

REVIEW

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Twelve tips for teaching medical communication skills in a second language

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Abstract

Introduction As healthcare becomes increasingly globalized, language barriers between international medical professionals and local patients pose significant threats to patient safety and care quality. Most medical curricula lack structured approaches to developing second language (L2) communication competencies.

Purpose & relevance This article provides 12 practical tips for integrating medical L2 communication teaching in health professions education. Combining experiential learning theory with research informed strategies, these tips address a critical gap and are essential for educators teaching international medical students or healthcare workforce.

Key tips The tips are organized into three key phases: Course Design (Tips 1–3) focuses on incorporating whole-task learning to replicate real-world medical interactions, establishing patient-centered intended learning outcomes (ILOs), and designing performance assessments that include self-assessment tools. Course Delivery (Tips 4–8) emphasizes interactive teaching strategies such as simulation-based learning, role-playing exercises, collaborative learning, and integrating multiple feedback sources including peer, instructor, and simulated patient feedback. Steering Learning and Continuous Improvement (Tips 9–12) targets fostering a positive learning environment through reflection and feedback, balancing student confidence with stress management, and facilitating the transfer of learning from simulated tasks to real-world practice.

Impact Implementing these 12 practical tips can help educators take steps toward addressing the needs in second language (L2) medical communication training. By integrating experiential learning and research informed strategies into health professions education, these tips provide a structured approach to developing the communication skills of international medical students. This can lead to more effective patient-doctor interactions in multilingual medical settings, contributing to improved patient safety and care quality.

Keywords Medical communication, Second language learning, Experiential learning theory, Simulation-based learning, Health professions education

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Introduction

As the medical profession becomes increasingly interconnected internationally, language and communication emerge as critical challenges for international medical professionals working in regions where a different language is spoken. Language barriers between healthcare professionals and local patients have long been recognized as significant impediments to improving patient care quality [1, 10, 51, 56]. These barriers not only affect the quality of care but also pose risks to patient safety, making it essential to address them within medical education. The integration of second language (L2) communication skills into medical education is particularly crucial, as it involves not only the acquisition of medical terminology but also the development of grammatical accuracy, fluency, and appropriate use of language in clinical contexts. Effective communication is essential, especially when delivering sensitive information or empathizing with patients during difficult times.

A growing body of international scholarship has emphasized the importance of structured communication training for multilingual and internationally mobile medical students. Research across diverse healthcare systems has demonstrated that language discordance affects patient safety, clinical reasoning, and relational trust [14, 23]. Educational responses have therefore increasingly incorporated structured L2 communication training, simulation-based methods, and peer-assisted learning models [5, 44]. The present framework builds upon these international developments while offering a structured experiential model tailored to medical second-language communication.

Kolb's experiential learning cycle—with its four stages of Concrete Experience (CE), Reflective Observation (RO), Abstract Conceptualization (AC), and Active Experimentation (AE), offers a valuable framework for developing medical communication skills in second-language learners. Despite the growing recognition of the need for effective second-language (L2) communication skills in medical education, there remains a significant gap in structured approaches to integrating these skills into the curriculum. Our research empirically builds upon Kolb's model in medical L2 education, showcasing its practical implications. This paper demonstrates how various components of the model are applied in medical communication learning settings (Fig. 1): CE is primarily exemplified through simulated patient consultations (SPC), which replicate authentic medical consultations and function as the core experiential anchor of the cycle [56], RO is strengthened by feedback from multiple sources (peers, group, simulated patients, or self-reflection) and oral or written format at different learning stages [55], AC emerges as learners analyze feedback to derive general communication principles

[55], and AE refers to learners' deliberate ing of refined communication strategies derived from prior reflection and conceptualization, following structured debriefing and principle abstraction that scaffold subsequent performance. Accordingly, AE is implemented through role-playing scenarios, open or closed learning tasks, and native or nonnative learning partnerships when these activities are used to intentionally re-apply revised communicative approaches rather than as initial exposure experiences [53, 56]. By delineating these implementations, the paper underscores how Kolb's cycle can be systematically operationalized in medical L2 pedagogy—emphasizing the crucial roles of feedback, instructional design, and simulation-based learning environments. These findings offer researchers and educators concrete strategies for applying experiential learning theory in specialized communication contexts.

To better prepare international medical students for real-world practice, universities face the challenge of integrating local language learning into their curricula, which is essential for students to connect and care for patients in the region [53]. Moreover, hospitals emphasize the need for international medical professionals to communicate seamlessly with local patients, highlighting the challenge of ensuring effective second-language communication in clinical settings. In this context, robust second-language communication skills become essential for fostering smooth healthcare interactions between second language speaking professionals and local patients. This is especially critical in patient-centered care, where accurate understanding and effective interaction are key to delivering high-quality care [1, 11]. These skills include not only speaking but also listening, reading, and writing in the target language, as well as the ability to use appropriate language registers and cultural references. In our context, the international medical program is delivered in English while clinical training occurs in the local language. Students enrolled in this program are therefore required to acquire discipline-specific medical communication competencies in a second language within the timeframe of their medical training. Given these challenges, researchers have investigated the key elements that contribute to students' success in learning medical communication and the local language in international medical programs [3, 11, 32, 52]. Research has addressed the needs of improving international medical students' second language medical communication and has shared research results on the effectiveness of designing a medical context-focused second language learning approach [54], the impact of feedback on students' learning [12, 55], the influence of simulation-based whole-task learning courses on international learners' medical communication [16, 47, 56], and the benefits of second language Medical Dutch learning. Additionally, research

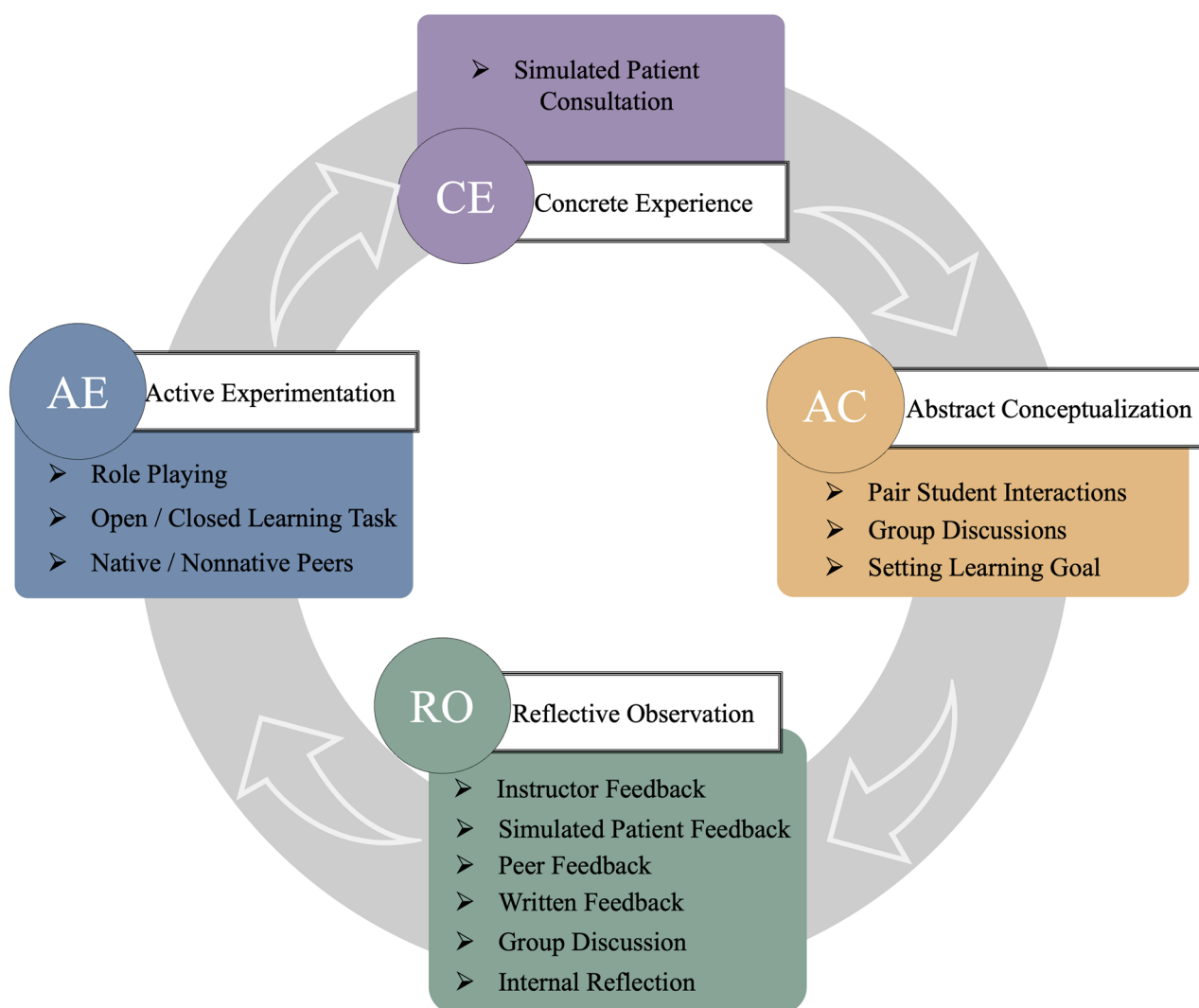


Fig. 1 A structured experiential learning model tailored to training medical second-language communication

has explored how learning strategies, such as role-playing and native and nonnative peers, contributed to the development of skills in second language medical communication [18, 53].

This paper presents twelve research-informed strategies for improving second-language medical communication instruction to address these challenges. These strategies synthesize empirical findings from second language acquisition and medical education research, incorporate insights from our prior implementation studies, and include theoretically informed pedagogical recommendations. These tips are guided by a central research question: *How can second language medical communication skills be integrated into an international medical curriculum?* These tips are structured into three key phases that could be applied at different stages of the course: course design phase, course delivery phase, and steering learning and continuous improvement phase (Fig. 2).

Within this framework, whole-task learning design constitutes a foundational instructional principle. Whole-task learning refers to an approach in which learners engage in authentic, complex tasks that integrate knowledge, skills, and professional attitudes as they occur in real-world practice, rather than practicing isolated subskills [47]. In medical L2 communication education, this involves structured exposure to simulated clinical consultations that combine linguistic, communicative, and professional competencies within coherent clinical tasks.

A. Course design phase

The course design phase emphasizes effective strategies for teaching second language medical communication, focusing on three key elements: whole-task learning design, aligned intended learning outcomes (ILOs) with learning goals, and performance assessment [20, 46]. This phase operationalizes whole-task principles through

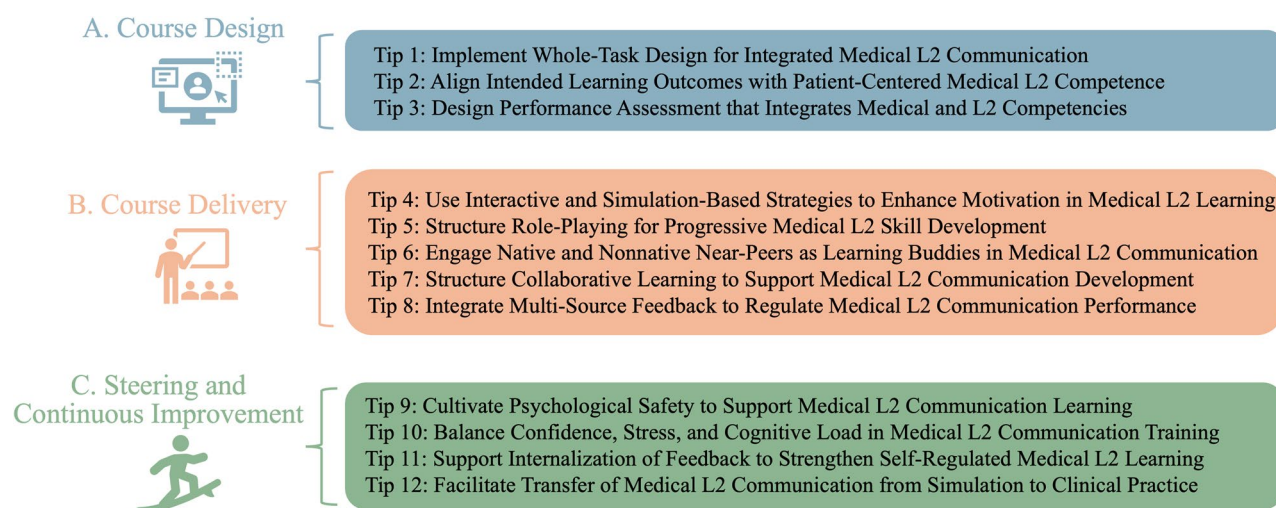


Fig. 2 Twelve tips for teaching medical communication in a second language

structured clinical communication tasks, such as simulated consultations, diagnostic interviews, and team-based case discussions (Tip 1). Furthermore, it stresses the importance of clearly defined ILOs that emphasize patient-centered communication, empathy, and rapport-building, while also focusing on grammatical accuracy, fluency, and appropriate language use in clinical contexts (Tip 2). Finally, it advocates for performance assessments that extend beyond traditional testing methods, incorporating self-assessment tools to foster students' self-awareness and active participation in their learning progress. These assessments should evaluate both medical communication and second language proficiency, including speaking, listening, reading, and writing skills (Tip 3).

Tip 1: Implement whole-task design for integrated medical L2 communication

Adopting a whole-task design approach in medical communication courses that are taught in a second language strategically equips students with the competencies needed for a smooth transition from learners to practitioners. High scaffolding and heavy teaching in language learning can lead to low motivation and engagement. In this context, high scaffolding refers to extensive instructor-led structuring of tasks, including scripted dialogues, predefined linguistic formulations, and step-by-step guidance that limit learner autonomy and reduce exposure to authentic communicative complexity. In contrast, the whole-task approach enhances medical communication skills by providing practice in using the target language in realistic scenarios. This method supports second language acquisition by promoting student engagement and encouraging them to use their new language skills in simulated scenarios

[47]. Within this framework, whole-task design enables learners to practice integrated communication competencies in simulated clinical contexts that mirror professional demands. [16].

Whole-task learning emphasizes the importance of engaging students in complex, authentic tasks that mirror real-life scenarios. This approach aligns with the principles of Cognitive Load Theory, which suggests that learning is most effective when cognitive load is managed appropriately. For second language learners, this means balancing task complexity with scaffolding techniques to support language development [42]. By intentionally presenting a higher level of difficulty than traditional didactic learning tasks, whole-task learning stimulates student engagement and promotes deeper learning processes. However, it is crucial to carefully calibrate the level of difficulty to avoid causing excessive cognitive overload [53].

Action points

Implement Authentic Tasks: Design and apply tasks that replicate real-world medical interactions, such as simulated patient consultations and diagnostic interviews. These tasks provide essential practice in using the target language, supporting second language acquisition [15].

Balance Learning Load: Ensure that the complexity of tasks is appropriately calibrated to challenge students without overwhelming them. Therefore, scaffolding should be adaptive and gradually withdrawn as learners gain competence, ensuring that task complexity remains manageable without oversimplifying authentic communication demands. [42].

Tip 2: Align intended learning outcomes with patient-centered medical L2 competence

When designing a medical second language communication course, it is crucial to establish the correct intended learning outcomes (ILOs) that prioritize patient-centered medical communication. These ILOs should focus on developing students' skills in empathetic communication, active listening, and building rapport with patients from diverse backgrounds, while also emphasizing grammatical accuracy, fluency, and appropriate language use in clinical contexts [25, 29]. Moreover, the ILOs should be personalized based on the iteration of real-time interaction in simulated environments and should provide opportunities for students to engage in introspection and briefing of learning goals at different stages of the course.

To achieve these ILOs, course designers should incorporate case-based learning and patient experience into the curriculum. This integration provides students with a profound understanding of the patient experience, supporting the development of empathetic and effective communication skills, as well as enhancing second language proficiency [50]. Active listening and empathy-building exercises are integral components of this approach, as they are vital for establishing rapport and trust with patients, which are foundational aspects of patient care [7].

The inclusion of role-playing exercises and simulated patient consultations in the curriculum allows students to apply their second language skills in a practical context. These activities enable students to observe and assess the impact of their language and behavior on patient care outcomes, reinforcing the importance of effective communication in medical practice [56].

Action points

Develop Patient-Centered ILOs: Create ILOs that emphasize empathetic communication, active listening, and rapport-building with diverse patients, while also focusing on grammatical accuracy, fluency, and appropriate language use. Ensure these outcomes are measurable and aligned with the course objectives [25, 29].

Enhance Active Listening and Empathy Skills: Learning medical communication in the classroom is never the same as learning in a simulated consultation room. Include course activities aimed at developing active listening and empathy, which are critical for building trust and rapport with patients [7].

Tip 3: Design performance assessment that integrates medical and L2 competencies

Performance assessment in medical communication should not be limited to conventional writing and

speaking tests. While these tests can provide a basic understanding of overall second language proficiency, they fail to adequately reflect the advanced skills crucial for real-life medical communication. Performance assessments should evaluate both medical knowledge and second language proficiency, including speaking, listening, reading, and writing skills [15]. Performance assessment needs to encompass comprehensive task design and utilize open tasks to accurately evaluate students' abilities in this context. Key medical communication skills, such as those used in medical consultations employing a second language, including attitudes and self-expression, listening skills, the use of open and closed questions, and consultation structure, should be integrated into and expanded upon conventional language tests. This approach allows students to gain a true understanding of their progress toward effective real-world medical communication.

Building on this foundation, the capacity for students to self-evaluate their learning progress is a critical component of academic development. Self-assessment tools enable students to continuously monitor their progress and achievements, supporting both medical communication and second language proficiency. Traditional course evaluations, including feedback from instructors and periodic assessments, may offer limited insight into the ongoing learning process [33]. To address this limitation, performance assessment should incorporate self-assessment tools that enable students to evaluate progress against defined criteria.

In this context, the creation of personalized learning goal briefings allows students to document their growth, engage in reflection on their learning, and pinpoint areas for improvement [40]. This practice not only prevents complacency or excessive stress but also fosters a proactive approach to education. Effective self-monitoring and self-assessment methods, such as rubrics or checklists, enhance reflective learning and empower students to take an active role in their language learning [53]. By combining comprehensive task design with self-assessment tools, performance assessment in medical communication can provide a holistic view of students' progress and better prepare them for real-world challenges.

Action points

Expand Assessment Methods: Incorporate open ended evaluation methods, such as rubrics and simulation tasks, to evaluate advanced medical communication skills, including attitudes and self-expression, listening skills, and consultation structure. These methods support second language

acquisition by providing comprehensive feedback on language use [15, 46].

Self-Assess Personalized Learning Goals: Students need to develop personalized learning goal briefings to help students document their growth, engage in reflection, and identify areas for improvement. These briefings support second language acquisition by helping students track their progress in language proficiency [25, 40]. Applying examples of learning goals within rubrics can help students personalize and track their own development in course performance [33].

B. Course delivery phase

During the course delivery phase, designed strategies are enacted through practical application, prioritizing dynamic and engaging methods to enhance second language communication skills in medical education. Recognizing the crucial role of motivation (Tip 4), the curriculum incorporates interactive methods such as simulation-based teaching and role-playing to create authentic, career-relevant experiences [53]. Role-playing is emphasized as a key technique for simulating real-world medical interactions, requiring careful planning and clear objectives to maximize its effectiveness. This technique allows students to practice and refine their language skills in a safe environment, enhancing their confidence and fluency in the target language (Tip 5). To further enhance the learning experience, graduates of the program who are native speakers of Dutch and have successfully completed the medical L2 communication course can be engaged as learning buddies, offering valuable mentorship and feedback from a relatable perspective, along with real-world insights and firsthand experiences. This approach not only provides linguistic support but also helps students understand cultural nuances in medical communication [6, 31] (Tip 6). Additionally, collaborative learning is fostered through peer interaction and shared tasks, promoting both learning and emotional support. This approach allows students to practice their language skills in a supportive environment, enhancing their ability to communicate effectively in the target language (Tip 7). Furthermore, the course leverages multiple feedback sources, including peer, instructor, immediate post-simulation, and simulated patient feedback, to cater to diverse learning preferences and promote both immediate correction and reinforcement of essential skills. This approach supports the development of second language proficiency by providing targeted feedback on language use and communication strategies [45] (Tip 8). These course delivery related advice aim to maximize learning outcomes and prepare students for effective medical communication in real-world settings.

Tip 4: Use interactive and simulation-based strategies to enhance motivation in medical L2 learning

Course designers face the challenge of devising educational programs that effectively stimulate student motivation in second language learning, particularly within the specialized domain of medical communication [38]. Research has demonstrated that highly motivated students are more inclined to immerse themselves in the course material and apply their acquired knowledge in a practical and effective manner, which is essential for achieving proficiency in medical language communication [56].

In the field of second language learning, motivation is often regarded as the driving force behind the success of a course [17]. For medical courses, integrating interactive teaching methodologies that allow students to engage with the language in contexts relevant to their field of study can cultivate a sense of participation and professional relevance, enhancing both medical communication and second language proficiency. Simulation-based teaching and role-playing exercises, which have been highlighted in recent research, present a compelling approach to increasing student engagement [53]. These methods provide students with practical, career-relevant scenarios that align with their prospective professional endeavors, reinforcing their motivation to achieve excellence in medical communication in second language learning.

Action points

Incorporate Simulation-Based Teaching: Use simulation-based teaching methods to create realistic medical scenarios that allow students to practice their second language communication skills in a controlled environment, supporting language acquisition through practical application. This controlled environment balances safety with manageable levels of challenge and stress, creating desirable difficulty that can enhance student engagement and motivation [53].

Implement Role-Playing Exercises: Design role-playing exercises that mimic real-life medical interactions, such as patient consultations and team-based discussions, providing essential practice in using the target language in realistic scenarios. As preparatory activities before more complex simulation-based tasks, role-plays can be implemented more frequently and with lower stakes, helping students apply language skills immediately in the classroom, strengthen motivation through small achievements, and build confidence [54].

Create Relevant Learning Contexts: Motivation changes over time and may differ across learning

activities. Ensure that learning materials and tasks are clearly linked to students' future professional roles and authentic clinical practice to enhance perceived relevance and sustain engagement [38, 53].

Tip 5: Structure role-playing for progressive medical L2 skill development

The integration of role-playing exercises within the curriculum serves as a cost-effective and impactful strategy for simulating authentic real-world interactions, supporting second language acquisition and enhancing medical communication skills [32, 53]. These exercises provide structured opportunities for students to apply and consolidate linguistic and communicative competencies within a controlled yet realistic educational setting. Role-playing aligns with the principles of situated learning, where learning occurs through the social interaction and collaboration inherent in real-world activities [27]. Through simulated consultations, students develop integrated communicative competencies in contexts that approximate real clinical environments [53, 56].

Simulation-based education has been widely recognized as an effective modality for developing clinical communication competence and professional performance in health professions training [9, 22], reinforcing its relevance in medical L2 contexts.

While the optimal number of role-playing sessions may vary depending on institutional structure and learner proficiency levels, repeated and progressively complex exposure is essential. Rather than implementing isolated exercises, role-playing activities should be distributed longitudinally throughout the course. Initial sessions may involve more structured and scaffolded scenarios, followed by increasingly autonomous and complex consultations to promote skill consolidation and transfer.

Action points

Design Structured Role-Playing Exercises: Develop role-playing exercises with clear objectives and guidelines to ensure students are well-prepared to participate and achieve the desired learning outcomes, supporting both medical communication and second language proficiency [53]. Initial sessions should be carefully planned and, where appropriate, partially scripted to provide foundational support. After each role-playing session, facilitate a debriefing where students can discuss their experiences, receive feedback from peers and instructors, and identify areas for improvement [45].

Ensure Longitudinal Integration: Incorporate multiple role-playing sessions across the duration of the course to allow iterative practice and progressive skill development, with gradual increases in

communicative complexity rather than reliance on a single or isolated activity.

Maintain Educational Rigor: Treat each role-playing session with the necessary formality, acknowledging that while it is a simulation, it serves a serious educational purpose. Poorly designed or executed exercises can undermine their educational value, learning atmosphere, and negatively impact learning outcomes [45, 53].

Tip 6: Engage native and nonnative near-peers as learning buddies in medical L2 communication

Engaging graduates of the international medical program who are native Dutch speakers and have successfully completed the medical L2 communication course can substantially enhance the educational experience of current students by offering linguistic modeling and insights into local communicative practices [34]. These individuals, who have demonstrated strong proficiency in Dutch medical communication, can be invited to provide assistance and mentorship, offering a unique perspective grounded in their own learning experience. As learning buddies, they are well-positioned to offer detailed feedback and practical solutions, fostering collaborative relationships that enrich the learning process [54].

The inclusion of near-peer mentors aligns with established research demonstrating the educational benefits of peer-assisted and near-peer teaching in medical education, including cognitive congruence and enhanced psychological safety [28, 44].

In our context, these learning buddies typically include senior medical students in advanced clinical phases or recent graduates of the program. Their role is distinct from simulated patients, as they function primarily as peer mentors rather than role-portrayal actors. Native speakers from the broader community are not routinely involved in this mentoring role.

Through structured interaction, these mentors provide examples of effective Dutch medical communication and share practical strategies for navigating linguistic and professional challenges [43].

Action points

Invite Native and Nonnative Peers in L2 Learning: Invite graduates of the international medical program to serve as structured learning buddies. Native speakers who have demonstrated strong competence in clinical communication and consultation performance can provide authentic linguistic modeling and professional mentorship [34]. Graduates who are nonnative speakers may offer relatable guidance by sharing strategies developed through their own language-learning trajectories,

thereby fostering familiarity, collaboration, and confidence in addressing shared L2 challenges [43]. Facilitate Collaborative and Support: Engage native speaker models in collaborative activities such as group projects and mentorship programs to foster a supportive and inclusive learning environment. This interaction not only enhances student confidence but also promotes a sense of community and shared learning [34, 43, 54].

Tip 7: Structure collaborative learning to support medical L2 communication development

In the context of medical L2 communication courses, student collaboration is a fundamental component of the educational experience. Students often engage in peer interactions, dedicating considerable time to collaborative activities [26]. These interactions are pivotal not only for reinforcing learning objectives but also for providing emotional support, which is crucial for reducing feelings of isolation that may arise during L2 learning [49].

Collaborative learning is particularly effective when students jointly engage in meaningful communication tasks, such as paired role-plays, group preparation of consultation structures, or rotating roles of speaker, listener, and observer. These collaborative dynamics cultivate trust and shared understanding, allowing learners to externalize reasoning, co-construct meaning, and develop communicative routines in realistic clinical context [18, 36].

The effectiveness of collaborative learning aligns with Vygotsky's Sociocultural Theory, which emphasizes the role of social interaction in learning [37]. Through structured collaboration, students can learn from each other's language choices and communicative strategies, gradually strengthening competence and confidence in medical L2 communication [54].

Action points

Design Collaborative Activities: Create structured collaborative activities that require students to work together on shared tasks, such as role-playing exercises [53], group discussions [55], structured peer observation and shared task engagement [54]. Ensure that collaborative activities also provide emotional support and normalize learning challenges in L2 communication [49].

Structure Peer Interaction: Provide clear roles and expectations (e.g., speaker, observer, timekeeper) to ensure collaboration remains purposeful and aligned with learning objectives. Encourage students to articulate what they learned through peer interaction to consolidate learning and deepen understanding [18].

Tip 8: Integrate multi-source feedback to regulate medical L2 communication performance

While collaborative learning (Tip 7) emphasizes co-construction of understanding through shared tasks, Tip 8 focuses specifically on the deliberate design of structured feedback mechanisms that regulate learning and guide performance improvement. Feedback plays a crucial role in guiding student learning and development, particularly within the specialized context of second language medical communication [4]. To address the diverse needs and preferences of international learners, it is important to design a course that integrates multiple formats of feedback. Empirical evidence suggests that varied feedback mechanisms can enhance the educational experience and cater to individual learning preferences [13, 24].

Peer-to-peer feedback can strengthen learning by enabling students to compare approaches, exchange perspectives, and refine language use and communication strategies [26]. Instructor feedback provides expert guidance and standards-based evaluation to support targeted improvement [52]. Immediate feedback after role-plays or simulations can correct misconceptions and reinforce effective strategies while the experience remains salient [55]. In addition, feedback from simulated patients adds a patient-centered perspective on clarity, empathy, and relational communication, enhancing authenticity and relevance [56].

Beyond its regulatory function, structured feedback may also strengthen students' external motivation by clarifying performance expectations, making progress visible, and reinforcing their trajectory toward professional competence in the target language.

Action points

Incorporate Peer-to-Peer Feedback: Design activities that encourage structured peer feedback (e.g., observation checklists, guided prompts), supporting second language acquisition and medical communication development [26].

Provide Instructor Feedback: Ensure that instructors provide regular, specific, and constructive feedback focused on communication effectiveness and language use [52].

Implement Immediate Feedback: Provide debriefing-based feedback after role-plays or simulations to reinforce effective strategies and correct errors in a timely manner [55].

Include Patient Perspectives: Incorporate simulated patient feedback to add a patient-centered perspective on communication behaviors and relational impact [55].

Align Feedback With Learning Strategies: Use feedback tools (written, verbal, or digital) that help

students plan next steps, refine strategies, and strengthen self-regulation [13, 19, 24].

C. Steering learning and continuous improvement

The steering learning and continuous improvement phase focus on sustaining learner development and supporting ongoing refinement of learning strategies tailored to medical L2 communication. Tip 9 emphasizes cultivating a psychologically safe learning environment that supports participation, persistence, and constructive interaction [29, 53, 56]. Tip 10 highlights balancing confidence development with manageable stress through gradual exposure to increasingly complex communication tasks and supportive learning processes [2, 20, 52]. Tip 11 focuses on how external feedback can be internalized through structured comparison and reflection to support self-regulated learning [7, 42, 57]. Finally, Tip 12 addresses transfer of learning by bridging simulated tasks with supervised opportunities to apply L2 communication in authentic clinical contexts [34, 52].

Tip 9: Cultivate psychological safety to support medical L2 communication learning

Course designers should create a learning environment that focus on psychological safety, as suggested by Zheng and Zhang [57]. A positive learning environment is essential for language learning, especially in the context of medical communication, due to the multifaceted nature of peer interactions [54]. These interactions, such as simulated patient consultations, peer role-plays, and peer learning partnerships, provide a safe space for students to develop their communication skills without the risks associated with real-world practice.

The value of peer feedback is not only expected but also crucial in enhancing the learning experience. A safe and supportive environment encourages students to engage in the exchange of feedback, which deepens their understanding and enables them to integrate feedback into practical skills that can be applied in actual clinical settings [30]. This approach is corroborated by recent research, which highlights the importance of a collaborative learning environment in the development of proficient and empathetic medical communication learners [56].

Action points

Create a Supportive Environment: It is especially important for language learning courses to provide a supportive environment, as increasing task difficulty may reduce learner motivation if not adequately scaffolded. Design learning spaces that are safe,

inclusive, and supportive. Encourage students to participate in peer interactions and collaborative activities, such as simulated patient consultations and role-playing exercises [53].

Model Positive Interactions: As educators, model the behaviors and attitudes that you wish to see in your students. Demonstrate empathy, active listening, and constructive feedback to create a positive learning environment [53]. This helps students feel more comfortable using the target language and enhances their communication skills.

Monitor and Adjust: Regularly assess the learning environment to ensure it remains positive and supportive. Solicit feedback from students on their experiences and make adjustments as needed to maintain a conducive atmosphere for learning [30].

Tip 10: Balance confidence, stress, and cognitive load in medical L2 communication training

When designing medical communication courses, it is essential to balance building student confidence with reducing stress, particularly in challenging communication training contexts [21, 39, 41]. The strategic use of peer feedback can strengthen student confidence by providing positive and supportive comments that encourage student performance. This method of feedback is known to enhance self-assurance and promote a constructive learning atmosphere. Implementing role-play and simulated patient consultation activities effectively manages student stress in the context of medical communication [53, 54]. Introducing these activities gradually allows students to develop competence and cultivate a growth mindset in handling complex medical consultation tasks. Constructive feedback, as highlighted by Aslam and Khan [2], can instill a sense of accomplishment and capability in students, which is essential for stress reduction and confidence building.

To address the cognitive load associated with learning tasks, the curriculum should be deliberately paced to prevent cognitive overload, as indicated by van Merriënboer [46]. This pacing enables students to effectively assimilate feedback and develop independent skills. The approach is supported by adaptive control of thought theory and the 4 C/ID models, which advocate for a balanced educational approach that nurtures autonomous competence in medical communication [48, 56].

Action points

Positive Peer Feedback: Peer feedback was often found to be positive, supportive. Increasing the number of peer feedback sessions during the learning period would greatly promote course

engagement and boost students' confidence in their learning [55]. It can help build student confidence and foster a constructive learning atmosphere [21]. Curriculum Pacing and Adaptive Learning: Design the curriculum to prevent cognitive overload by pacing learning tasks appropriately, which allows students to assimilate feedback and develop independent skills effectively [15]. Additionally, incorporate adaptive learning models such as the adaptive control theory and the 4 C/ID models to create a balanced educational approach. These models support the development of autonomous competence in medical communication [48], enhancing both medical communication skills and second language proficiency.

Tip 11: Support internalization of feedback to strengthen self-regulated medical L2 learning

While reflection is embedded throughout the curriculum, this tip specifically addresses the structured internalization of external feedback as a mechanism for self-regulated learning. External feedback functions as a catalyst for internal reflection and performance refinement [57]. Research has shown that specific, timely, and actionable feedback from instructors and peers is particularly effective in guiding students to evaluate their performance and identify areas for growth [42]. This aligns with the principles of self-regulated learning, which emphasize the importance of external feedback in enhancing students' ability to monitor and adjust their learning processes [57].

Research also indicates that students often find external feedback more satisfactory and trustworthy than their own self-reflections [55]. Therefore, it is essential to actively encourage students to seek out external feedback and provide them with structured opportunities to compare their work against established standards and learning objectives. Such comparison enables learners to calibrate self-perceptions with external evaluations and refine their communicative strategies [8, 54].

Action points

Optimize Feedback Practices: Provide specific, timely, and actionable feedback from instructors and peers to help students understand their performance and identify areas for improvement [43]. Actively encourage students to seek feedback from multiple sources, including instructors, peers, and simulated patients, to gain a comprehensive view of their performance [54]. This supports both medical communication skills and second language proficiency by providing targeted feedback on language use and communication strategies.

Enhance Self-Reflection and Learning: Design structured reflection activities, such as reflective journals and self-assessment checklists, to allow students to compare their work against established standards and learning objectives [57]. Facilitate comparison with external evaluations through structured feedback sessions where students discuss their self-reflections and receive input from instructors or peers [7]. Where feasible, incorporate video-based review of simulated patient consultations to support structured comparison between performance, criteria, and feedback, thereby strengthening internalization of learning points. Encourage students to use external feedback to set goals, monitor their progress, and adjust their learning strategies, enhancing their self-regulated learning skills and leading to more effective self-improvement [57].

Tip 12: Facilitate transfer of medical L2 communication from simulation to clinical practice

The goal of medical communication education is to ensure that students can effectively apply their learned medical L2 and communication skills in real-world clinical settings. Transfer of learning, which refers to the ability to use knowledge and skills acquired in one context in another context, is a critical aspect of this process [35]. Research has shown that open learning tasks, which allow students to practice in a variety of scenarios, are particularly effective in facilitating this transfer [53].

Transfer of learning is essential in medical education, as it bridges the gap between classroom-based simulation and authentic clinical environments [27]. Facilitating the transfer of learning ensures that students are well-equipped to communicate effectively with patients and healthcare teams across diverse clinical environments.

Action points

Open Learning Tasks and Bridge Contexts: Incorporate open learning tasks that require students to apply their communication skills in a variety of simulated scenarios, helping them generalize their learning to new contexts [16]. Explicitly connect these simulated tasks to real-world practice through discussions, case studies, and reflective exercises that highlight the relevance of learned skills to actual patient care [56].

Structured Clinical Observation and Supervised Practice: Where feasible and institutionally appropriate, create opportunities for students to observe or participate in supervised clinical encounters conducted in the target language. This may include shadowing clinicians, conducting

selected components of patient interviews under supervision, or engaging in guided bedside communication exercises. Such structured exposure enables students to apply simulated competencies within authentic clinical settings while maintaining patient safety and educational oversight.

Autonomous Learning and Reflective Practice: Encourage students to explicitly map simulated performance to clinical application contexts. Use reflective journals and debriefing sessions to help students identify transferable skills and areas for further development [56]. Encourage students to take ownership of their learning by setting personal goals for skill transfer and monitoring their progress, supported by self-assessment tools and opportunities for independent practice [57].

Challenges and limitations

While this paper presents a comprehensive framework for integrating second language medical communication skills into international medical curricula, several challenges and limitations should be acknowledged. First, balancing authentic learning experiences with manageable cognitive load is crucial. Although whole-task learning and simulation-based teaching methods are advocated, careful calibration of task complexity and the use of scaffolding techniques are necessary to prevent overwhelming students. In addition to pedagogical considerations, practical implementation constraints may influence adoption across institutions. Not all medical programs have access to established simulated patient infrastructures, trained simulated participants, or virtual patient platforms. The development and maintenance of high-quality simulation scenarios require faculty time, training, and financial resources. Similarly, recruiting and sustaining the involvement of graduated native or nonnative near-peer mentors may present logistical challenges due to clinical workload, scheduling limitations, or limited cohort sizes. Institutions with fewer resources may need to adapt the framework by relying more heavily on structured peer role-play, faculty-facilitated simulations, or smaller-scale feedback cycles. Future research should examine scalable and resource-sensitive adaptations to enhance feasibility across diverse educational contexts. Second, while cultural competence is recognized as important, further research is needed to develop culturally sensitive training modules that address diverse patient populations effectively, especially in international regions where patients are not always local. Furthermore, the framework emphasizes the development of direct communicative competence in the local language, which in our context (medical Dutch) is a formal requirement for participation in clinical clerkships. In other multilingual healthcare systems, structured training

in interpreter-mediated consultations may constitute an important component of communication curricula. Although interpreter use is not a central focus of the present framework, future adaptations could incorporate simulation scenarios involving professional interpreters or family-mediated translation where institutional or regulatory conditions necessitate such competencies. Additionally, the framework presented in this paper is grounded in research-informed curriculum development conducted prior to the recent surge of generative artificial intelligence (GenAI) and immersive virtual simulation technologies. While face-to-face simulated patient consultations constitute the primary Concrete Experience in our implementation, emerging digital modalities such as virtual patient platforms and AI-supported conversational systems may offer promising extensions for future iterations of medical L2 communication training. These technologies have the potential to enhance scalability, adaptive feedback, and repeated experiential exposure. However, their pedagogical integration requires careful theoretical alignment with experiential learning principles and empirical validation within medical second-language contexts. Finally, the paper focuses primarily on short-term outcomes, and longitudinal studies are needed to assess the long-term impact on students' career development and patient care outcomes.

Conclusion

The increasing internationalization of the medical profession has intensified the impact of language barriers on patient safety and quality of care [1, 10, 51]. Addressing these challenges requires more than supplementary language courses; it requires structured curricular integration grounded in established learning theory.

This paper contributes a research-informed experiential model that systematically operationalizes Kolb's learning cycle within medical L2 communication education. By integrating whole-task learning, structured multi-source feedback, guided abstraction of communicative principles, and deliberate re-application of refined strategies, the twelve tips provide a theoretically coherent and practically implementable structure for curriculum development. In doing so, the framework clarifies how experiential learning can move beyond abstract theory to guide concrete instructional design decisions in multilingual medical education. The model offers curriculum designers a scalable architecture that preserves conceptual alignment while remaining adaptable to institutional context and resource availability. Future research should evaluate longitudinal transfer to clinical performance, examine implementation constraints across diverse healthcare systems, and explore theoretically aligned integration of emerging digital and simulation modalities. By positioning second language medical communication

as an integrated clinical competence rather than a supplementary skill, this work advances a structured pathway for preparing internationally mobile physicians to practice safely and effectively in multilingual healthcare environments.

Abbreviations

L2	Second Language
ILOs	Intended Learning Outcomes
SPC	Simulated patient consultation
4 C/ID	Four-Component Instructional Design Model

Authors' contributions

H.Y. conceived the paper, developed the initial concept, and drafted the main manuscript text. C.J.M. and M.A. contributed to the development of the educational framework and refinement of the twelve tips. S.E.K. and J.J.G.v.M. provided critical revisions, theoretical guidance, and oversight of the educational content. All authors contributed to manuscript editing, reviewed the final version, and approved the submitted manuscript.

Funding

This project was funded by SURF.nl (project number: OO20-17) and the School of Health Professions Education (SHE) at Maastricht University. H. Y. was supported by a scholarship granted by the China Scholarship Council (CSC, 202008440338).

Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

All students and patients volunteered to participate in the study and signed consent forms. Written informed consents were obtained from all students and simulated patients. All methods were carried out in accordance with relevant guidelines and regulations. The study was approved by the Ethics Review Committee of the Faculty of Health, Medicine and Life Sciences, Maastricht University (FHML-REC/2021/104).

Competing interests

The authors declare no competing interests.

Received: 27 October 2025 / Accepted: 30 March 2026

Published online: 06 April 2026

References

- Al Shamsi H, Almutairi AG, Mashrafi A, S, Kalbani A, T. Implications of language barriers for healthcare: a systematic review. *Oman Med J*. 2020;35(2):e122. <https://doi.org/10.5001/omj.2020.40>.
- Aslam R, Khan N. Constructive feedback and students' academic achievement: a theoretical framework. *New Horiz*. 2020;14(2):175–98.
- Bascom E, Casanova-Perez R, Tobar K, S Bedmutha M, Ramaswamy H, Pratt W, Sabin J, Wood B, Weibel N, Hartzler A. Designing communication feedback systems to reduce healthcare providers' implicit biases in patient encounters. *Proc 2024 CHI Conf Hum Factors Comput Syst*. 2024. <https://doi.org/10.1145/3613904.3642756>.
- Bosher S, Smalkoski K. From needs analysis to curriculum development: Designing a course in health-care communication for immigrant students in the USA. *Engl Specif Purp*. 2002;21(1):59–79.
- Carlsson SV, Esteves SC, Grobet-Jeandin E, Masone MC, Ribal MJ, Zhu Y. Being a non-native English speaker in science and medicine. *Nat Reviews Urol*. 2024;21(3):127–32. <https://doi.org/10.1038/s41585-023-00839-7>.
- Charnetski MD, Wawersik D, Palaganas JC, Duff JP, Bailey SK, Ramachandra G, Birido N, Elkin R, Nair B, Thurber P. Understanding the Effects of Health Care Distance Simulation: A Systematic Review. *Simul Healthc*. 2024;19(15):S57–64. <https://doi.org/10.1097/SIH.0000000000000760>.
- Chou C-Y, Zou N-B. An analysis of internal and external feedback in self-regulated learning activities mediated by self-regulated learning tools and open learner models. *Int J Educational Technol High Educ*. 2020;17(1):55. <https://doi.org/10.1186/s41239-020-00233-y>.
- Cook DA, Hatala R, Brydges R, Zendejas B, Szostek JH, Wang AT, Hamstra SJ. Technology-enhanced simulation for health professions education: a systematic review and meta-analysis. *JAMA*. 2011;306(9):978–88.
- De Moissac D, Bowen S. Impact of language barriers on quality of care and patient safety for official language minority Francophones in Canada. *J patient experience*. 2019;6(1):24–32. <https://doi.org/10.1177/2374373518769008>.
- Diamond L, Izquierdo K, Canfield D, Matsoukas K, Gany F. A systematic review of the impact of patient–physician non-English language concordance on quality of care and outcomes. *J Gen Intern Med*. 2019;34:1591–606. <https://doi.org/10.1007/s11606-019-04847-5>.
- Doyle AJ, Sullivan C, O'Toole M, Tjin A, Simiceva A, Collins N, Murphy P, Anderson MJ, Mulhall C, Condron C. Training simulated participants for role portrayal and feedback practices in communication skills training: a BEME scoping review. *BEME Guide* 86. *Med Teach*. 2024;46(2):162–78. <https://doi.org/10.1080/0142159X.2023.2241621>.
- Er E, Dimitriadis Y, Gašević D. A collaborative learning approach to dialogic peer feedback: a theoretical framework. *Assess Evaluation High Educ*. 2021;46(4):586–600. <https://doi.org/10.1080/02602938.2020.1786497>.
- Flores G. Language barriers to health care in the United States. *N Engl J Med*. 2006;355(3):229–31.
- Frerejean J, van Geel M, Keuning T, Dolmans D, van Merriënboer JJ, Visscher AJ. Ten steps to 4 C/ID: training differentiation skills in a professional development program for teachers. *Instr Sci*. 2021;49:395–418. <https://doi.org/10.1007/s11251-021-09540-x>.
- Frerejean J, Van Merriënboer JJ, Kirschner PA, Roex A, Aertgeerts B, Marcellis M. Designing instruction for complex learning: 4 C/ID in higher education. *Eur J Educ*. 2019;54(4):513–24. <https://doi.org/10.1111/ejed.12363>.
- Gilakjani AP, Lai-Mei L, Sabouri NB. A study on the role of motivation in foreign language learning and teaching. *Int J Mod Educ Comput Sci*. 2012;4(7):9. <https://doi.org/10.5815/ijmecs.2012.07.02>.
- Gorski S, Prokop-Dorner A, Pers M, Stalmach-Przygoda A, Malecki Ł, Cebula G, Bombeck K. The Use of Simulated Patients Is More Effective Than Student Role Playing in Fostering Patient-Centred Attitudes During Communication Skills Training: A Mixed Method Study. *Biomed Res Int*. 2022;2022(1):1498692. <https://doi.org/10.1155/2022/1498692>.
- Hattie J, O'Leary T. Learning styles, preferences, or strategies? an explanation for the resurgence of styles across many meta-analyses. *Educational Psychol Rev*. 2025;37(2):1–26.
- Ilishkina DI, de Bruin A, Podolskiy AI, Volk MI, van Merriënboer JJ. Understanding self-regulated learning through the lens of motivation: Motivational regulation strategies vary with students' motives. *Int J Educational Res*. 2022;113:101956. <https://doi.org/10.1016/j.ijer.2022.101956>.
- Isaksson J, Krabbe J, Ramklint M. Medical students' experiences of working with simulated patients in challenging communication training. *Adv Simul*. 2022;7(1):32. <https://doi.org/10.1186/s41077-022-00230-3>.
- Issenberg BS, Mcgaghie WC, Petrusa ER, Gordon L, D., Scalese RJ. Features and uses of high-fidelity medical simulations that lead to effective learning: a BEME systematic review. *Med Teach*. 2005;27(1):10–28.
- Karlner LS, Jacobs EA, Chen AH, Mutha S. Do professional interpreters improve clinical care for patients with limited English proficiency? A systematic review of the literature. *Health Serv Res*. 2007;42(2):727–54.
- Keiler LS, Diotti R, Hudon K, Ransom JC. The role of feedback in teacher mentoring: how coaches, peers, and students affect teacher change. *Mentor Tutoring: Partnersh Learn*. 2020;28(2):126–55. <https://doi.org/10.1080/13611267.2020.1749345>.
- Kwame A, Petruska PM. A literature-based study of patient-centered care and communication in nurse-patient interactions: barriers, facilitators, and the way forward. *BMC Nurs*. 2021;20(1):158. <https://doi.org/10.1186/s12912-021-00684-2>.
- Lapitan LD Jr, Chan ALA, Sabarillo NS, Sumalinog DAG, Diaz JMS. Design, implementation, and evaluation of an online flipped classroom with collaborative learning model in an undergraduate chemical engineering course. *Educ Chem Eng*. 2023;43:58–72. <https://doi.org/10.1016/j.jece.2023.01.007>.
- Lave J, Wenger E. *Situated learning: Legitimate peripheral participation*. Cambridge University Press; 1991.

27. Lockspeiser TM, O'Sullivan P, Teherani A, Muller J. Understanding the experience of being taught by peers: the value of social and cognitive congruence. *Adv Health Sci Educ*. 2008;13(3):361–72.
28. McMahon CJ, Spooner M, Papanagnou D, Sibbald M, Asoodar M. Twelve tips to train medical students to manage their uncertainty and to provide reassurance to patients and their caregivers. *Med Sci Educ*. 2025;35(4):2187–98. <https://doi.org/10.1007/s40670-025-02402-y>.
29. Molina Roldán S, Maraure J, Aubert A, Flecha R. How inclusive interactive learning environments benefit students without special needs. *Front Psychol*. 2021;12:661427. <https://doi.org/10.3389/fpsyg.2021.661427>.
30. Nayman C, Do J, Goodbaum A, Eady K, Moreau K. The perceptions and experiences of medical students in a pediatric buddy program: a qualitative study. *BMC Med Educ*. 2022;22(1):240. <https://doi.org/10.1186/s12909-022-03306-w>.
31. Nestel D, Tierney T. Role-play for medical students learning about communication: guidelines for maximising benefits. *BMC Med Educ*. 2007;7:1–9. <https://doi.org/10.1186/1472-6920-7-3>.
32. Nicol DJ, Macfarlane-Dick D. Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Stud High Educ*. 2006;31(2):199–218. <https://doi.org/10.1080/03075070600572090>.
33. Nishanthi R. Understanding of the importance of mother tongue learning. *Int J Trend Sci Res Dev*. 2020;5(1):77–80. www.ijtsrd.com/papers/ijtsrd35846.pdf.
34. Peters S, Clarebout G, Van Nuland M, Aertgeerts B, Roex A. A qualitative exploration of multiple perspectives on transfer of learning between classroom and clinical workplace. *Teach Learn Med*. 2018;30(1):22–32. <https://doi.org/10.1080/10401334.2017.1339605>.
35. Randall C. Trust-based observations: Maximizing teaching and learning growth. Rowman & Littlefield; 2020.
36. Scott S, Palincsar A. (2013). Sociocultural theory. https://www.dr-hatfield.com/theorists/resources/sociocultural_theory.pdf
37. Seven MA. Motivation in Language Learning and Teaching. *Afr Educational Res J*. 2020;8:62–71. <https://doi.org/10.30918/AERJ.852.20.033>.
38. Solnick RE, Peyton K, Kraft-Todd G, Safdar B. Effect of physician gender and race on simulated patients' ratings and confidence in their physicians: A randomized controlled trial. *JAMA Netw Open*. 2021;3(2):1–15. <https://doi.org/10.1001/jamanetworkopen.2019.20511>.
39. Somerville SG, Harrison NM, Lewis SA. Twelve tips for the pre-brief to promote psychological safety in simulation-based education. *Med Teach*. 2023;45(12):1349–56. <https://doi.org/10.1080/0142159X.2023.2214305>.
40. Sullivan C, Condron CM, O'Connor L, Pawlikowska T, Murray JM. Their OSCE, not your Oscar: simulated patients' perspectives. *Clin Teach*. 2021;18(6):596–601. <https://doi.org/10.1111/tct.13400>.
41. Sweller J. Cognitive load during problem solving: Effects on learning. *Cogn Sci*. 1988;12(2):257–85. [https://doi.org/10.1016/0364-0213\(88\)90023-7](https://doi.org/10.1016/0364-0213(88)90023-7).
42. Tanveer MA, Mildestvedt T, Skjærseth IG, Arntzen HH, Kenne E, Bonnevier A, Stenfors T, Kvernenes M. Peer teaching in undergraduate medical education: what are the learning outputs for the student-teachers? A systematic review. *Adv Med Educ Pract*. 2023;723–39. <https://doi.org/10.2147/AMEPS401766>.
43. Ten Cate O, Durning S. Peer teaching in medical education: twelve reasons to move from theory to practice. *Med Teach*. 2007;29(6):591–9.
44. van der Kleij FM. Evaluation of the 'Feedback Engagement Enhancement Tool' to examine and enhance students' engagement with feedback on their writing. *Stud Educational Evaluation*. 2020;66:100907. <https://doi.org/10.1016/j.stueduc.2020.100907>.
45. van Merriënboer J. (2023). Learning in simulated and real environments. <https://doi.org/10.26481/spe.20230330jm>
46. Van Merriënboer JJ, Kester L. (2008). Whole-task models in education. In *Handbook of research on educational communications and technology* (pp. 441–456). Routledge. <https://www.taylorfrancis.com/chapters/edit/10.4324/9780203880869-39/whole-task-models-education-jeroen-van-merri%C3%ABnboer-liesbeth-kester>
47. Van Merriënboer JJ, Kirschner PA. (2018). 4 C/ID in the context of instructional design and the learning sciences. In *International handbook of the learning sciences* (pp. 169–179). Routledge. <https://www.taylorfrancis.com/chapters/edit/10.4324/9781315617572-17/4c-id-context-instructional-design-learning-sciences-jeroen-van-merri%C3%ABnboer-paul-kirschner>
48. Walker K, Asoodar M, Rudolph J, Meguerdichian M, Yusuf T, Campbell-Taylor K, van Merriënboer J. Learning practices of experienced healthcare teams and dyads in acute care settings: a scoping review. *BMJ open*. 2022;12(7):e061144. <https://doi.org/10.1136/bmjopen-2022-061144>.
49. Walker K, Asoodar M, Rudolph J, Meguerdichian M, Yusuf T, Campbell-Taylor K, van Merriënboer J. Optimising expert dyad performance in acute care settings: a scoping review protocol. *BMJ open*. 2021;11(7):e047260. <https://doi.org/10.1136/bmjopen-2020-047260>.
50. Wilson E, Chen AH, Grumbach K, Wang F, Fernandez A. Effects of limited English proficiency and physician language on health care comprehension. *J Gen Intern Med*. 2005;20(9):800–6. <https://doi.org/10.1111/j.1525-1497.2005.0174x>.
51. Xie F, Derakhshan A. A conceptual review of positive teacher interpersonal communication behaviors in the instructional context. *Front Psychol*. 2021;12:708490. <https://doi.org/10.3389/fpsyg.2021.708490>.
52. Yu H, Isahakyan A, van Merriënboer JJ, Köhler SE, Asoodar M. Second language learning role-play: effects of patient and doctor roles on motivation and competence. *Front Med*. 2023;10:1163267. <https://doi.org/10.3389/fmed.2023.1163267>.
53. Yu H, Köhler SE, Janesarvatan F, van Merriënboer JJ, Asoodar M. Impact of native and nonnative study partners on medical students' confidence and collaborative strategies in second language medical Dutch Learning. *Med Sci Educ*. 2024;1–11. <https://doi.org/10.1007/s40670-024-02138-1>.
54. Yu H, Li Z, Köhler SE, van Merriënboer JJ, Asoodar M. How do medical students make sense of internal and external feedback to enhance their Dutch communication skills? *BMC Med Educ*. 2025;25(1):256. <https://doi.org/10.1186/s12909-025-06845-0>.
55. Yu H, Xu T, van Merriënboer JJ, Asoodar M. Simulated patient consultations in a second language: the role of open learning tasks in enhancing competence and intrinsic motivation. *Cogent Educ*. 2024;11(1):2426966. <https://doi.org/10.1080/2331186X.2024.2426966>.
56. Zheng B, Zhang Y. Self-regulated learning: the effect on medical student learning outcomes in a flipped classroom environment. *BMC Med Educ*. 2020;20:1–7. <https://doi.org/10.1186/s12909-020-02023-6>.
57. Zimmerman BJ. (2023). Dimensions of academic self-regulation: A conceptual framework for education. In *Self-regulation of learning and performance* (pp. 3–21). Routledge. <https://www.taylorfrancis.com/chapters/edit/10.4324/9780203763353-1/dimensions-academic-self-regulation-barry-zimmerman>

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