular sessions for teachers and students to reflect on the learning goals and process.

4.2 Strengths and limitations

To evaluate workplace learning, we utilized the Workplace Learning Inventory, which is specific to the practical part of health sciences education and focuses on evaluating student learning and not just on the learning environment (Steinberg et al., 2024a). The psychometric qualities of its scales and single items are known Steinberg et al., 2024b). Additionally, almost the entire cohort of students participated, representing a diverse range of learners, including high achievers and struggling students. One study limitation was the use of single items that did not cover all aspects of the psychological construct (Steinberg et al., 2024a). In addition, some items were administered on a weekly basis, whereas others were administered daily. This study design was necessary to gather intensive longitudinal data for the original study. To avoid overburdening participants in evaluation settings, we recommend administering each item once per workplace (e.g., weekly in case of weekly changing workplaces). Finally, in this study we presented the overall results for the entire course but not the workplace-specific results, owing to confidentiality. We recommend providing decision-makers at each workplace with the respective results. Delivering workplace-specific results can help facilitate more targeted interventions (Steinberg et al., 2025).

4.3 Practical implications

The Workplace Learning Inventory in Health Sciences Education can be used as an evaluative tool in an (1) instrumental, (2) conceptual/enlightening or (3) legitimizing way (Vedung, 2000). First, its results may enhance workplace learning by implementing strategic measures, for example by implementing the recommendations mentioned above. A pre-post comparison through a follow-up assessment after the

intervention can determine its effect. Second, by evaluating and disseminating the findings, a deeper comprehension of the workplace learning processes can be achieved by a range of stakeholders. For instance, students and educators can acquire an understanding of various components of the learning process and potentially utilize this knowledge to enhance their teaching and learning outcomes. Thirdly, higher education institutions must conduct evaluations to fulfill accreditation standards, as previously mentioned. Therefore, workplace learning evaluations using the Workplace Learning Inventory scales or single items can be utilized to demonstrate the quality of workplace learning courses.

In addition to evaluations, it should be explored, whether the Workplace Learning Inventory scales or single items can be utilized in teaching and learning analytics (Banihashem et al., 2022) or precision medical education (Triola & Burk-Rafel, 2023). Stakeholders could benefit from instant access to automatically generated feedback and implement short-term measures for improvement.

4.4 Conclusion

This study evaluated the practical part of health sciences education based on the theory of self-regulated learning (SRL) using established single-items derived from the Workplace Learning Inventory in Health Sciences Education. It demonstrated the potential of using a psychological theory and instrument for evaluation purposes at higher education institutions. The theory of self-regulated learning provides a differentiated view on learning processes and the Workplace Learning Inventory a reliable and valid assessment of the different learning aspects. In contrast to teaching-centered or satisfaction-focused evaluation approaches, this learning-centered evaluation approach presents a deep insight into student learning and starting points for improvement of workplace learning and teaching. This study should encourage evaluators to use psychological theories and instruments, to focus on student learning and promote evidence-based teaching and learning in the practical part of higher education.

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