

# Transforming first-aid training: a new lesson study approach for the Red Cross

Lesson study  
for Red Cross  
first-aid  
training

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## Abstract

**Purpose** – The first-aid courses organized by the Youth Red Cross Carinthia (Austria) had a quality problem, necessitating a professionalization in teaching and time structure. This research aimed to enhance the quality and effectiveness of these courses by implementing modified lesson studies with non-professional trainers. The paper presents the realization process, empirical research and results obtained by applying the first-aid curriculum.

**Design/methodology/approach** – Around 22 lesson study first-aid courses (14 classes with 2 cycles, 8 with 3 cycles) were conducted and evaluated in different Austrian school types. An observation sheet was created to evaluate attention and competencies. Interviews were conducted with both teachers and students to validate the results.

**Findings** – The research findings demonstrate that lesson studies can significantly enhance the quality and effectiveness of first-aid courses. Inexperienced and experienced first-aid teachers significantly improved their teaching skills. Newly educated first-aid teachers showed substantial improvement, leading to the introduction of an induction period and coaching opportunity within the Youth Red Cross Carinthia.

**Originality/value** – This is the first lesson study conducted in a non-academic context. It highlights the adaptation process of Carinthian first-aid courses. It illustrates how lesson studies impact lesson clarity, instructional variety, student engagement in the learning process, student outcome, student feedback and teaching effectiveness in a non-academic context. It contributes to the literature on the application of lesson study in first-aid education and provides insight into the benefits of this approach in enhancing the quality of first-aid training.

**Keywords** First aid, Professionalization, Lesson study with non-academic trainers

**Paper type** Case study

## Introduction

Within the realm of professional development, lesson study has emerged as a powerful tool for educators in different countries and contexts (e.g., Aas, 2023; Taylor *et al.*, 2019; Vermunt *et al.*, 2019). It provides a structured framework for teachers to work together, share expertise and refine their instructional methods. Lesson study allows educators to tailor their teaching to the specific needs of their students. In the context of professional development, lesson study is not merely a one-time training event but a continuous cycle of improvement, promoting a culture of lifelong learning among educators (Chen, 2019; Chen and Chan, 2021; Wood, 2018).

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While lesson study has predominantly been explored in school contexts, its potential extends beyond traditional educational settings, including corporate and organizational environments. However, there is almost no research on lesson studies in non-academic or health-related contexts outside of schools. With our case study, we seek to start filling this blank spot in lesson study research. We present and discuss a lesson study used as a professional development model in a non-academic setting, namely in first-aid courses of the Red Cross.

The Red Cross and Red Crescent Movement consider first-aid training a vital act of humanity that empowers communities to care for themselves and others. The Youth Red Cross provides First-aid training in various educational institutions. However, where this study took place in Austria, the training program lacks consistent didactical approaches, resulting in inexperienced first-aid trainers facing difficulties in time planning and confidence (Austrian Youth Red Cross, 2017). With this case study, we aimed to assist first-aid teachers by implementing collaborative teaching based on lesson study, facing two significant challenges. First, inexperienced first-aid teachers struggle with transferring their knowledge effectively during courses despite being well-educated. Second, experienced teachers conduct only a few courses per year, which can lead to a deterioration in the quality of their didactical knowledge without regular revision. Using lesson study, we hope to meet these challenges. We opted for lesson study as our methodology because, at the time, the first author was instructing teacher students in lesson study. Furthermore, the co-author, serving as both a teacher-student and a Red Cross trainer, identified the potential of lesson study in addressing challenges faced by the Red Cross training.

## Background

The Youth Red Cross Carinthia introduced a coaching system in 2018 to address these issues, but it had room for improvement (Schober, 2020). The coaching system had shortcomings due to the absence of defined objectives and guidelines for teachers, which led to a lack of constructive feedback for first-aid teachers being coached. First Aid teachers often worked without specific instructions, hindering their ability to support new first-time teachers effectively. Furthermore, a lack of efficient communication between the organizational team and the teaching team about the training process was reported, and the coaching system did not provide a systematic approach to the needs of a “good” coach. This problem is not a local but an international one (Haverkamp *et al.*, 2018). Therefore, our research aimed to create an efficient first-aid coaching system that utilizes lesson study as the developmental research method. The first-aid teachers should be enabled to deal critically and mindfully with their own problems and also be able to communicate knowledge autonomously. Since the courses are about life-saving actions, lesson studies should be planned to bring specific subject matter goals and long-term goals for students to life and to study how students respond to these lessons carefully (Dudley, 2012; Gutierrez, 2015). Our lesson study should help first-aid teachers improve their individual approach to teaching first-aid courses and to achieve a positive and sustainable effect on the quality of first-aid courses.

### *Contents of a red cross training*

Generally, there are three different formats of first-aid courses (16, 8, 4 units). We conducted our lesson study for the 16-unit-long first-aid course. The course contains the following lessons:

- (1) Basic first aid: Basic first aid refers to initial medical assistance given to an injured or ill person before professional help arrives. It includes essential techniques like cardiopulmonary resuscitation, wound care and managing common emergencies.

- (2) Saving lives: This section refers to all emergencies involving life-threatening injuries. It includes the recovery position, chest compression, severe bleeding and the Heimlich maneuver.
- (3) Road accident: First aid at a road accident involves providing immediate medical assistance to individuals involved in a traffic collision. The primary goals of first aid in such situations are to assess the scene for safety, call for emergency medical services and provide initial care to injured individuals.
- (4) Acute emergencies: These emergencies need immediate medical assistance and can be life-threatening. This section includes heart attack, stroke, seizure, diabetes, asthma attack, heat stroke, poisoning and allergic reactions.
- (5) Injuries: This involves providing immediate medical care to individuals who have sustained physical harm or wounds. The primary objectives of first aid in such cases are to assess the injury, prevent further harm or complications and promote the well-being of the injured person until professional medical help arrives.

These courses can generally be structured differently; however, 16-unit courses are mostly divided into two units of eight-eight hours or three units of six-six-four hours. Our lesson study focused on first-aid courses with an eight-hour interval (lesson study 1–14) and six-six-four courses (lesson study 15–22). All in all, first-aid courses contain a high number of repetitions of first-aid practices and strategies.

### **Modification of the lesson study for the first-aid course**

Adapting lesson study to non-academic courses like first-aid coaching poses some specific challenges due to their distinct objectives, audience and learning outcomes. In Red Cross life-saving training, the didactical strategy prioritizes hands-on, practical application of skills. Participants actively engage in realistic scenarios, simulating emergency situations to practice life-saving techniques. This approach includes fundamental elements such as scenario-based learning, where participants encounter various emergency situations, gaining the ability to apply their skills in contexts mirroring real-life scenarios. Moreover, the training embraces experiential learning methodologies, encouraging active participation, problem-solving and critical thinking in high-pressure situations (<https://www.redcross.org/take-a-class/first-aid>). In contrast, the didactical strategy in a normal school context integrates contents and skills into broader subjects. This typically involves theoretical instruction within a classroom setting, with less emphasis on realistic scenarios. In Red Cross life-saving training, the emphasis is on experiential and scenario-based learning for practical application in realistic situations. On the contrary, skills in the normal school context are typically integrated into a broader curriculum, with a more classroom-oriented didactical strategy that aligns with theoretical instruction.

Another notable distinction is that Red Cross trainers are not traditional educators. Their emphasis lies less on didactical principles and more on hands-on training, ensuring that students can proficiently carry out life-saving activities. Unlike in traditional academic settings, for students, first-aid courses lack the same significance; there are no exams to prepare for, and no grades are awarded. Consequently, for students, it is not as serious; they approach it with a more relaxed mindset, almost treating it like play.

A further challenge was the amount of time required for a lesson study, as first-aid coaches are mainly paid on a fee basis and cannot charge for planning, development, or reflection efforts. Therefore, an evaluation method that minimizes time exposure while allowing maximum value from lesson studies was needed. In this context, an adapted reflection methodology and conducting the first-aid courses in a cycle orientation was suggested as a

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more sustainable and valuable approach for first-aid teachers (O'Shea *et al.*, 2014, p. 62). For us, conducting lesson studies was crucial in first-aid courses, as it provides an opportunity to review the teaching methodology, classroom management and teaching material and strengthen didactical, theoretical and diagnostic competencies. Finally, collaborative teams can still benefit from immediate "reflection-in-action" while teaching, and "reflection-on-action" can take place during breaks, transforming their teaching straightaway (Yanow and Tsoukas, 2009, p. 1340; Dudley, 2015, p. 4). For the effective adaptation and concrete application of the lesson study and refinement of our way of access, we conducted a preliminary study.

#### *Preliminary study to support the adaption process*

In the preliminary study, we employed an examination process with four observation points based on the Diagnostic Classroom Observation (DCO) framework by Saginor (2008), which included planning and organization, course conduction, content analysis and analysis of the classroom culture in a first-aid course. Informed by the Opportunity to Learn model (OTL) (Elliott and Bartlett, 2016) we focused on students' achievement in first-aid courses, emphasizing the importance of teaching actions and the classroom environment. The study should grant a well-functioning adaptation of the lesson study concept to first-aid courses. Therefore, we conducted interviews with the head of the department, an experienced first-aid teacher and another first-aid coach to gain an understanding of the Youth Red Cross Carinthia organization, the educational guidelines for first-aid courses, the induction phase standards, training course procedures and the communication between the organization and the coaches. These interviews gave insight into the strengths and weaknesses of the current courses and which goals we should define for our lesson study.

During the observation phase of the running courses, we focused on understanding student learning processes and constructing first-aid knowledge. First-aid teachers and student activities, teacher competencies, teaching processes, learning environments, individual pre-conditions, learning activities and student engagement were noted. The preliminary study clearly explained the differences between student learning in first-aid courses and traditional school contexts. The analysis of the OTL in first-aid courses led to the identification of vital characteristics for effective teaching, including language, motivation, teacher knowledge, learner activities, learner support, quality of tasks, individual learning activities and student outcomes.

Exploring the distinctions between first-aid courses and conventional classroom education, we delved into the special classroom culture of first-aid settings. This analysis underscored the significance of elements like the learning environment, atmosphere, classroom routines, behavior management, student engagement, working relationships and equity. It was found that many of Saginor's aspects of classroom culture were not significantly influential in first-aid courses. Instead, the level of student engagement emerged as a key element for successful student learning. In our preliminary study, we pinpointed four crucial aspects for observing first-aid coaching courses: lesson clarity, instructional variety, student engagement and outcomes. Consequently, our lesson studies specifically centered around these aspects.

#### *Lesson study plan for experienced and inexperienced teachers*

The Youth Red Cross office assembled the lesson study teams. To clarify, the Youth Red Cross office assigned a newly educated first-aid teacher as the "head" teacher to a certain first-aid course. If possible, the team assigned a second teacher for the study lesson. Contrary to usual lesson studies, however, the Youth Red Cross Carinthia beforehand assigns the head teacher – who can be either inexperienced or experienced – to the lesson study group.

Accordingly, two slightly differing planning processes are implemented in the first-aid coaching course procedure (see [Table 1](#)).

### Research questions

In the following section, we elaborate on the research questions. Drawing insights from the preliminary study, a review of pertinent literature, and our expertise in first-aid training and traditional school education, our objective in this study was to address two key inquiries. Generally, the 16-unit courses are divided into two appointed days (eight-eight-hour format), which means that we conducted two cycles with the group. After team reflections, we recognized that a continuous eight-hour session might be too lengthy for first-aid courses. As a consequence, for the last eight lesson studies, we adopted a modified six-six-four format, conducting three cycles with these groups, mainly conducted by inexperienced trainers (see [Table 2](#)).

**First research question:** Do differences emerge in lesson clarity, instructional variety, student engagement and student outcomes between eight-eight-hour (two cycles) and six-six-four-hour (three cycles) courses?

Furthermore, our interest extended to positively influencing teaching effectiveness from cycle to cycle and exploring the potential impact of trainers' experience on outcomes. Given the observed significantly higher teaching effectiveness in courses with experienced head teachers, our hope was that by identifying minor adjustments, the planning procedure adapts from inexperienced to experienced teachers, with a central focus on the reflection process.

**Second research question:** What is the developmental progression in teaching effectiveness and student feedback within the cycles, for both experienced and inexperienced teachers?

### Study design and methods

#### *Process and analysis strategy*

For the lesson analyses, a first-aid coaching team collaborated to plan and construct a lesson plan for a study lesson. This lesson plan was used as a guideline for the head teacher who conducted the study lesson and for the observers who had a printed version of the lesson plan during the observation process. The observers used the lesson plan to determine whether the planned lesson clarity and instructional variety were successfully implemented during the study lesson. For this, each lesson plan was divided into four observation points with a field to enter points regarding lesson clarity and instructional variety ([Table A3](#) in [Appendix 3](#)). Additionally, they rated the behavior of case students (unknown to the head teacher) according to student engagement and student outcome (see [Tables 4 and 5](#) in [Appendix 3](#)). The duration of one observation phase depended on the overall duration of one cycle: two

Step	Study lesson plan for experienced teachers	Study lesson plan for inexperienced teachers
1	Analysis of target group and starting level	Analysis of target group and starting level
2	Determination of goals	Determination of goals
3	Revision of previous teaching approaches, lesson plans and material	Collection of ideas
4	Modification process	Teaching techniques, material, resources and expected student response
5	Lesson plan	Lesson plan

**Source(s):** Table created by authors

**Table 1.**  
Lesson study plans for  
experienced and  
inexperienced teachers

Classes	School type	Students	Age	First-aid teacher	Cycles
1	Regular secondary school	16	12–14	Experienced	2*
2	Regular secondary school	18	12–14	Experienced	2
3	Regular secondary school	20	12–14	Inexperienced	2
4	Academic secondary school	31	14–16	Inexperienced	2
5	Academic secondary school	17	12–14	Experienced	2
6	College for higher vocational education	31	14–16	Inexperienced	2
7	College for higher vocational education	17	16–18	Inexperienced	2
8	College for higher vocational education	33	16–18	Inexperienced	2
9	College for higher vocational education	19	16–18	Experienced	2
10	College for higher vocational education	21	14–16	Experienced	2
11	College for higher vocational education	16	16–18	Inexperienced	2
12	College for higher vocational education	7	14–16	Inexperienced	2
13	Course for teachers (regular secondary school)	12	25–60	Experienced	2
14	Course for teachers (regular secondary school)	12	25–60	Experienced	2
15	Regular secondary school	28	12–14	Inexperienced	3
16	Academic secondary school	31	14–16	Inexperienced	3
17	College for higher vocational education	18	14–16	Inexperienced	3
18	College for higher vocational education	28	14–16	Inexperienced	3
19	College for higher vocational education	14	14–16	Inexperienced	3
20	Regular secondary school	12	12–14	Inexperienced	3
21	Regular secondary school	13	12–14	Inexperienced	3
22	Course for teachers (regular secondary school)	8	25–60	Experienced	3

**Note(s):** School types: We conducted the lesson studies in various school types in Austria between secondary school and high school. \*The first cycle refers to data collected within the preliminary study

**Table 2.**  
Sample and data basis

**Source(s):** Table created by authors

hours in the eight-eight-hour format and one and a half respectively one in the six-six-four-hour format. All statistical analyses were performed with MS Excel, and SPSS data were provided on group mean level.

#### *Data collection on the observer level*

First-aid coaching courses' forms and analysis procedures are designed to be simple yet accurate. The analysis process of individual study lessons in first-aid coaching courses is divided into several factors: analyzing the realization of the lesson plan, the observation sheet, feedback, interviews and other factors.

*Student engagement, student outcome, lesson clarity and instructional variety.* Adapted from Borich (2015, 2017), we used five main categories for scaling. The categories of student engagement and student outcome were divided into five subcategories, and each level was assigned points ranging from one to ten for statistical analyses (Tables 4 and 5 in Appendix 3). We also developed a ten-point scale with descriptors and operationalizations focused on instructional clarity and variety (Table 3 in Appendix 3).

*Instructional success.* Following Mujs and Reynolds (2005), who named the plan and structure of a lesson, variety, pace and student outcome as key features for teaching effectiveness, we focused on instructional variety, lesson clarity and student outcome (O'Leary, 2020, p. 117). To measure teaching effectiveness, we merged the variables of lesson clarity and instructional variety, student engagement and student outcome, as a general term. We tested the satisfying internal consistencies with Cronbach's alpha for all three cycles (cycle 1:  $\alpha = 0.94$ ; cycle 2:  $\alpha = 0.91$ ; cycle 3:  $\alpha = 0.97$ ). Consequently, to gauge overall instructional success, the framework outlined in Tables 3–5 in Appendix 3 served as the foundation for the observation sheet in Appendix 4. The observation sheets were employed to

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track student engagement, student outcome and lesson clarity and instructional variety. Ideally, the coach completed the observation sheet promptly after the conclusion of each phase (observation points).

*Teacher interviews.* Within the preliminary study, we conducted short interviews after every session regarding the following topics: (1) coaching, (2) teaching effectiveness and (3) forecast. Since we realized that these interviews were diverted into a self-protective behavior of a first-aid teacher, we stopped integrating systematic interviews and continued with unmonitored reflective conversations.

#### *Data collection on the student level*

*Feedback sheets for students.* According to expert recommendations (O'Leary, 2020, p. 59; Huxham *et al.*, 2008, p. 1), all students enrolled in the first-aid course were invited to provide anonymous feedback on various aspects that impact the effectiveness of the course immediately following the study lesson. After completing each first-aid training course, students were given feedback forms to gather their opinions and evaluations. We provide these feedback forms in [Appendix 6](#) ([Figure A1](#): 12–14 years, [Figure A2](#): 14–18 years). For data analysis, we calculated overall means.

*Case student interviews.* Additionally, in-depth interviews were conducted with each of the 22 study lessons' five selected case students to assess their engagement, learning experiences, behavior and motivation. This approach aimed to accurately measure and understand specific student behaviors and provide further insights to enhance the interpretation of findings obtained from the observation sheet and feedback forms. Like [Dudley's \(2014\)](#) approach, the interview form for first-aid coaching course study lessons consists of four open questions:

- (1) What did you enjoy most about today's first-aid session?
- (2) Have you learned something new today or can you do something now that you could not do beforehand?
- (3) What aspect of teaching worked worst/best for you?
- (4) If you taught the same session to another group, what would you change? How would you teach differently?

While we did not systematically analyze this verbal feedback, it proved instrumental in deepening our understanding of how students felt during the courses and how they experienced the training situation. Several answers and statements are therefore exemplified in the results section (research question 1).

### **Conducted study lessons**

A total of 22 lesson study first-aid classes were done, comprising 14 classes that conducted two cycles (eight-eight-hour format) and eight classes with three cycles (six-six-four-hour format). The lesson studies were designed, conducted, reflected upon and evaluated by two or more first-aid teachers, with one teacher as the head teacher and the others as observers. The observers completed a prepared observation sheet and actively reflected on student learning, focusing on the lesson plan. [Table 2](#) provides an overview of the data used in this case study. A notable conflation between teachers' experience levels and the frequency of course cycles has been observed at this juncture. Inexperienced teachers tended to conduct courses with three cycles more frequently, while experienced teachers predominantly conducted eight-eight-hour courses with two cycles. This also implies a confusion of both research questions. Nevertheless, we aimed to find answers for both research questions separately and account

for this conflation in interpreting the results. From an organizational perspective, preventing the lesson studies from this conflation was impossible.

After completing a study lesson, interviews with the case students were conducted. Feedback using the feedback sheets (Figures A1 and A2 in Appendix 6) was obtained from all students regarding methodology, motivation, topic and learning climate. The observation sheets and the team's experiences were the basis for the analyses, evaluation and reflections on the course. After every lesson study, the research team evaluated the feedback sheets and adapted their planning processes regarding the outcome. Building upon these findings, study lesson cycle two was planned and conducted using a similar approach. The same procedure was repeated for study lesson three, including its preparation and analyses.

## Results

A total of 22 lesson study first-aid coaching courses were conducted, comprising 14 classes with two cycles and eight classes with three cycles. Due to resource limitations, scheduling constraints and COVID-19, the third cycle was challenging to implement. However, it was possible to conduct the third cycle in cases where teachers did not achieve their desired level and specifically requested further study lessons, or when government restrictions were relaxed.

**First research question:** Do differences emerge in lesson clarity, instructional variety, student engagement and student outcomes between eight-eight-hour (two cycles) and six-six-four-hour (three cycles) courses?

For this research question, we divided data from the 14 classes with two cycles (Figure 1) and eight classes with three cycles (Figure 1) and used all data from all cycles. As Figure 1 shows, performance declined at the end of both course formats was a serious problem, for both teachers and students, especially after the third observation point, unfortunately also for those with the six-six-four-hour format.

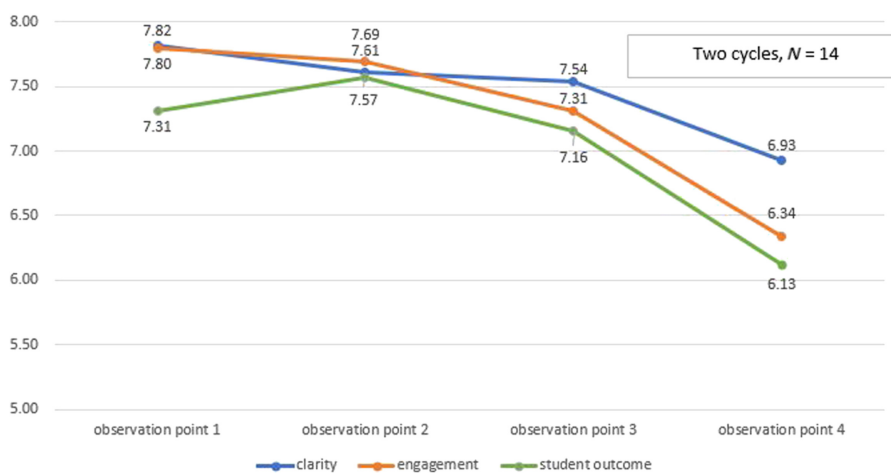
We used a General Linear Model (GLM) with within-subject (observation points 1 to 4) and between-subject design (eight-eight-hour format\*six-six-four-hour format) to check the decrease in significance. For the GLM, we calculated the average of the data collected by five observers for each lesson. We found a significant between subjects main effect ( $F(3, 18) = 30.7, p < 0.001, \text{partial } \eta^2 = 0.836, \text{Wilk's } \Lambda = 0.929$ ) and within subjects main effect ( $F(9, 12) = 10.6, p < 0.001, \text{partial } \eta^2 = 0.888, \text{Wilk's } \Lambda = 0.112$ ) but no main interaction effect. On an univariate level, all three aspects decreased significantly: lesson clarity: ( $F(3, 60.0) = 8.2, p < 0.001, \text{partial } \eta^2 = 0.291$ ), engagement ( $F(1.8, 37.0) = 20.0, p < 0.001, \text{partial } \eta^2 = 0.500$ ) and student outcome ( $F(2.0, 40.1) = 20.0, p < 0.001, \text{partial } \eta^2 = 0.499$ ). One significant interaction effect exists with observation point and experience at clarity ( $F(2.8, 60.0) = 3.9, p = 0.013, \text{partial } \eta^2 = 0.162$ ). The following statements from all parties involved teachers and students – demonstrate their difficulties with the duration of an eight-eight-hour format:

Especially at the end of the course—like the last one or two hours—I had the feeling that not only the students but also I were getting tired and could not focus anymore. It would definitely be more efficient to quit after five or six hours. Eight hours seem too long for all people involved. (Statement First Aid teacher)

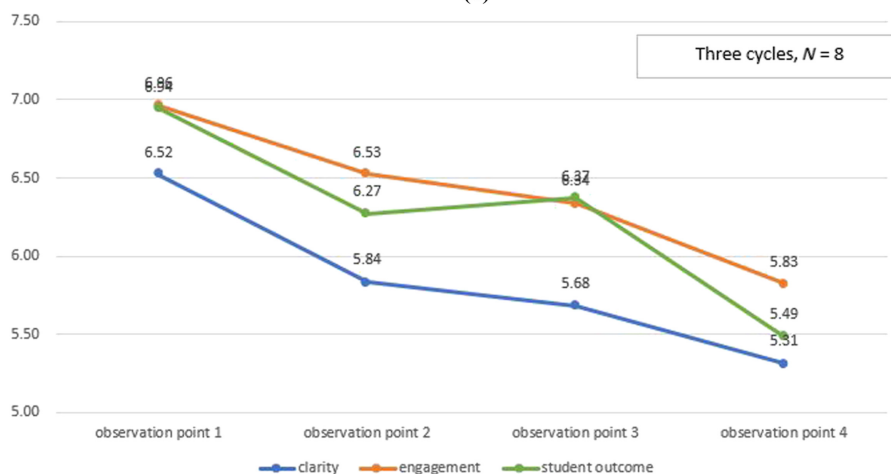
I not only felt tired but also could sense that the students were tired as well. They did not listen any longer and it was impossible to implement new content. I just repeated stuff and did not really use the time effectively. (Statement First Aid teacher)

Throughout the course, I could realize that the whole group interacted and was engaged with the First Aid teacher. However, after the third phase [six hours] I had the feeling that the level of concentration decreased drastically. Students would not listen anymore and the coachee would





(a)



(b)

**Figure 1.** Decrease of lesson clarity, student engagement and student outcome within eight-eight-hour format (Figure 1, N = 14) in comparison to six-six-four-hour format (Figure 1, N = 8)

Source(s): Figure created by authors

make banal mistakes. Overall, I think it would make more sense to quit after six hours; maybe even shorten the 16-unit course to 12 hours with two meetings of six hours each. (Statement First Aid teacher)

I tried to listen, but I got so tired and just could not concentrate any longer. The course was a lot of fun, but I think it could have been shorter. For the last hours I thought we just sat there and waited for it to be over. (Statement Student)

At first it was fun and interesting. But after some time, I was exhausted, was hungry, and wanted to go home. It was too long. (Statement Student)

**Second research question:** What is the developmental progression in teaching effectiveness and student feedback within the cycles, for both experienced and inexperienced teachers?

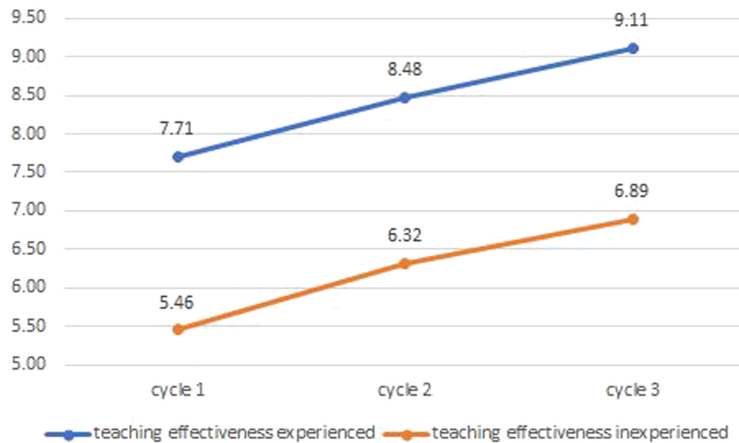
We opted not to conduct statistical analyses for the second research question due to the limited sample size of only eight groups over three cycles. However, we illustrate the progress between the cycles through graphical representation. Figure 2 demonstrates that the experienced trainers exhibited a significantly higher initial level of teaching effectiveness and experienced further improvement over time. Additionally, the inexperienced trainers demonstrated notable improvements in teaching effectiveness, particularly among those who completed a third cycle.

As mentioned above, the subgroups comprising experienced and inexperienced teachers, as well as the course format, exhibit partial overlapping with only one experienced teacher conducting three cycles who can be identified as an outlier in his performance (Figure 2,  $M = 9.11$ ). Consequently, the investigation was further narrowed down to compare teaching effectiveness between courses with two and three cycles. Although teachers with three cycles started on a much lower level of teaching effectiveness, they almost caught those with two cycles ( $M = 7.17$  after three cycles vs.  $M = 7.49$  after two cycles).

Similar trends emerge in the realm of student feedback. Despite commencing at a lower level for courses involving three cycles and inexperienced teachers, students progressively provided more positive feedback to trainers who undertook three cycles ( $M = 7.31$  after three cycles vs.  $M = 7.80$  after two cycles).

#### *Summary of the findings*

The first research question focused on changes in student engagement, student outcome and teaching effectiveness over the eight-eight-hour and the six-six-four-hour format. Observations of first-aid courses revealed that tiredness significantly impacted the results in both formats. Figure 1, statistical analysis and interviews demonstrated that teachers and students experienced difficulties with concentration, participation, listening and proper practice, particularly after the third observation point (Figure 1). As a result, all observed aspects significantly decreased after the third observation point, including student engagement, student outcomes and teaching clarity. Interview statements from teachers



**Figure 2.** Development of the teaching effectiveness within three lesson cycles, comparing the performance of experienced teachers against inexperienced teachers

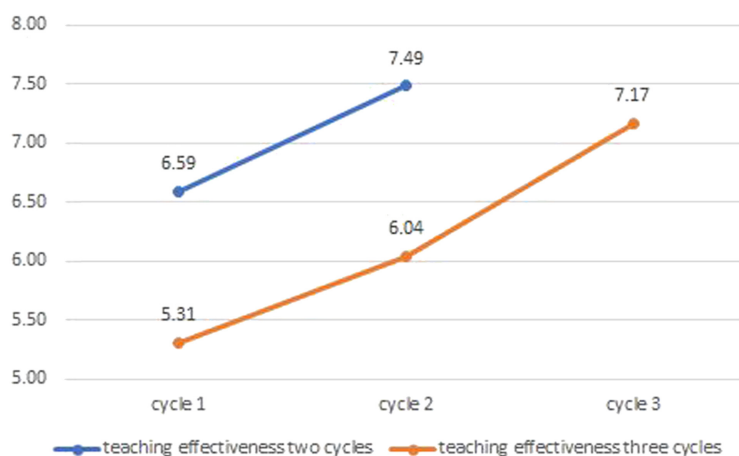
**Note(s):**  $N = 14$  classes had inexperienced trainers (orange),  $N = 8$  had experienced trainers (blue). Only one experienced teacher conducted three cycles

**Source(s):** Figure created by authors

and students further highlighted the challenges associated with the duration of the eight-eight-hour format. Statistical analyses and Figure 1 show that in the six-six-four-hour format (assumed due to the high number of inexperienced teachers) the teaching clarity is not yet fully developed from the first third observation point on. In the future, first-aid lesson studies will help us to control this format-experience problem even better.

The second research question explored the developmental progress during the study cycles on teaching effectiveness, depending on the trainers' training experience. Due to the relatively small sample size of eight groups observed over three cycles, statistical analyses were not conducted for the third research question. However, we visually represented the progress between cycles (Figures 2–4). Our findings indicate that experienced trainers initially possessed a substantially higher level of teaching effectiveness than their less experienced counterparts. The experienced trainers demonstrated continuous improvement in teaching effectiveness over time. However, inexperienced trainers also exhibited notable improvements in teaching effectiveness, but also from the students' perspective, especially among those who completed a third training cycle (Figures 3 and 4). These results suggest that both experienced and inexperienced trainers benefited to a special degree from the lesson study, albeit with differing starting proficiency and improvement rates. Based on this empirical evidence, implementing an additional instruction cycle in the six-six-four-hour format is highly efficacious in augmenting the overall quality of teaching in contrast to the eight-eight-hour format, particularly for individuals who are new to the field or subject matter.

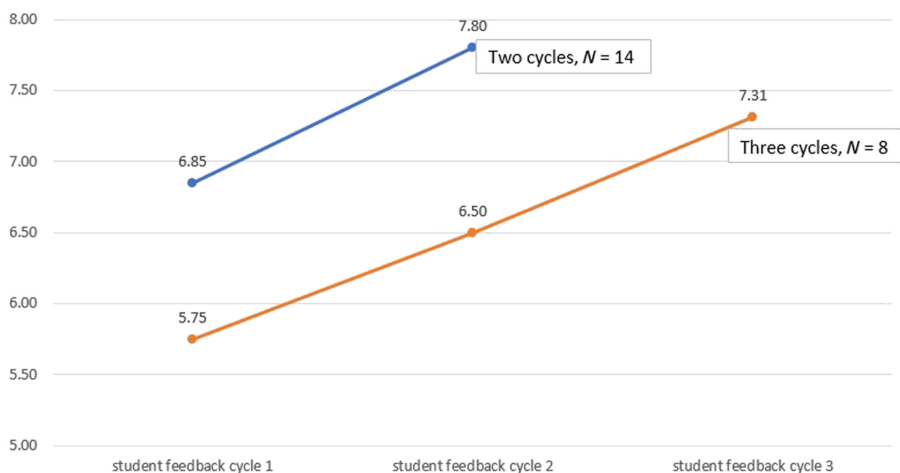
In shaping the future of first-aid courses, the study's insights advocate for a mindful reevaluation of course design and trainer development. Addressing the impact of session duration on student engagement calls for strategic considerations, encouraging organizers to optimize session lengths, incorporate breaks and enhance content delivery for a more effective learning experience. Embracing the pivotal role of lesson study cycles in trainer development suggests a shift towards systematic integration of these cycles, fostering continuous improvement for both experienced and novice trainers. The recommendation for



**Note(s):**  $N = 14$  classes conducted two cycles in eight-eight-hour format (blue),  $N = 8$  classes conducted three cycles in six-six-four-hour format (orange)

**Source(s):** Figure created by authors

**Figure 3.**  
Development of the  
teaching effectiveness  
within two,  
respectively, three  
lesson cycles



**Figure 4.**  
Development of the student feedback within, respectively, three lesson cycles

**Note(s):**  $N = 14$  classes conducted two cycles in eight-eight-hour format (blue),  $N = 8$  classes conducted three cycles in six-six-four-hour format (orange)  
**Source(s):** Figure created by authors

an additional instructional cycle in the six-six-four-hour format emerges as a pragmatic strategy, particularly beneficial for those new to the field, promising to elevate overall teaching quality. In essence, by prioritizing participant well-being, nurturing continuous professional growth and tailoring instructional approaches, future first-aid courses have the potential to not only meet but exceed the evolving needs of learners and instructors alike.

### **A new lesson-study-based first-aid coaching system for Red Cross**

The present lesson study yielded a novel first-aid coaching concept for the Youth Red Cross and the Red Cross Carinthia. To facilitate the practical application of this concept, this section summarizes the key steps a coach should follow to ensure effective first-aid coaching in a course. The coaching concept is organized into distinct chronological phases, presented in a diagram for easy understanding. The ensuing section provides a step-by-step guide for implementing the first-aid coaching concept ([Appendixes 1 to 6](#): Steps of the new first-aid coaching system based on lesson study, lesson plan, lesson plan assessment and observation descriptors, observation sheet, evaluation sheet and feedback sheet for students).

### **Conclusions**

In conclusion, this discussion focused on two research questions about the effectiveness of first-aid courses in different formats and the impact of study cycles on teaching effectiveness. The findings from the first research question revealed that tiredness significantly affected student engagement, student outcomes and teaching effectiveness in both the eight-eight-hour and the six-six-four-hour formats. Challenges with concentration, participation, listening and practice were particularly prominent after the third observation point in both formats, however, the six-six-four-hour format seems to fit well for inexperienced trainers. The second research question examined the developmental progression of study cycles on teaching effectiveness and student feedback, depending on trainers' training experience. Experienced trainers initially exhibited higher teaching

effectiveness than inexperienced trainers and experienced trainers showed continuous improvement over time. However, inexperienced trainers also demonstrated notable improvements, especially after completing a third training cycle. Implementing an additional instruction cycle in the six-six-four-hour format proved to be highly effective in enhancing teaching quality, particularly for individuals new to the field. Based on these results, a new lesson-study-based first-aid coaching system for the Red Cross was proposed, offering a step-by-step guide for implementing the coaching concept to ensure effective first-aid coaching in courses.

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Step 1	Initial contact, planning and organization The concept of lesson study is explained to the first-aid teacher, with case students being observed for their performance and the outcomes will be evaluated. With the coach’s assistance, the first-aid teacher is advised to create a lesson plan (Appendix 2). The first cycle of the study lesson in the first-aid course will proceed based on the initial communication and the lesson plan
Step 2	Observation and Documentation The coach randomly selects five case students and provides observations for these students either individually or in a team, using the observation sheet (Appendix 4). The observers document the quality of the first-aid course, considering lesson clarity and instructional variety with points (Table A3 in Appendix 3) and in writing. They assess student engagement and student outcome with points (Tables A4 and A5 in Appendix 3). Additionally, at the observational points, the first-aid teacher reflects with points and in writing on the study lesson (perceived lesson clarity and instructional variety) using the lesson plan sheet (Appendix 2)
Step 3	Coaching During the study lesson and while the first-aid teacher mainly functions as the head teacher of the study lesson, the coach actively assists the first-aid teacher. All in all, four major areas of responsibility arise for coaches <ol style="list-style-type: none"> <li>1. Reflection in-action</li> <li>2. Reflection on-action</li> <li>3. Coaching by example teaching</li> <li>4. Observation</li> </ol>
Step 4	Reflection Directly after the cycle, the coach and first-aid teacher – based on the lesson plan – instantly review and reflect on the study lesson. In a guided but natural communication, the collaborative team recapitulates both positive and negative aspects and captures first impressions on the research session
Step 5	Evaluation The coach tallies all points from the observation sheets, including the first-aid teacher’s reflection. Using this data, the coach compiles the most crucial points for improvement and prepares them for meaningful feedback
Step 6	Feedback and Debriefing As coaching regularly involves more lesson cycles, the debriefing can also serve as the preliminary discussion for the next first-aid coaching course cycle. This debriefing/preliminary discussion aims to highlight vital aspects for improvement and ensure optimum quality in the subsequent research sessions or first-aid courses conducted without a coach
Step 7	Communication Youth Red Cross/Red Cross The coach submits the documented results – observation sheets and evaluation sheets – to the Youth Red Cross or Red Cross. Consequently, the umbrella organization can substantially guarantee and improve the quality of their first-aid courses. This ensures transparent documentation of the quality of the product they offer
Step 8	Repetition of the cycle Since the goal is to establish a collaborative team for more than one cycle, steps one to seven are reiterated for each cycle

Source(s): Table created by Thomas Andreas Ogradnig

**Table A1.**  
Steps of the new first-aid coaching system based on lesson study

**Appendix 2**

**30**

Observation point	School/Class Topic	Form of teaching	Date Steps and tools	Cycle Lesson clarity and instructional variety	p	X
1					1-2 3-4 5-6 7-8 9-10	
2					1-2 3-4 5-6 7-8 9-10	
3					1-2 3-4 5-6 7-8 9-10	
4					1-2 3-4 5-6 7-8 9-10	
Overall						

**Table A2.**  
Lesson plan

**Source(s):** Table created by Thomas Andreas Ogradnig

**Appendix 3**

Lesson plan assessment and observation descriptors

Lesson clarity and instructional variety		
Term	Points	Descriptor
No success	1-2	no realization of the lesson plan; unclear lesson instructions and no instructional variety regarding teaching method
Low success	3-4	incomprehensible changes to the lesson plan; instructional misunderstandings; little variation in terms of teaching methods
Moderate success	5-6	partially implemented the lesson plan; some unnecessary changes; average lesson clarity; some instructional variations
High success	7-8	adequate implementation of the lesson plan; good implementation of necessary changes; clear instructions and methodological variations
Very high success	9-10	excellent realization of the lesson plan; brilliant incorporation of necessary changes, strong lesson clarity and eloquent instructional variety

**Table A3.**  
Lesson plan assessment

**Source(s):** Table created by Thomas Andreas Ogradnig



**Appendix 4**

Student engagement Term	Points	Descriptor
No student engagement	1–2	no commitment to the teaching content, no motivation, no attentiveness or interest
Low student engagement	3–4	partly attentive, clearly distracted, no motivation and not eager to learn
Moderate student engagement	5–6	shows interest, easily distracted, partly eager to learn but not active participation
High student engagement	7–8	committed to teaching content, motivated, eager to learn, partly distracted, participates
Very high student engagement	9–10	Active commitment, motivated, eager to learn, never distracted and interested in teaching content

**Source(s):** Table created by Thomas Andreas Ogradnig

**31**

**Table A4.**  
Student engagement descriptors

**Appendix 5**

Student outcome Term	Points	Descriptor
No success	1–2	no understanding of the subject matter, cannot answer any question and no practical know-how
Low success	3–4	little understanding of subject matter, can only answer simple questions and needs help with practical exercises
Moderate success	5–6	partial understanding but makes substantive errors, can frequently answer questions and has practical know-how but needs help
High success	7–8	adequate understanding of the subject matter, only makes occasional careless errors, can answer almost all questions and good practical know-how
Very high success	9–10	fundamental understanding of the subject matter, makes no errors, can answer all questions and has exceptional practical know-how

**Source(s):** Table created by Thomas Andreas Ogradnig

**Table A5.**  
Student outcome descriptors

Student Observation point	Student engagement		Student outcome		Lesson clarity and instructional variety		
	X	p	X	p	X	p	
1		1-2	No student engagement	1-2	No success	1-2	No success
		3-4	Low student engagement	3-4	Low success	3-4	Low success
		5-6	Moderate student engagement	5-6	Moderate success	5-6	Moderate success
		7-8	High student engagement	7-8	High success	7-8	High success
		9-10	Very high student engagement	9-10	Very high success	9-10	Very high success
2		1-2	No student engagement	1-2	No success	1-2	No success
		3-4	Low student engagement	3-4	Low success	3-4	Low success
		5-6	Moderate student engagement	5-6	Moderate success	5-6	Moderate success
		7-8	High student engagement	7-8	High success	7-8	High success
		9-10	Very high student engagement	9-10	Very high success	9-10	Very high success
3		1-2	No student engagement	1-2	No success	1-2	No success
		3-4	Low student engagement	3-4	Low success	3-4	Low success
		5-6	Moderate student engagement	5-6	Moderate success	5-6	Moderate success
		7-8	High student engagement	7-8	High success	7-8	High success
		9-10	Very high student engagement	9-10	Very high success	9-10	Very high success
4		1-2	No student engagement	1-2	No success	1-2	No success
		3-4	Low student engagement	3-4	Low success	3-4	Low success
		5-6	Moderate student engagement	5-6	Moderate success	5-6	Moderate success
		7-8	High student engagement	7-8	High success	7-8	High success
		9-10	Very high student engagement	9-10	Very high success	9-10	Very high success

**Table A6.**  
Observation sheet

Overall  
**Source(s):** Table created by Thomas Andreas Ogradnig

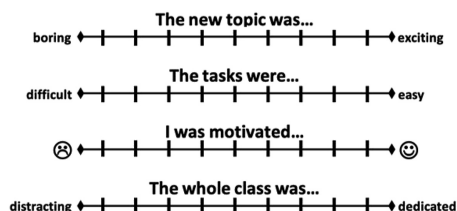
Scale	Description	o X
10-9 Excellent	Above average student learning and teaching effectiveness; all stages of the research session followed a clear structure; reasonable variation in terms of instructional variety; increased motivation of students; resulted in an above average student outcome; excellent and efficient first-aid course; some minor suggestions	
8-7 Good	Good student learning and teaching effectiveness; most stages of the research session followed a clear structure; variation in terms of instructional variety; regularly engaged and motivated students; good first-aid course; several minor suggestions	
6-5 Satisfactory	Sufficient student learning and teaching effectiveness; some stages of the research session followed a clear structure; hardly varied in terms of instructional variety; frequently engaged students; motivated students during fun stages/activities; satisfactory first-aid course; some considerable suggestions	
4-0 Not Satisfactory	Below-average student learning and teaching effectiveness; predominantly the research session followed no clear structure; no comprehensible variety in terms of instructions; students bored, subchallenged or overchallenged; not satisfactory first-aid course; vast number of suggestions; another coaching course is recommended	

Source(s): Table created by Thomas Andreas Ogradnig

Table A7.  
Evaluation sheet

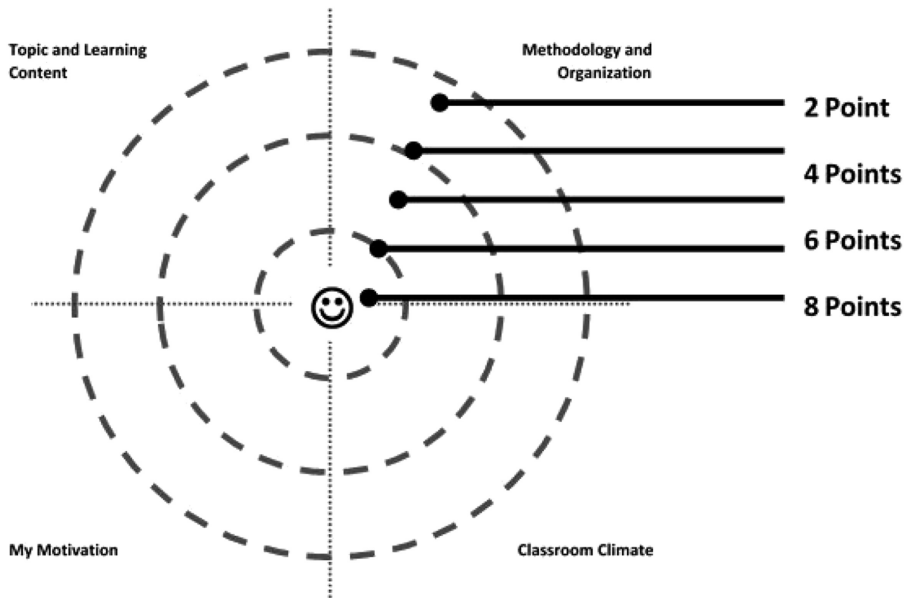
## Appendix 6

Feedback sheet for students



Source(s): Figure created by Thomas  
Andreas Ogradnig

Figure A1.  
Feedback form for 12-  
to 14-aged students



**Figure A2.**  
Feedback form for 14-  
to 18-aged students

**Source(s):** Figure created by Thomas Andreas Ogradnig

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