Training communication competence online – perceptions of dental students participating in a leadership course

Marja-Leena Hyvärinen & Tiina Tuononen

Viittausohje:

Hyvärinen, M-L., & Tuononen, T. (2026). Training communication competence online – perceptions of dental students participating in a leadership course [Vuorovaikutusosaamisen harjoittelua etäopetuksessa - hammaslääketieteen opiskelijoiden kokemuksia johtamiskurssilta]. *Prologi – Viestinnän ja vuorovaikutuksen tieteellinen aikakauslehti*, *22*(1), 92–113. https://doi.org/10.33352/prlg.148197

To cite this article:

Hyvärinen, M-L., & Tuononen, T. (2026). Training communication competence online – perceptions of dental students participating in a leadership course. *Prologi – Journal of Communication and Social Interaction*, *22*(1), 92–113. https://doi.org/10.33352/prlg.148197

Prologi
– Viestinnän ja vuorovaikutuksen tieteellinen aikakauslehti
journal.fi/prologi/

ruotsiksi: Prologi – Tidskrift för Kommunikation och Social Interaktion
englanniksi: Prologi – Journal of Communication and Social Interaction

Julkaisija: Prologos ry.

Prologos

Avoin julkaisu / Open Access
ISSN 2342-3684 / verkko

Article

Prologi, 22(1)
92–113
https://doi.org/10.33352/prlg.148197

CC BY-NC-SA 4.0

Training communication competence online – perceptions of dental students participating in a leadership course

Marja-Leena Hyvärinen
PhD, Senior University Lecturer
Language Centre, University of Eastern Finland
marja-leena.hyvarinen@uef.fi

Tiina Tuononen
PhD, Clinical Lecturer
Institute of Dentistry,
University of Eastern Finland
tiina.tuononen@uef.fi

received 27.9.2024 / accepted 15.12.2025 / published 16.1.2026

Abstract

The importance of online teaching development as part of broader preparedness for uncertain and changing conditions has been acknowledged. Designing practical, collaborative, and safe learning environments is essential for achieving the desired educational outcomes of online communication competence training. This study examines students' perceptions and assessments regarding the implementation of online small-group practical exercises aimed at developing their communication competence. The study group comprised graduating dental students participating in the compulsory course titled Dentist as a Leader in 2021 and 2022. Data were collected with an online questionnaire containing background questions, statements about exercises and open-ended questions. The data were analysed using descriptive methods and content analysis. The students' assessments of their learning, mutual collaboration, and exercise arrangements were positive. Online practical exercises were perceived to be a functional way to organise communication competence training. The students suggested that the exercises could be carried out online also in the future. A close connection was found between perceptions of a constructive and encouraging learning atmosphere, safe and confidential collaboration during the exercises, and the students' willingness to fully engage in them. Based on the students' assessments, the study suggests that an intensive online course, even with a limited number of practical exercises, can support graduating students in enhancing their communication competence and encourage its continued development.

KEYWORDS: assessment, communication competence, dental students, leadership, online training, practical exercises

Introduction

Leadership is a key component of a dentist's daily work as all dentists act as leaders in patient care situations (Fontana et al., 2017; Hanks et al., 2020; Koivumäki et al., 2021; Tuononen, 2018). Some may also take on higher leadership positions or administrative roles. In addition, dentists are often simultaneously members of dental teams led by their superiors (Grocock, 2020). In these positions, they engage in discussions, interviews, information sharing, negotiations, problem-solving, decision-making, and influencing others. All these activities are communicative – they are accomplished in interaction with others. Dentists interact both one-on-one, in groups of varying sizes, and with the entire work community (see Isotalus & Rajalahti, 2017). Therefore, it is essential that every dental student receives training in communication competence, as it is an integral part of a dentist's work and crucial for both personal and professional success. This is particularly important in healthcare and organisational settings, where effective and appropriate communication is vital (Koivumäki et al., 2021; Morreale et al., 2017; Tuononen et al., 2023). Hence, communication education plays a key role in preparing and supporting students for working life by encouraging awareness of and interest in leadership from a communication perspective (Field et al., 2017a; Larsson, 2017; Mikkola, 2020; Wali, 2018).

Interaction in work communities is increasingly taking place in online environments, in addition to face-to-face contact. Therefore, it is essential to be prepared to work in technologically enabled ways and develop technology-mediated communication competence as one key element of workplace competencies (Eklund & Isotalus, 2024). Higher education should provide students with opportunities to enhance that competence by improving and evaluating modern learning environments, such as training communication competence online (Hattar et al., 2020). Since online teaching has become a fundamental part of the communication education system, it requires research-based knowledge regarding the educational results and success of the used teaching methods (Eklund & Isotalus, 2024). However, the question is not just about teaching communication through technologies but also about teaching students how to utilise communication technologies as a meaningful shared space where participants are able to exchange information, express emotions, and collaborate within relational networks (Laitinen, 2020; Niinivaara & Lehtonen, 2023). Given that students in online learning environments often face challenges related to interaction and peer collaboration, it is essential to continuously develop and evaluate effective instructional methods for communication training in these settings (Hattar et al., 2020; Salarvand et al., 2023).

Moreover, recent global disruptions, such as the COVID-19 pandemic, have highlighted the importance of developing online teaching as part of broader preparedness for education in uncertain and rapidly changing conditions. Online teaching has already been widely studied, providing valuable insights into its pedagogical potential and limitations (e.g., Eklund & Isotalus, 2024; Saqr et al., 2020; Sellnow-Richmond et al., 2020). In turbulent contexts, communication competence plays a crucial role, particularly during structural and functional reforms where communication practices are being reshaped (Kreps, 2025). Although we now have practical experience with online teaching and learning, there remains a need for research-based practices that effectively foster peer interaction among students (e.g., Horila & Raappana, 2023; Salarvand et al., 2023). Es-

pecially in the development of communication competence, interaction often serves both as the object of learning and as a means through which learning occurs. This dual role is emphasised in contemporary learning theories, such as integrative pedagogy, which position interaction as a central element in the learning process (Tynjälä et al., 2016). Moreover, students as future professionals should be equipped with the skills to engage in meaningful interaction, even in times of uncertainty.

Accordingly, this study examines graduating students' perceptions and assessments of the online practical exercises which are integrated into a compulsory *Dentist as a Leader* course and carried out remotely on Zoom. The aim is to explore students' perceptions and assessments of their own development of communication competence, as well as their perceptions of the effectiveness of the peer collaboration and how the practical exercises functioned in an online learning environment.

Theoretical background

Although not all dental students apply for formal leadership positions after graduation, their professional role inherently requires leadership in patient care situations, where interaction with the patient constitutes a central aspect of managing the situation and making clinical decisions. In addition, they are expected to contribute actively to their professional communities (Grocock, 2020; Taipale et al., 2018). In these contexts, communication competence is essential, as it enables individuals to navigate complex social situations and adapt behaviour appropriately to the context, the people involved, and the goals of the interaction (Mikkola, 2020; Spitzberg 2013). Therefore, an understanding of the role and significance of competent communication provides a strong foundation for addressing the demands for effective interaction within professional tasks (Horila, 2020; Mikkola, 2020; Pihlainen et al., 2015; Raappana & Horila, 2020). An essential objective of communication education is to foster awareness of communication competence as a fundamental aspect of every dentist's professional competence. It is grounded in research, can be learned, and should be continuously developed (Hargie, 2006; Horila, 2020; Laajalahti, 2014).

To communicate competently across a variety of professional interactions, students need to have knowledge, skills, attitudes, and ethical understanding that enable them to engage appropriately and effectively in diverse and unique communication situations (Hargie, 2006; Spitzberg, 2013). In the present study, communication competence is defined as a form of expertise that encompasses both observable behaviours, such as verbal and nonverbal actions, and the underlying attitudinal dimensions shaped by individual values and motivational factors. These dimensions are interrelated and require metacognitive skills to reflect on and evaluate their effectiveness in relation to specific contexts, aims, or participants (Hargie, 2022; Laajalahti, 2014; Spitzberg & Cupach, 2002). Therefore, in dental education, it is important to actively involve students in the assessment process by encouraging them to take responsibility for, for example, processing the feedback they receive through reflection and personal assessment (Tonni et al., 2020).

Since communication competence is largely shaped and developed through social interaction, this study adopts the view that it can likewise be supported and enhanced through collaborative learning. This perspective aligns with the understanding of communicative

competence as a dynamic, evolving, and context-dependent capability. It is shaped by each unique interaction and requires continuous development, as it cannot be assumed to remain consistent across different situations. From this perspective, communication competence is not primarily understood as an individual skill, but as a collaboratively constructed and continuously evolving capacity among participants in interactional situations (Horila, 2025). The concept of shared communication competence emphasises that competent communication is co-constructed, context-dependent, and developed through ongoing interaction, reflection, and collaboration (Horila, 2020; Horila & Valo, 2016; Mikkola, 2020; Spitzberg & Cupach, 2002). Over time, participants can build a shared understanding and practice of competent communication, which involves mutual responsibility and requires metacognitive abilities to assess and improve the quality of interaction (Horila, 2025).

Previous research has shown that leadership courses integrated into undergraduate curricula can significantly enhance dental students' understanding of leadership, foster enthusiasm and curiosity, and increase their motivation to become effective leaders and competent communicators (D'Assunção et al., 2022; Kalenderian et al., 2010; Mota et al., 2018; Niemchick et al., 2017; Taichman et al., 2012; Tuononen et al., 2023; Victoroff et al., 2008; 2009). Organising a leadership course close to graduation has been found to be an ideal opportunity for dental students as they tend to be more open to learning non-clinical topics, such as communication in managerial roles (D'Assunção et al., 2021). However, there is a need for courses specifically tailored to dental students, in which theoretical knowledge is integrated with practical training in communication (Wali, 2018; Wardman et al., 2017). Since dental students are being prepared for a clearly defined profession, integrating a working life perspective into the learning process was seen both necessary and well justified in the present study (see Isotalus et al., 2013). From the perspective of dental students, communication competence stands out as the most critical resource for effective leadership, collaboration within the work community, and their own professional development (Tuononen et al., 2023). By guiding students to address competent communication specifically within these contexts, discipline focused educational programs can better prepare students for the realities of clinical practice and motivate them to continuously develop and refine their communication competence (Finnish Dental Association, 2020; Wardman et al., 2017).

In dentistry, existing research indicates that students' awareness of both the required communication competence and their own abilities can be enhanced through interactive training methods, such as practical exercises with constructive feedback and learning discussions in small groups, as well as self-reflective tasks (Ayn et al., 2020; Burkert et al., 2021; Nurash et al., 2020). Similar findings have been reported in studies concerning online education. It has been indicated, based on students' perceptions, that integrating practical simulation exercises with actors and an online theory module improved dental students' assessment of their communication skills (Grötz et al., 2023). A longitudinal study based on student surveys reported improvements in students' assessments of their communication competence after participating in trainer-based online training (Ramseier et al., 2024). That study also stated that students' assessment should play a more integral role in the learning process, and educational interventions should aim to systematically enhance students' capacity for effective self-evaluation. Moreover, a comparative study (Verma et al.,

2025) suggests that online education can yield outcomes comparable to traditional methods in developing cognitive, communicative, and professional competencies of students, supporting the argument that online small group training may be effective. However, challenges persist, particularly in designing appropriate courses and fostering meaningful, active, and reciprocal interactions among students to achieve the intended educational outcomes online (Eklund & Isotalus, 2024; Saqr et al., 2020).

In the ongoing development of online education, designing practical teaching and learning activities that foster collaboration and a sense of safety remains a critical objective. Therefore, promoting a constructive and encouraging learning atmosphere, where students feel safe to try new things and make mistakes, is crucial. In practice, it is beneficial to verbalise acceptance and encouragement, for instance by reassuring students that feeling nervous is entirely natural. At the same time, it is important to support students in recognising that everyone contributes to creating a safe learning environment through their behaviour, and to encourage them to engage in a constructive manner. Such a learning environment fosters interpersonal trust, and enables safe and confidential collaboration which supports deeper engagement in the learning process while helping to reduce communication-related anxiety (Hagenauer et al., 2023; Richards & Thompson, 2023; Sellnow-Richmond et al., 2020). Strong peer relationships, supported by interactive learning activities, can enhance learning outcomes, motivation, and supportive interaction by reducing social distance and strengthening students' sense of connection (Milheim, 2012). Facilitating student interaction, therefore, plays a key role in creating an encouraging learning atmosphere and promoting engagement in collaborative online activities (Engel et al., 2023; Ratliff, 2019).

However, challenges can arise as students may find online collaboration stressful and unmotivating, especially when working with strangers or lacking a sense of mutual benefit (Niinivaara & Lehtonen, 2023). Issues such as unfamiliar group members, fear of making mistakes, heightened emotional states, such as anxiety, and limited peer support can hinder active participation, highlighting the challenges of building trusting relationships, presence, and engagement (Horila & Raappana, 2023; Salarvand et al., 2023). A common barrier is the fear of appearing incompetent in front of peers (Nurlaela et al., 2024). Despite appreciating the peer connections offered by online courses, students face difficulties with conversational flow, interpreting nonverbal cues, and adjusting to the unique communicative demands of online interaction compared to face-to-face settings (Eklund & Isotalus, 2024; Hyvärinen et al., 2024; Sellnow-Richmond et al., 2020).

Acknowledging the emotions evoked by collaborative exercises and fostering an accepting attitude toward participation are essential for supporting student engagement. Addressing theoretical perspectives on uncertainty and anxiety, along with exploring students' experiences beforehand, can help reduce fear of failure and create a more encouraging learning environment (Hyvärinen et al., 2024). Moreover, since motivation and the intention to participate in a learning situation significantly influence student engagement in collaboration, facilitating active participation requires both strengthening students' motivation and reducing anxiety (Nurlaela et al., 2024). Research shows that a student's high motivation for learning reduces anxiety, and vice versa (Conklin et al., 2024). Further research is needed to explore how var-

ious online teaching methods, such as practical exercises, impact students' motivation, engagement, collaboration, and the development of communication competence (Conklin et al., 2024; Richards & Thompson, 2023).

The evaluation and development of communication competence, along with the training designed to support it, are central components of high-quality education. Students' perspectives have proven to be important in this process, as they provide information on how the learning environment and instructional methods are perceived (Ayn et al., 2017; Eklund & Isotalus, 2024; Salarvand et al., 2023). Although students' perspective offers educators valuable insights for designing more purposeful teaching, relying exclusively on students' perceptions may present certain limitations. There is no universal agreement, for example, on what constitutes effective communication, and assessments can vary significantly depending on the evaluator, whether it be the individual, peers, instructors, or external experts (Spitzberg, 2000; 2013). Individual perceptions of one's own competence and potential for development may also affect the reliability of the assessment (Laajalahti, 2014). For instance, it has been recognised that both healthcare students and professionals may tend to either overestimate or underestimate their communication competence, which can distort the interpretation of their assessments (e.g., Cuevas-Nunez et al., 2022; Henry et al., 2016; Tariq et al., 2014). However, research shows that communication training can enhance the accuracy of students' reflection and assessments and promote a more realistic understanding of one's own competence (Wettergreen et al., 2022), which was one of the aims in the present study. Consequently, despite their limitations, student-led assessment practices can serve as a valuable tool for investigating students' experiences and support the development of effective online education (Atif et al., 2024; Khalaf et al., 2023; Niinivaara & Lehtonen, 2023).

Accordingly, this study examines students' perceptions and assessments of the online practical exercises of the compulsory university course *Dentist as a Leader* for graduating dental students. The research question is as follows: How do students perceive and assess their communication competence learning outcomes, the effectiveness of peer collaboration in small groups, and the practical implementation of these exercises?

Materials and methods

Setting

The course *Dentist as a Leader* has been a part of the curriculum for 5th-year dental students since 2015. The course includes lectures on leadership, work community dynamics, self-management, and team leadership, as well as (interactive) interviews with leaders at different levels and career stages. It consists of 27 hours of lectures, 18 hours of independent assignments, and 9 hours of practical exercises (3 sessions of 3 hours each). The course is part of a broader work-life competence training that complements clinical education. It focuses on identifying profession-specific situations where the dentist acts as a leader, describing what leadership work entails, the challenges it presents, and the communication competence required for the role. Earlier in their studies, students complete two mandatory courses on dentist-patient communication as part of their curriculum. The course lectures are organised by the Department of Dentistry, while the practical exercises are planned and implemented

collaboratively by teachers in dentistry and communication.

In spring 2020, the previous face-to-face teaching format was replaced with online instruction due to the COVID-19 pandemic. However, this did not lead to significant changes in the course content, and the teaching arrangements of the practical exercises, such as course outline and the content of each practical section, remained largely consistent with those used in face-to-face instruction. The course has been conducted online since 2020, using Teams for lectures and Zoom for practical exercises (with cameras and microphones on). The authors of this article are the teachers responsible for the practical exercises.

The practical exercises, forming a communication competence training module examined in this study, were designed according to the principles of integrative pedagogy. This approach enables students to apply theoretical knowledge of communication in practice-oriented tasks, where cooperation, interaction, and reflection play a central role in the learning process (Tynjälä et al., 2016). Prior to each exercise, students engaged with theoretical content related to communication, which was then applied during the practical sessions. The practical exercises focused on developing communication competence, interacting with diverse target groups, and simulating challenging communication situations as both a member and a leader of a work community. The teaching was based on the ADEE competencies (Association of Dental Education in Europe; Tonni et al., 2020), specifically those outlined in Domain II: Safe and Effective Clinical Practice, which includes leadership, teamwork, and communication competence (Table 1). The teaching was partly based also in Domain IV: Dentistry in Society, which encompasses oral health as part of society and healthcare and promoting population health and preventing diseases (Field et al., 2017a; Finnish Dental Association, 2020).

Course outline and the content of each practical section

The practical exercises described in this study had similar online implementations in 2021 and 2022. Before the exercises, the students completed preliminary tasks, such as reading articles and other online materials on topics like

Table 1. Dental students' competency goals of leadership, team-working, and communication in Finland (Finnish Dental Association, 2020)

Leadership, team-working, and communication
After graduating, the dentist: • Effectively leads all members of the dental care team • Is able to communicate understandably and competently with the patient or the entities representing him/her, work communities, stakeholders and the public • Identify strengths and development areas of the own communication style • Is able to work with the care team, taking into account health, safety and hygiene • Is able to work professionally and constructively in cooperation with the care team and stakeholders as well as in the professional group

leadership and communication competence development and reflecting on the themes emerging from these materials. They were instructed to familiarise themselves with the content, take notes on key observations and reflections, and prepare to discuss the themes openly and confidentially in small groups (3-4 students, with changing participants) during Zoom breakout sessions. The exercises were led by both the dental clinical teacher and the communication teacher. Through their guidance, the teachers aimed to strengthen constructive collaboration and feedback discussions. Accordingly, each exercise began and ended with a joint opening and closing discussion for the entire group facilitated by both instructors.

The first exercise focused on self-leadership and reflecting on one's own communication competence. The preliminary reading materials addressed topics such as communication competence and its development, communication anxiety, building trust in interaction, and fostering constructive collaboration. The students were instructed to reflect on their communication competence both as leaders and as members of a work community. They assessed their strengths and areas for improvement and set goals to develop their communication skills. By sharing their previous work experiences in small groups, the students were encouraged to reflect on the kind of leaders and colleagues they aspire to become. The exercise was designed to support students in reflecting on their communication competence and to promote collaborative learning by sharing personal experiences and discussing them with others. As a result of these discussions, a joint working agreement was created collaboratively with the entire group.

In the second exercise, the focus was on the role of the dentist as an expert in various collaborative situations. Students prepared and delivered short informative expert speeches on an important dental topic (e.g., health trends and their impact on oral health) to two different target groups (e.g., parents, media). The students either chose their target group themselves or had it selected for them by their small group. During the exercise, the students worked in small groups, where they practiced giving speeches, asking questions, participating in discussions, and giving and receiving feedback. Prior to this exercise, the students had reviewed materials related to oral presentations, influencing, and argumentation. The exercise was designed to enhance students' ability to communicate their expertise clearly to diverse audiences, also outside their professional field. Through feedback discussions, they were guided to reflect on and express their own perceptions and assessments of their communication skills.

The third exercise focused on interaction in various collaboration situations in the workplace. The main topics included argumentation, constructive discussion, seeking common solutions, and shared decision-making in a group. With the help of preliminary materials, the students were guided to study group communication and negotiation skills, which they were then expected to apply in the exercises. In small groups, the students simulated challenging workplace discussions related to field specific topics, taking on predetermined roles either as dentist colleagues or dentist leaders. This exercise was included to help students understand how attitudes toward the topic, oneself, the situation, and others influence collaboration and its outcomes, as well as how cooperation can be jointly assessed and developed.

Data collection

The target group of this study were 5th-year dental students (n=79) participating in the compulsory *Dentist as a Leader* course in 2021 (n=44) and 2022 (n=35). The study group comprised 63 participants (2021 n=37, 2022 n=26) who completed the questionnaire and gave their written consent to participate (response rate 80 %). The mean age of the participants was 27 years (SD 1.7), with 68 % (n=43) identifying as female and 32 % (n=20) identifying as male.

The materials were collected in 2021 and 2022 after the course using a similar Webropol questionnaire, which included multiple-choice questions about the lectures and practical exercises. This study focused on the practical exercises, which participants assessed using 20 statements on a five-point Likert scale (1=totally disagree, 5=totally agree) (Table 2). Three open-ended questions invited participants to share their thoughts on what worked (1) well (32 comments) or (2) poorly (12 comments) in the online course implementation and (3) how the course could be further developed (6 comments). The questionnaire was created for this study, since no corresponding surveys were directly aligned with its topic.

This study followed the Finnish national guidelines (Finnish Advisory Board on Research Integrity, 2023) and the university's internal instructions for the data processing agreement. In Finland, the support of the Ethics Committee is not usually required for research like the present study in which data are collected using a voluntary questionnaire without personal data related to health or other sensitive topics. In the questionnaire, the students were informed that participation in the study was entirely voluntary, and their responses would not be used unless they provided explicit consent. The data processing agreement included pre-information about the study, the data collection process, analysis, and potential disclosure of the data. The students were also given the opportunity to ask questions regarding the research. They were assured that their responses would be treated confidentially and would not be disclosed to third parties.

Data analysis

The responses to the statements about practical exercises were initially evaluated by examining the frequencies and percentages of the Likert-scale responses (1=fully disagree, 5=fully agree), and then further analysed using means and standard deviations (SD). The main section, consisting of 17 statements, was grouped into three sum variables: (1) *Learning*, (2) *Collaboration*, and (3) *Exercises* (Table 2). The sum variables were created by summing the values of variables that measure the same phenomenon. This provided more detailed insights into how the students assessed their learning and collaboration, as well as the exercises in the course. In the results section, we report evaluations based on both the sum variables and the individual Likert-scale statements. The remaining statements addressed the participants' anxiety before the exercises and their suggestions for future exercise arrangements (see Table 3). These were similarly analysed using frequencies and percentages for individual responses, as well as means and standard deviations. The courses held in different years were not compared with each other. However, we aimed to examine the results both annually and as a combined dataset to identify any potential yearly differences and their associated reasons.

Qualitative data were used in this study to provide additional insight and to complement the

quantitative findings. The open-ended questions asked for evaluations of the course's overall effectiveness and ineffectiveness, along with suggestions for further developing its online implementation. For this study, responses concerning the practical exercises were analysed applying inductive qualitative content analysis approach (Schreier, 2012; Tuomi & Sarajärvi, 2018). The responses were analysed to identify insights that would enrich the quantitative results related to learning, collaboration, and the implementation of the exercises. In the first phase of the analysis, each response to the open-ended questions was treated as a separate unit. Expressions with similar meanings, including words, sentence fragments, and full sentences, were grouped (e.g., well-functioning online implementation, wish for face-to-face exercises). These expressions were then used to complement the quantitative findings in the results section, where selected excerpts from the open-ended responses are also presented. Each data excerpt is accompanied by the researcher-assigned student ID and the year the course was completed (e.g., 57/2021). The researchers responsible for analysing the material held multiple discussions to critically assess how subjectivity and the study's context could influence the qualitative data analysis (Olmos-Vega et al., 2022).

Results

The students' assessments of their *Learning* in communication competence, the mutual *Collaboration* during the online exercises, and the overall arrangements of the *Exercises* were positive. The participants found that the online version of the exercises in small groups functioned well, and most suggested that the exercises could also be implemented online in the future. The overall mean level of anxiety reported by the students prior to the exercises was relatively low, although there was substantial individual variation.

The students' assessments of *Learning* were rated high (mean 4.1; SD 0.6). The assessments of the *Collaboration* during the exercises received even higher ratings (4.6; 0.5). The arrangements of the *Exercises* were also rated positively (4.3; 0.4). These sum variables are shown in Table 2, showing positive results in all measured areas.

While rating individual Likert-scale statements the students perceived the learning atmosphere in the exercises as constructive and encouraging (4.7; 0.5), which was rated highest among the individual statements related to sum variables of *Learning* and *Collaboration*. In contrast, the lowest individual statement score was for the students' assessments of how the themes covered and communication skills practiced aligned with the needs of the working life (3.9; 0.9). Similarly, slightly lower scores were found for the students' assessments of the development of their communication skills (4.0; 0.8) and their ability to further develop their communication competence in the future (4.0; 0.7). However, these results were still generally very positive.

The students gave high ratings to the statement regarding the success of the online implementation during the 2021 and 2022 courses (4.8; 0.5) (see Table 2). On the other hand, the score for the future online arrangement ("The exercises could also be implemented online in the future") was moderate (4.1; 1.0), but it was clearly higher than the score of the alternative face-to-face arrangement mode ("The exercises would work better in face-to-face teaching") (3.0; 1.0). However, the variation was high for both statements. Reported anxiety levels related to the exercises were low (2.4; 1.4), but there was significant variation among the respondents (Table 3).

Table 2. Participants´ responses on five-point Likert scale (1=fully disagree, 5=fully agree) and means and standard deviations (SD) on the individual statements, and three sum variables: 1. Learning, 2. Collaboration, and 3. Exercises; p-values were calculated by Mann-Whitney U-Test (*statistically significant p-value ≤ 0.05).

Results	All Participants					All	2021	2022	
(1=fully disagree, 5=fully agree)	1	2	3	4	5				
	n (%)					mean (SD)			p
Learning SUM	1 (0.2)	13 (2.9)	74 (16.5)	225 (50.2)	135 (30.1)	4.1 (0.6)	4.0 (0.6)	4.1 (0.5)	
My understanding of interpersonal communication competence and its significance in leadership improved	0	1 (1.6)	9 (14.1)	36 (56.3)	18 (28.1)	4.1 (0.7)	4.1 (0.7)	4.2 (0.6)	0.51
My understanding of interpersonal communication competence and its significance in the work community improved	0	1 (1.6)	8 (12.5)	34 (53.1)	21 (32.8)	4.2 (0.7)	4.2 (0.7)	4.2 (0.6)	0.98
The exercises strengthened my understanding of myself as a communicator	0	3 (4.7)	9 (14.1)	25 (39.1)	27 (42.2)	4.2 (0.9)	4.2 (1.0)	4.2 (0.6)	0.82
The exercises strengthened my view of my interpersonal communication competence	0	1 (1.6)	11 (17.2)	30 (46.9)	22 (34.4)	4.1 (0.8)	4.1 (0.8)	4.2 (0.7)	0.50
The exercises developed my communication skills	0	3 (4.7)	15 (23.4)	28 (43.8)	18 (28.1)	4.0 (0.8)	3.8 (0.9)	4.1 (0.7)	0.27
My capabilities for developing my interpersonal communication competence in the future improved	0	1 (1.6)	11 (17.2)	37 (57.8)	15 (23.4)	4.0 (0.7)	4.0 (0.8)	4.0 (0.5)	0.91
The processed themes and practised communication skills corresponded with working life needs	1 (1.6)	3 (4.7)	11 (17.2)	35 (54.7)	14 (21.9)	3.9 (0.9)	3.8 (1.1)	4.0 (0.7)	0.98
Collaboration SUM	0	0	8 (3.2)	76 (30.0)	169 (66.8)	4.6 (0.5)	4.6 (0.4)	4.5 (0.6)	
The learning atmosphere in the exercises was constructive and encouraging	0	0	1 (1.6)	16 (25.0)	47 (73.4)	4.7 (0.5)	4.7 (0.5)	4.7 (0.5)	0.63
I experienced the collaboration as safe and confidential	0	0	2 (3.1)	19 (29.7)	43 (67.2)	4.6 (0.5)	4.7 (0.5)	4.6 (0.6)	0.70
Collaboration between the students was successful	0	0	2 (3.1)	19 (29.7)	43 (67.2)	4.6 (0.5)	4.7 (0.5)	4.5 (0.6)	0.37
Collaboration between the students supported and strengthened my learning (missing n=3 2022)	0	0	3 (4.7)	22 (34.4)	36 (56.3)	4.5 (0.6)	4.6 (0.5)	4.4 (0.7)	0.16
Exercises SUM	1 (0.3)	4 (1.0)	39 (10.2)	176 (45.8)	164 (42.7)	4.3 (0.4)	4.2 (0.4)	4.4 (0.4)	
The teaching arrangements for the exercises worked well (group size, scheduling, time use, instructions...)	0	1 (1.6)	6 (9.4)	28 (43.8)	29 (45.3)	4.3 (0.7)	4.2 (0.8)	4.5 (0.6)	0.17
The used learning methods were appropriate and suitable	1 (1.6)	0	6 (9.4)	39 (60.9)	18 (28.1)	4.1 (0.8)	4.1 (0.9)	4.2 (0.6)	0.81
The exercises were useful	0	2 (3.1)	7 (10.9)	33(51.6)	22 (34.4)	4.2 (0.7)	4.1 (0.8)	4.3 (0.7)	0.51
The exercises were interesting	0	1 (1.6)	7 (10.9)	33 (51.6)	23 (35.9)	4.2 (0.7)	4.2 (0.7)	4.3 (0.7)	0.34
I worked actively to reach the goals set for the exercises	0	0	11 (17.2)	31 (48.4)	22 (34.4)	4.2 (0.7)	4.1 (0.7)	4.2 (0.7)	0.76
The exercises succeeded online.	0	0	2 (3.1)	12 (18.8)	50 (78.1)	4.8 (0.5)	4.7 (0.6)	4.9 (0.3)	0.08

Almost all the students' assessment scores in 2022 were equal to or higher than those in 2021, except for the statements regarding the safe and confidential collaboration, the success of collaboration among the students, and how the collaboration between the students supported and strengthened learning (Table 2). The largest difference was seen in the statement about online implementation of the exercises in the future: in 2022 students gave higher scores (4.5; 0.7) compared to 2021 (3.8; 1.1) (see Table 3).

The themes identified in the supplementary open-ended responses regarding the well-functioning aspects of the online implementation included the smooth operation of the online arrangements and the effectiveness of small group work in breakout rooms. These findings were consistent with the quantitative results. As the following data excerpts show, the students reported that they had a good opportunity to practice confidentially in a peaceful learning environment. They also noted that the online format allowed them to practice interacting via technology, a skill they believed would be valuable in their future careers:

> Breakout rooms were very good for this, because there you could talk in peace and confidentially in a small group. (57/2021)

> The online exercises gave everyone their own peace for discussions and exercises, this would not necessarily have been the case in the classroom. (2/2022)

> …small group sizes and working without an "audience" removed the pressure and made the communication feel authentic. (4/2022)

> I think the exercises worked really well online and taught me how to have a conversation via video, which will definitely be needed in the future as well. (43/2021)

Although the students stated that the online *Exercises* functioned well overall (Table 2), they also identified, in open-ended responses, certain aspects they perceived as ineffective and proposed changes for future implementations. These included a desire for shorter preparation times before the start of small group exercises, requests for smaller group sizes, increased teacher presence during group work situations, and exercises focused on problem-solving scenarios:

> It may have taken a little time to chat at the beginning of the sessions, but it is certainly important to create a confidential and comfortable atmosphere. (31/2021)

> Maybe smaller groups or more teachers so that the teacher can focus better on individuals. (40/2021)

> For example, giving a speech is not in itself the most essential core competence. You could think about developing more communication competence in problem situations. (36/2021)

The students indicated that the online version of the exercises was successful (Table 2), but some preferences for the face-to-face exercises were expressed in open ended responses, as follows. These individual responses included the needs of those experiencing anxiety, as well as issues related to internet connection:

> For those suffering from performance anxiety, perhaps a face-to-face situation would better simulate the real situation. (62/2021)

> Some of the exercises could perhaps work better as classroom teaching. (41/2021)

> Connections broke down, and I was kicked out several times. My internet was simply not always enough, which was miserable. (49/2022)

Table 3. Participants´ responses about the anxiety and opinions about future exercise arrangements on five-point Likert scale (1=fully disagree, 5=fully agree) and means and standard deviations (SD); p-values were calculated by Mann-Whitney U-Test (*statistically significant p-value ≤ 0.05).

Results		All Participants					All Participants	2021	2022	
	1=fully disagree, 5=fully agree	1	2	3	4	5	Mean (SD)			p
Anxiety: I was very nervous about the exercises		24 (37.5)	15 (23.4)	11 (17.2)	6 (12.5)	8 (12.5)	2.4 (1.4)	2.7 (1.5)	2.0 (1.1)	0.071
Future arrangement	The exercises would work better in face-to-face teaching	3 (4.7)	20 (31.3)	25 (39.1)	9 (14.1)	7 (10.9)	3.0 (1.0)	3.2 (1.0)	2.7 (1.0)	0.057
	The exercises could be implemented online also in the future	0	6 (9.4)	11 (17.2)	19 (29.7)	28 (43.8)	4.1 (1.0)	3.8 (1.1)	4.5 (0.8)	0.008*

Discussion

The overall evaluation of the practical exercises was high across all studied aspects. As our findings indicate, the students perceived and evaluated the exercises as helpful in improving their understanding and perspectives on communication competence in leadership and work community contexts. This suggests that an intensive course, even with a limited number of exercises, can positively impact students by helping them assess their own communication behaviour and supporting the development of communication competence.

Based on the quantitative results, *Collaboration* among students received the highest scores of the three main aspects assessed in the exercises. According to the students' assessments, the overall learning atmosphere was perceived as constructive and encouraging, with successful collaboration seen as supporting and strengthening their learning. This outcome is positive, as fostering collaboration that students perceive as safe and confidence-building has been recognised as a key factor in developing communication competence in online learning environments (Eklund & Isotalus, 2024). The exercises in this study provided students with the opportunity to face new situations, engage in joint training, reflect, and participate in feedback discussions. The findings suggest that learning was enhanced by the students' willingness to immerse themselves in the exercises, fostered by an encouraging and constructive atmosphere. This supports earlier findings that a sense of safety, acceptance, tolerance for mistakes, and the courage to participate are essential for effective collaborative learning in online communication exercises (Hyvärinen et al., 2024). Furthermore, the students' assessments related to *Learning* support the interpretation that students were engaged in the exercises, as evidenced by their positive evaluations across all areas measuring learning in this study.

Previous research has shown that familiarity with fellow students impacts on learning activities, such as online group discussions (Eklund & Isotalus, 2024). For example, familiarity with group members can reduce negative emotions and increase willingness to participate in online learning situations (Horila & Raappana, 2023). Therefore, the positive results of this study may be attributed to the students' motivation and their constructive attitudes toward peer interaction, where fellow students were respected and valued. This is a noteworthy finding, as practicing communication with close peers and engaging in mutual feedback can be both challenging and emotionally demanding (Koponen et al., 2011; Magill et al., 2023), yet it appears that the students were willing and committed to the process. Since some students had worked as dentists the previous summer (Act on Health Care Professionals 559/1994), this work experience may also have increased their motivation to practice and their need for feedback on communication skills. In addition, all these students had experience in mutual collaboration as well as cooperation with clinical teachers and other healthcare staff during clinical training at the university.

In this study, a strong connection was found between the students' ratings of learning atmosphere, collaboration during the exercises, and students' courage to fully engage in the activities. The mean level of anxiety reported by students before the exercises was relatively low across the entire group. However, there was considerable variation in the students' assessments. It is well established that emotions significantly impact students' learning outcomes (Pekrun & Linnenbrink-Garcia, 2012; Tynjälä et al., 2016). In distance learning, anxiety is a

common phenomenon, and avoidance of interaction, especially when students are unfamiliar with one another (Horila & Raappana, 2023). It is possible that the mutual familiarity among the graduating students in this study influenced their assessments, as well as the low levels of anxiety. The results could have been different if they had been strangers or less familiar with one another. It is also possible that some participants chose not to disclose their anxiety in the questionnaire.

One interesting finding is that some of the students perceived that practicing in an online learning environment provided a stronger sense of safety compared to traditional face-to-face teaching, as highlighted in their open-ended responses. The students worked in small groups during the exercises, which may have reduced the potential stress and anxiety associated with practising (Niinivaara & Lehtonen, 2023). It is also possible that the students' motivation explains the results; research shows that a student's high motivation for learning reduces anxiety, and vice versa (Conklin et al., 2024). An interactive and constructive learning environment was intentionally fostered, which likely supported perceived successful collaboration. At the course outset, the students were introduced to relevant material on the topic, which was then addressed collectively, and established shared practices to promote safe and confidential interaction (Nurlaela et al., 2024). Reflective rounds at the beginning and end of each session provided teachers with a structured opportunity to support the reaching of these aims.

Students' emotional and cognitive interest and engagement in learning can be strengthened through encouragement, acceptance, and emotional support, particularly when learning occurs in student-student interactions (Bolkan & Griffin, 2018; Mazer, 2017). Therefore, it is important to emphasise that various emotions, such as anxiety, are an essential part of the learning process (Pekrun & Linnenbrink-Garcia, 2012). Ensuring safe and confidential collaboration through an encouraging and constructive learning atmosphere is essential, and addressing these themes in teaching is not only necessary but has also shown to be effective (Hyvärinen et al., 2024). In this study, anxiety was addressed in the preliminary assignments and in the first exercise, which may explain the formation of the results. In addition, student guidance provided at the beginning of each exercise emphasised the importance of safe and confidential collaboration. The cameras were on throughout all stages of the exercises, which may also have positively affected the students' engagement and their interaction with each other (Minosky et al., 2024).

On the other hand, some students participating in this study expressed a desire for more teacher participation in exercises, although the reasons behind this need were not clearly expressed. Previous research has shown that students' preferences for teacher involvement and peer interaction can vary widely (Hagenauer et al., 2023). Students may seek teacher support for various reasons, such as challenges in collaborating with peers, lack of motivation, or differing learning goals (Niinivaara & Lehtonen, 2023). Future studies could explore these factors in more detail to better understand when and why students require teacher guidance while working with their peers.

The students reported that the teaching arrangements for the exercises worked well, and the used learning methods were appropriate and suitable for them. The open-ended responses confirmed these results. For example, the students had noted that working in small

groups in breakout rooms in Zoom provided a good opportunity to practice in a confidential and peaceful learning environment, which may not be as easily achieved in traditional classroom settings. In the final stage of their studies, the students had less face-to-face teaching, which allowed them to work from home in a quiet setting. This was perceived as one of the positive aspects of building communication competence in small groups.

Most students reported that the exercises succeeded online, and several students believed that the exercises could be organised remotely also in the future. However, the standard deviations in both statements were quite wide. A few students noted in the open-ended responses that, particularly for those experiencing anxiety related to the exercises, face-to-face teaching might be a more suitable option. Although the results do not explicitly reveal the reasons behind these responses, one plausible explanation could be the need for richer interaction. Face-to-face teaching allows for rich nonverbal communication, such as facial expressions and gestures. Since these elements are less prominent in online teaching environments, the development of a shared sense of presence and mutual engagement among participants may be weakened (Eklund & Isotalus, 2024; Hyvärinen et al., 2024; Sellnow-Richmond et al., 2020). On the other hand, the students' assessments in 2022 were significantly more positive than in 2021, showing a positive trend concerning the online implementation of the exercises in this study.

This study confirmed that even a limited amount of time and practice can lead to meaningful improvements in perceived communication competence, provided that the learning environment supports peer interaction and is experienced by students as safe (Grötz et al., 2023; Richards & Thompson, 2023). The students reported enhanced communication skills and increased self-awareness through the exercises. They also assessed that the course helped them to practice key communication skills that corresponded with working life needs (Field et al., 2017b; Grötz et al., 2023). For example, awareness of one's own communication behaviour and its impact on others can be considered a key element in strengthening shared communication competence (Horila & Valo, 2016; Rouhiainen-Neunhäuserer, 2009; Spitzberg, 2013). The students' assessments of mutual collaboration, sense of safety, and the perceived success of exercises are closely linked to the concept of shared communication competence, which emphasises collective responsibility and the ability to evaluate and improve the quality of interaction (Horila, 2025). This concept thus provides a valuable framework for understanding how communication skills practiced and reflected upon during the course can be co-constructed, shared, and developed collaboratively throughout the learning process in online environments.

The students were informed that participation in the study was completely voluntary, and the data were processed anonymously throughout all phases of the study. They were also informed that the data would be collected for the purpose of course development and research. At that stage, it was not yet known who would analyse the data. Course assessment was based on participation in lessons and practical exercises, and was either accepted or rejected without numerical grades. The response rates were high in both years. However, it must be acknowledged that although participation was voluntary, the study design may have influenced students' evaluations. It is possible that the course would have been assessed differently if someone other than their own teachers had conducted the data collection. Furthermore, this study did not gather

data on students' actual behaviour, which would have strengthened the reliability of the findings.

Although student evaluations in the present study were positive in all measured areas (*Learning, Collaboration, Exercises*), these assessments should be interpreted with caution. For example, the students' assessments of the development of their communication competence may be more positive than those of the teachers (Hyvärinen et al., 2011). Similar findings have been reported in studies with newly graduated dentists, who assessed their general leadership skills more positively than experienced dentists who had supervised the students (Koivumäki et al., 2021). At the same time, it is commonly observed that dentists working in clinical practice face challenges in objectively evaluating their own communication competence (Kruse et al., 2020). The reliability of such evaluations depends significantly on who conducts the assessment: whether it is a student, a peer, a professional in the field, or a teacher – with each bringing their own perspective, level of experience, and subjective factors into the evaluation process (Laajalahti, 2014; Spitzberg, 2000).

While the findings are valuable for understanding what students felt they had learned and how they perceived the exercises, they do not offer insight into how the training influences actual behaviour (Kumar et al., 2020). On the other hand, studies suggest that communication training helps individuals develop more realistic and accurate assessments and a clearer understanding of their own competence (Wettergreen et al., 2022). Therefore, it can be assumed that the preliminary materials together with instructional methods supported students' assessments, which aligns with previous findings on the benefits of flipped learning fostering reflection on communication competence (Koponen, 2019). The students' earlier communication training in patient-dentist interaction exercises may also have supported their assessments. This is in line with broader understanding that embedding communication training throughout the curriculum fosters a deeper understanding of competent communication (Burkert et al., 2021).

The consistent results of the two consecutive courses strengthen the reliability of this study findings. Additionally, the quantitative findings have been corroborated by qualitative data. However, the scope of the data was limited, as the exercises were evaluated as part of a broader survey. Therefore, their success was evaluated holistically rather than in detail, and in retrospect, we recognise that more targeted questions might have provided deeper insight into what students found most helpful for their learning. Although the study was conducted in Finnish context, we believe that the course design is applicable to educational systems in other countries and disciplines as well. Despite focusing on profession-specific communication competence training, the content of the exercises and the skills practiced also represent general (i.e., generic) competencies that are independent of context and field.

The results reflected the students' subjective evaluations and satisfaction with the success in online format. To increase the reliability of assessment, additional research is needed that incorporates, for example, teachers' perspectives. This study was unable to do so due to limited resources. The topic could also be explored using various methods, such as reflective writings, thematic interviews or analysis of authentic student interactions, to gain deeper insight into students' learning experiences, perceptions, and communication competence as enacted. Future studies could examine how students conceptu-

alise communication competence, how practical exercises support them for their future profession, and the specific situations for which they are prepared. A follow-up study could also explore how newly graduated dentists perceive the alignment between their academic training and the demands of professional practice.

In summary, based on the students' assessments, this study demonstrated that an intensive online course, even with a limited number of practical exercises, could support graduating students in enhancing their communication competence and fostering its continued development. The students' assessments regarding their communication competence and the quality of peer collaboration, as well as their perceptions of the practical exercises provided valuable insights into the overall effectiveness of the training programme. The most important outcome of the course was the students' perception of a constructive and encouraging learning atmosphere and safe and confidential collaboration. To get more detailed results concerning students' training communication competence via online practical exercises, a multi-perspective evaluation could enable a more objective understanding of the training's impact. Since there was variation related to the students' experiences of anxiety, it would also be an appropriate subject for future study. Although this study focused on a leadership course for dental students, its results can also be applied to teaching communication in other fields and contexts. The development of technology-based interaction and learning is becoming increasingly necessary as workforce demands evolve. At the same time, it serves as preparation for training communication in times of uncertainty.

References

Act on Health Care Professionals 559/1994. (1994). Finlex. Retrieved June 10, 2025, from https://www.finlex.fi/api/media/statute-foreign-language-translation/290986/mainPdf/main.pdf?timestamp=1994-06-28T00%3A00%3A00.000Z

Atif, S., Fahim, A., Chaudhry, A. R, Dar, D. N., Syed, S. A., & Rana, S. (2024) Leadership competencies for dentists: What do undergraduate students think? *PLoS ONE, 19*(9), e0310459. https://doi.org/10.1371/journal.pone.0310459

Ayn, C., Robinson, L., Matthews, D., & Andrews, C. (2020). Attitudes of dental students in a Canadian university towards communication skills learning. *European Journal of Dental Education, 24*(1), 126–133. https://doi.org/10.1111/eje.12476

Ayn, C., Robinson, L., Nason, A., & Lovas, J. (2017). Determining recommendations for improvement of communication skills training in dental education: A scoping review. *Journal of Dental Education*, *81*(4), 479–488. https://doi.org/10.21815/JDE.016.003

Bolkan, S., & Griffin, D. (2018). Catch and hold: Instructional interventions and their differential impact on student interest, attention, and autonomous motivation. *Communication Education, 67*(3), 269–289. https://doi.org/10.1080/03634523.2018.1465193

Burkert, V., Stoykova, M., & Semerdjieva. M. (2021). Communication skills teaching methods in dental education: A review. *Folia Medica*, *63*(1), 30–34. https://doi.org/10.3897/folmed.63.e52343

Conklin, S., Ovarzun, B., Kim, S., & Dikkers, A. G. (2024). Exploring the relationships of learners and instructors in online courses. *Online Learning, 28*(4), 257–281. https://doi.10.24059/olj.v28i4.3934

Cuevas-Nunez, M. C., Pulido, M. T., Harpe, S., Stein, A. B., & Lempicki, K. (2022). Assessment of communication and physical exam skills: A comparison of students, faculty and standardized patients. *Journal of Dental Education*, *86*(7), 853–862. https://doi.org/10.1002/jdd.12892

D'Assunção, F., Kalenderian, E., Carneiro, D., Verçosa, M., dos Santos, J., Yansane, A., D'Assunção, V., & Felinto, A. (2021). Presence of management, entrepreneurship, leadership and marketing topics in the dental school curriculum in Brazil. *European Journal of Dental Education, 26*(2), 384–392. https://doi.org/10.1111/eje.12714

D'Assunção, F., Carneiro, D., Verçosa, M., Kalenderian, E., D'Assunção, V., Felinto, A., & Santiago, B. (2022). Impact of the curricular component management and professional guidance on the level of knowledge about administration of dentistry students at UFPB. *Revista da ABENO, 22*(2), 1629. https://doi.org/10.30979/revabeno.v22i2.1629

Eklund, M., & Isotalus, P. (2024). Having it both ways: Learning communication skills in face-to-face and online environments. *Frontiers in Education, 9,1270164*. https://doi.org/10.3389/feduc.2024.1270164

Engel, O., Zimmer, L. M., Lörz, M., & Mayweg-Paus, E. (2023). Digital studying in times of COVID-19: Teacher- and student-related aspects of learning success in German higher education. *International Journal of Educational Technology in Higher Education, 20*(12). https://doi:10.1186/s41239-023-00382-w

Field, J. C., Cowpe, J. G., & Walmsley, A. D. (2017a). The graduating European dentist: A new undergraduate curriculum framework. *European Journal of Dental Education, 21*(S1), 2–10. https://doi.org/10.1111/eje.12307

Field, J. C., Walmsley, A. D., Paganelli, C., McLoughlin, J., Szep, S., Kavadella, A., Manzanares Cespedes, M. C., Davies, J. R., DeLap, E., Levy, G., Gallagher, J., Roger-Leroi, V., & Cowpe, J. G. (2017b). The graduating European dentist: Contemporaneous methods of teaching, learning and assessment in dental undergraduate education. *European Journal of Dental Education, 21*(S1), 28–35. https://doi.org/10.1111/eje.12312

Finnish Dental Association (Suomen Hammaslääkäriliitto). (2020). *Kliinisen arvioinnin kriteerit ja matriisi 2020* [In Finnish]. https://tkharjoittelu.hammaslaakariliitto.fi/sites/skh/files/kliinisen_arvioinnin_kriteerit_ja_matriisi_20201.pdf

Finnish National Board on Research Integrity [TENK]. (2023). *Guidelines for ethical review in human sciences*. Retrieved August 6, 2024, from https://tenk.fi/sites/default/files/2023-06/RI_Guidelines_2023.pdf

Fontana, M., González-Cabezas, C., Peralta, T., & Johnsen D. (2017). Dental education required for the changing health care environment. *Journal of Dental Education, 81*(8), eS153–eS161. https://doi.org/10.21815/JDE.017.022

Grocock, R. (2020). Leadership in dentistry. *British Dental Journal, 228*(11), 882–885. https://doi.org/10.1038/s41415-020-1633-4

Grötz, T. J., Zöll, L., Hollinderbäumer, A., Nowak, T., Zajontz, T., Behling, L., Fischbeck, S., Schmidt, U., & Deschner, J. (2023). Effect of a one-time communication training session on dental students' self-efficacy expectancy. *International Journal of Environmental Research and Public Health*, *20*(4), 3323. https://doi:10.3390/ijerph20043323

Hagenauer, G., Muehlbacher, F., & Ivanova, M. (2023). "It's where learning and teaching begins - is this relationship" — Insights on the teacher-student relationship at university from the teachers' perspective. *Higher Education, 85*(4), 819–835. https://doi:10.1007/s10734-022-00867-z

Hanks, S., Gotton, D., & Spoward, L. (2020). Leadership in dental practice: A three stage systematic review and narrative synthesis. *Journal of Dentistry, 102*, 103480. https://doi.org/10.1016/j.jdent.2020.103480

Hargie, O. (2022). A conceptual model of skilled interpersonal communication. In O. Hargie (Ed.), *Skilled interpersonal communication: Research, theory and practice* (7th ed., pp. 17–42). Routledge.

Hargie, O. (2006). Skill in theory: Communication as skilled performance. In O. Hargie (Ed.), *The handbook of communication skills* (3rd ed., pp 7-36). Routledge.

Hattar, S., AlHadidi, A., Sawair, F., Alraheam, I., El-Ma'aita, A., & Wahab F. (2020). Impact of COVID-19 pandemic on dental education: Online experience and practice expectations among dental students at the University of Jordan. *BMC Medical Education, 21*(151). https://doi.org/10.1186/s12909-021-02584-0

Henry, B. W., McCarthy, D. M., Nannicelli, A. P., Seivert, N. P., & Vozenilek, J. A. (2016). Patients' views of teamwork in the emergency department offer insights about team performance. *Health Expectations: An International Journal of Public Participation in Health Care and Health Policy*, *19*(3), 702–715. https://doi.org/10.1111/hex.12148

Horila, T. (2025). Shared communication competence: Moving beyond the individual in interprofessional communication. In S. Fox, K. McAllum, & L. Mikkola (Eds.), *Interprofessional communication in health and social care: Theoretical perspectives on practical realities* (pp. 165–182). Palgrave Macmillan. https://doi.org/10.1007/978-3-031-70106-1_10

Horila, T. (2020). Communication competence in the workplace. In L. Mikkola & M. Valo (Eds.), *Workplace communication* (pp. 165–178). Routledge.

Horila, T., & Raappana, M. (2023). Yliopisto-opiskelijoiden näkemyksiä etäopiskelun ryhmätilanteista. [University students' perceptions on group discussions in online learning]. *Prologi: Journal of Communication and Social Interaction, 19*(1), 25–42. https://doi.org/10.33352/prlg.119943

Horila, T., & Valo, M. (2016). Yhteinen vuorovaikutusosaaminen tiimissä. [Shared communication competence in teams] *Prologi: puheviestinnän vuosikirja, 12*(1), 46–58. https://doi.org/10.33352/prlg.95912

Hyvärinen, M-L., Tanskanen, P., Katajavuori, N., & Isotalus, P. (2011). Evaluating the use of criteria assessing profession-specific communication skills in pharmacy. *Studies in Higher Education, 37*(3), 291–308. https://doi.org/10.1080/03075079.2010.510183

Hyvärinen, M-L., Pakarinen, E., & Kekoni, T. (2024). Online simulations as a tool of integrative pedagogy in learning social work practice skills. *Social Work Education, 43*(9), 2914–2932. https://doi.org/10.1080/02615479.2023.2299264

Isotalus, P., Ala-Kortesmaa, S., Gerlander, M., Hyvärinen, M-L., Koponen, J., & Välikoski, R. (2013). Alakohtainen vuorovaikutuskoulutus lääkärin, farmaseutin ja juristin professioissa. *Prologi: puheviestinnän vuosikirja, 9*(1), 7–28. https://doi.org/10.33352/prlg.95885

Isotalus, P., & Rajalahti, H. (2017). *Vuorovaikutus johtajan työssä*. [Interaction in the work of a leader]. Alma Talent.

Khalaf, M. E., Ziada, H., & Abubakr, N. H. (2023). The dental educational environment of online and blended learning during COVID-19, and the impact on the future of dental education. *Dentistry Journal*, *11*(2), 41. https://doi.org/10.3390/dj11020041

Koivumäki, J., Chainier, A., Gürsoy, M., Kangasmaa, H., Karaharju-Suvanto, T., Meriläinen, S., Näpänkangas, R., Savanheimo, N., & Suominen, L. (2021). *Nuori hammaslääkäri 2021*. [The Young Dentist -study 2021]. Suomen Hammaslääkäriliitto: Tutkimusraportti. Available from: https://www.hammaslaakariliitto.fi/sites/default/files/2022-06/Nuori%20hammasl%C3%A4%C3%A4k%C3%A4ri%202021.pdf Accessed August 6, 2024

Koponen, J. (2019). The flipped classroom approach for teaching cross-cultural communication to millennials. *Journal of Teaching in International Business*, *30*(2), 102–124. https://doi.org/10.1080/08975930.2019.1663776

Koponen, J., Pyörälä, E., & Isotalus, P. (2011). A comparison of medical students' perceptions of three experiential methods. *Health Education*, *111*(4), 296–318. https://doi.org/10.1108/09654281111144265

Kreps, G. L. (2016). Communication and effective interprofessional health care teams. *International Archives of Nursing and Health Care*, *2*(3), 51. https://doi.org/10.23937/2469-5823/1510051

Kruse, A. B., Heil, H. K., Struss, N., Fabry, G., Silbernagel, W., Vach, K., Ratka-Krüger, P., & Woelber, J. P. (2020). Working experience is not a predictor of good communication: Results from a controlled trial with simulated patients. *European Journal of Dental Education, 24*(2), 177–185. https://doi.org/10.1111/eje.12482

Kumar, B., Swee, M., & Suneja, M. (2020). Leadership training programs in graduate medical education: A systematic review. *BMC Medical Education, 20*(1), Article 175. https://doi.org/10.1186/s12909-020-02089-2

Laajalahti, A. (2014). *Vuorovaikutusosaaminen ja sen kehittyminen tutkijoiden työssä*. [Interpersonal communication competence and its development in the work of researchers] (Doctoral dissertation, University of Jyväskylä, *Jyväskylä Studies in Humanities*, 225). http://urn.fi/URN:ISBN:978-951-39-5618-9

Laitinen, K. (2020). Vuorovaikutusteknologia työyhteisössä: Teknologiavälitteinen vuorovaikutus virtuaalitiimeissä ja työyhteisön sosiaalisessa mediassa. [Communication technology in the workplace: Technology-mediated communication in virtual teams and on enterprise social media] (Doctoral dissertation, University of Jyväskylä, *JYU Dissertations*, 287). https://jyx.jyu.fi/handle/123456789/71789

Larsson, M. (2017). Leadership in interaction. In J. Storey, J. Hartley, J.-L. Denis, P. Hart & D. Ulrich (Eds.), *The Routledge companion to leadership* (pp. 173–193). Routledge.

Magill, M., Mastroleo, N. R., Kuerbis, A., Sacco, P., Thombs-Cain, G. E., Wagner, E. F., & Velasquez, M. M. (2022). Practice makes perfect: MSW students reflect on skill-based teaching methods in clinical social work education. *Journal of Social Work Education, 59*(4), 991–1005. https://doi:10.1080/10437797.2022.2103605

Mazer, J. P. (2017). Associations among classroom emotional processes, student interest, and engagement: A convergent validity test. *Communication Education, 66*(3), 350–360. https://doi.org/10.1080/03634523.2016.1265134

Milheim, K. L. (2012). Towards a better experience: Examining student needs in the online classroom through Maslow's hierarchy of needs model. *Journal of Online Learning and Teaching*, *8*(2), 159–171.

Mikkola, L. (2020). Leadership in the workplace. In L. Mikkola, & M. Valo (Eds.), *Workplace communication* (pp. 123-135). Routledge.

Minosky, S., El Aini, N., Justus, B. J., & Bali, T. (2024). The effect of video camera, microphone and chat box use on social presence and engagement in an online group activity. *Online Learning, 28*(4), 334–354. https://doi.10.24059/olj.v28i4.4133

Morreale, S. P., Valenzano, J. M., & Bauer, J. A. (2017). Why communication education is important: a third study on the centrality of the discipline's content and pedagogy. *Communication Education*, *66*(4), 402–422. https://doi.org/10.1080/03634523.2016.1265136

Mota, J. M. S., Araujo, M. E. de, Biazevic, M. G. H., Carrer, F. C. de A., Lopez-Capp, T. T., & Michel-Crosato, E. (2018). Personal and professional profile, education, and perception of management and entrepreneurship of dentistry students. *Revista Da ABENO, 18*(4), 85–94. https://doi.org/10.30979/rev.abeno.v18i4.785

Niemchick, A. L., Delgado, J., Taichman, R. S., & Inglehart, M. R. (2017). Dental students', alumni, and dentists' perspectives on leadership: Impact of the scholars program in dental leadership. *Journal of Dental Education*, *81*(1), 44–53. https://doi.org/10.1002/j.0022-0337.2017.81.1.tb06246.x

Niinivaara, J., & Lehtonen, H. (2023). Verkko-opetuksen kehittäminen viestintä- ja kieliopinnoissa – yliopisto-opiskelijoiden kokemukset ja käsitykset vuorovaikutuksesta. [Development of online teaching in communication and language studies - University students' experiences and perceptions of communication]. *Prologi: Journal of Communication and Social Interaction, 19(*1), 5–24. https://doi.org/10.33352/prlg.119994

Nurash, P., Kasevayuth, K., & Intarakamhang, U. (2020). Learning programmes and teaching techniques to enhance oral health literacy or patient-centred communication for healthcare providers: A systematic review. *European Journal of Dental Education, 24*(1), 134–144. https://doi.org/10.1111/eje.12477

Nurlaela, N., Amiruddin, A., Irfan, A. M., & Setialaksana, W. (2024). Communication anxiety as barrier: Extending theory of planned behavior on student intention to participate in synchronous online learning. *Information and Learning Sciences, 125*(11/12), 966–985. https://doi.org/10.1108/ILS-10-2023-0136

Olmos-Vega, F., Stalmeijer, R., Varpio, L., & Kahlke, R. (2022). A practical guide to reflexivity in qualitative research: AMEE Guide No. 149. *Medical Teacher, 45*(3), 241–251. https://doi.org/10.1080/0142159X.2022.2057287

Pekrun, R., & Linnenbrink-Garcia, L. (2012) Academic emotions and student engagement. In S. Christenson, A. L Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 259–282). Springer Science + Business Media. https://doi.org/10.1007/978-1-4614-2018-7_12

Pihlainen, V., Kivinen, T., & Lammintakanen, J. (2015). Management and leadership competence in hospitals: A systematic literature review. *Leadership in Health Services, 29*(1), 95–110. https://doi.org/10.1108/LHS-11-2014-0072

Raappana, M., & Horila, T. (2020). Team communication in the workplace. In L. Mikkola & M. Valo (Eds.), *Workplace communication* (pp. 28–40). Routledge.

Ramseier, C. A., Hübschi, C., Crnić, T., & Woelber, J. P. (2024). Implementation of a communication curriculum in undergraduate dental education: Students' opinions during a 5-year development phase. *European Journal of Dental Education*, *28*(1), 227–235. https://doi.org/10.1111/eje.12940

Ratliff, K. (2019). Building rapport and creating a sense of community: Are relationships important in the online classroom? *Internet Learning Journal, 7*(1), 31–48. https://doi:10.18278/il.7.1.4

Richards, K., & Thompson, B. (2023). Challenges and instructor strategies for transitioning to online learning during and after the COVID-19 pandemic: A review of literature. *Frontiers in Communication, 8,* 1260421. https://doi.org/10.3389/fcomm.2023.1260421

Rouhiainen-Neunhäuserer, M. (2009). Johtamisen viestintähaasteet tietoperustaisessa työssä. [Leadership communication challenges in a knowledge-based organization]. *Prologi: puheviestinnän vuosikirja, 5*(1), 90–95. https://doi.org/10.33352/prlg.95809

Salarvand, S., Mousavi, M-S., & Rahimi, M. (2023). Communication and cooperation challenges in the online classroom in the COVID-19 era: A qualitative study. *BMC Medical Education, 23*(201). https://doi.org/10.1186/s12909-023-04189-1

Saqr, M., Nouri, J., Vartiainen, H., & Malmberg, J. (2020). What makes an online problem-based group successful? A learning analytics study using social network analysis. *BMC Medical Education*, *20*(1), Article 80. https://doi.org/10.1186/s12909-020-01997-7

Schreier, M. (2012). *Qualitative content analysis in practice.* Sage.

Sellnow-Richmond, D., Strawser, M., & Sellnow, D. (2020). Student perceptions of teaching effectiveness and learning achievement: A comparative examination of online and hybrid course delivery format. *Communication Teacher, 34*(3), 248–263. https://doi:10.1080/17404622.2019.1673456

Skoulas, A., & Kalenderian, E. (2012). Leadership training for postdoctoral dental students. *Journal of Dental Education, 76*(9), 1156–1166. https://doi.org/10.1002/j.0022-0337.2012.76.9.tb05370.x

Spitzberg, B. H. (2000). What is good communication? *Journal of Association for Communication Administration, 29*(1), 103–119.

Spitzberg, B. H. (2013). (Re)Introducing communication competence to the health professions. *Journal of Public Health Research*, *2*(3), e23–e23. https://doi.org/10.4081/jphr.2013.e23

Spitzberg, B., & Cupach, W. (2002). Interpersonal skills. In M. L. Knapp & J. A. Daly (Eds.), *Handbook of interpersonal communication* (3rd ed., pp. 564–611). Sage.

Taichman, R., Parkinson, J., Nelson, B., Nordquist, B., Ferguson-Young, D., & Thompson, J. (2012). Leadership training for oral health professionals: A call to action. *Journal of Dental Education, 76*(2), 185–191. https://doi.org/10.1002/j.0022-0337.2012.76.2.tb05245.x

Taipale, H., Tuononen, T., & Suominen, A. L. (2018). Fifth-year dental students' visions of leadership – A qualitative study. *European Journal of Dental Education, 22*(4), 272–280. https://doi.org/10.1111/eje.12359

Tariq, M., Boulet, J., Motiwala, A., Sajjad, N., & Ali, S. (2014). A 360-degree evaluation of the communication and interpersonal skills of medicine resident physicians in Pakistan. *Education for Health (Abingdon, England)*, *27*(3), 269–276. https://doi.org/10.4103/1357-6283.152188

Tonni, I., Gadbury-Amyot, C., Govaerts, M., ten Cate, O., Davis, J., Garcia, L., & Valachovic, R. (2020). ADEA-ADEE Shaping the future of dental education III: Assessment in competency-based dental education: Ways forward. *Journal of Dental Education, 84*(1), 97–104. https://doi.org/10.1002/jdd.12024

Tuomi, J., & Sarajärvi, A. (2018). Laadullinen tutkimus ja sisällönanalyysi [Qualitative research and content analysis] (Revised edition). Tammi.

Tuononen, T. A., Kauhanen, M., Suominen, A. L., & Hyvärinen, M.-L. (2023). Leadership and work community – Views of graduating dental students. *Leadership in Health Services, 36*(4), 511–523. https://doi.org/10.1108/LHS-10-2022-0102

Tuononen, T. (2018). *Leadership careers of Finnish dentists* (Doctoral dissertation, University of Eastern Finland, Publications of the University of Eastern Finland: *Dissertations in Health Sciences, 467*). https://erepo.uef.fi/server/api/core/bitstreams/62417289-3f1a-4270-9667-5bb539d99745/content

Tynjälä, P., Virtanen, A., Klemola, U., Kostiainen, E., & Rasku-Puttonen, H. (2016). Developing social competence and other generic skills in teacher education: Applying the model of integrative pedagogy. *European Journal of Teacher Education, 39*(3), 368–387. https://doi.org/10.1080/02619768.2016.1171314

Verma, A., Pramila, M., & Sandur, G. (2025). Comparative analysis of the overall level of preparedness of dental graduates for their cognitive, communication, and professional skills in terms of offline and online education: A non-randomized controlled trial. *Revista Sul-Brasileira de Odontologia*, *22*(1), 19–27. https://doi.org/10.21726/rsbo.v22i1.2657

Victoroff, K. Z., Schneider, K., & Perry, C. (2008). Leadership development for dental students: What do students think? *Journal of Dental Education*, *72*(9), 982–988. https://doi.org/10.1002/j.0022-0337.2008.72.9.tb04572.x

Victoroff, K. Z., Schneider, K., & Perry, C. (2009). Tomorrow's leaders, starting today: A pilot leadership development program for dental students. *Journal of Dental Education*, *73*(3), 311–318. https://doi.org/10.1002/j.0022-0337.2009.73.3.tb04703.x

Wali, O. (2018). Leadership skills in dental curriculum – A review. *Journal of Evolution of Medical and Dental Sciences, 7*(42), 4584–4588. https://doi.org/10.14260/jemds/2018/1022

Wardman, M. J., Ford, J., & Manogue, M. (2017). Undergraduate leadership education for dentistry: Preparing for practice. *European Journal of Dental Education*, *21*(4), e109–e113. https://doi.org/10.1111/eje.12228

Wettergreen, S. A., Pearson, M. J., & Scoular, S. K. (2022). Comparison of students' self-assessment and simulated patient assessment in a patient counselling evaluation and perceived importance of communication skills. *Pharmacy*, *10*(6), 177. https://doi.org/10.3390/pharmacy10060177

OTSIKKO JA ASIASANAT SUOMEKSI:

Vuorovaikutusosaamisen harjoittelua etäopetuksessa – hammaslääketieteen opiskelijoiden kokemuksia johtamiskurssilta

ASIASANAT: arviointi, etäopetus, hammaslääketieteen opiskelijat, johtaminen, käytännön harjoitukset, vuorovaikutusosaaminen