On Becoming a Counsellor: Challenges and Opportunities To Support Interpersonal Skills Training

ABSTRACT

Well-developed interpersonal skills are crucial for all social interactions. However, understanding how interpersonal skills are taught or learned, and how technology can play a part in this, is yet an under-researched area in CSCW and HCI research. To start addressing this gap, our research explores the learning processes of counselling students, for whom developing interpersonal skills forms a fundamental part of their university education. We followed an iterative process to gain an in-depth understanding of this context, combining interviews and low-fidelity technology prompts. Overall, 26 participants comprising tutors, students and expert counsellors took part. Our findings first provide insights into the highly collaborative and social learning process of the students. We highlight the complexity of interpersonal reflection as a crucial process for developing counselling skills, and identify the challenges to learning that students face. Second, we build on this understanding to draw out empirically grounded design considerations around opportunities for technology innovation in this setting.

AUTHOR KEYWORDS

Relational Skills; Empathy; Education; Healthcare; Counselling Training; Reflective Design.

ACM CLASSIFICATION KEYWORDS

H.5.m. [Information interfaces and presentation]: Miscellaneous.

INTRODUCTION

The importance of interpersonal skills in our everyday lives has been widely acknowledged [8, 35, 12, 16, 34]. Interpersonal skills are particularly important for mental health professionals such as counsellors and psychotherapists. Indeed, it is the counsellors' interpersonal skill and competence—gained through education, training, and experience—that is considered one of the critical elements for the positive effects of counselling interventions [11, p.29]. However, thus far, no research has yet explored how digital technology could support counselling education, and the interpersonal skills training of students.

As a first step in this direction, this paper focuses on counselling students, for whom interpersonal skills development forms a crucial part of their university education and who have access to established training programs to support them in the learning of such skills. Our research aims to reach a deep understanding of the processes and challenges of how interpersonal skills are taught and learned in counselling; to outline opportunities for technology support; and to offer specific examples of how some of these may translate into technology design.

In the rest of this paper, we report on a study with students and tutors of an under- and postgraduate counselling program at a leading university in the UK over a period of 14 months. We use an iterative process based on a series of interviews and observations (see Table 1 for an overview), with the later phases including low-fidelity prototypes that were employed to deepen discussions with participants and to enhance both their and our understanding of opportunities for technology design in this setting.

We begin with a review of related work and describe how technology has been previously employed for supporting interpersonal skills learning in other settings. Following a description of our iterative research and design process, our findings are then presented in three parts. The first describes the fundamental learning practices in counselling training. We particularly focus on the use of experiential and non-directive learning, and the importance of *interpersonal reflection* in the learning process. Drawing on this understanding, the second part then describes the *key challenges to learning* in this context and identifies a set of four *design considerations* for supporting counselling skills by technology. These include opportunities for (i) non-directively promoting students' reflection processes; (ii) helping in the co-construction of interpersonal interpretation; (iii) scaffolding constructive feedback; and (iv) facilitating iterative, multi-phase reflection over time. In part three, we build on these considerations to guide the development of a design prompt used to further explore and deepen our understanding of the identified challenges and the possible design directions. We conclude by highlighting the complementarity of the interpersonal reflection process with previous works on reflection within CSCW and HCI communities.

CSCW'14,

This paper makes two important contributions. First, we provide a nuanced understanding of how interpersonal skills are taught in this particular counselling setting, and outline the related challenges learners face. Second, we provide empirically driven design considerations for systems to address some of these challenges, and support the learning of interpersonal skills more generally. In doing so, this paper introduces a novel research context for supporting the learning of interpersonal skills, arguing that this is an important but so far under-researched area in CSCW, with wider implications for other contexts in which social and emotional skills learning is relevant.

BACKGROUND

Counselling skills and education

Counselling is part of the psychotherapy profession, with several competing schools of thought that differ in the approach to client and philosophical background (cf. [10]). Interpersonal skills such as the abilities to deeply understand the other, give attention, reflect, listen, or paraphrase, are however at the core of counsellors' training, regardless of the chosen school or training model. In addition, humanistically oriented training such as the counselling program that was the focus of our research, emphasizes the Rogers' three core conditions of a therapist [30]. First is *deep empathic understanding*, when the therapist is 'so much inside the private world of the other that he or she can clarify not only the meanings of which the client is aware but even those just below the level of awareness'. The second is *unconditional positive regard*, during which the therapist experiences a 'positive, acceptant attitude toward whatever the client is at that moment', i.e, accepts the client without judgment or conditions. Finally, *congruence* points to a 'close matching between what is being experienced at the gut level, what is present in counsellor's awareness, and what is expressed to the client', i.e., full authenticity of the counsellor in the interaction [ibid, p. 115].

Approaches to the training of interpersonal skills in counselling have a long history, with a number of manualized training programs that are widely used in practice – such as the Human Relation Training [7], Micro-Counselling [21], Interpersonal Process Recall [23] or the Skilled Helper Model [13]. A large body of literature in psychology has also shown the effectiveness of each of these to promote skill acquisition over the last 30 years – see, e.g., [16] for a recent summary and narrative meta-review.

However, there is very limited work looking at students' actual learning experiences, as opposed to studies measuring 'objective' outcomes of training programs (such as ratio of open/closed questions). Similarly, very little is known about the key challenges for learning interpersonal skills as perceived by students [6, 17], or how technology solutions could be mobilized to support student learning in this regard. **[[Extend this paragraph – add one sentence about the common ground]]**

Technology and interpersonal training in other settings

	Research Phase	Methods	Participants and activities	Length Demographics
UNDERSTANDING THE LEARNING PROCESSES	Phase 1	Semi-structured interview	**Participants:** 5 counselling students **Activities:** • Discussed the main issues students encounter as part of learning • Identified areas to explore in next stages -- practice counselling sessions, and facilitating feedback **Aims:** Design inspiration; understand the basics of the learning process and the key challenges	4 females 1 male Length 45 min
	Phase 2	Observation	**Participants:** 4 expert counsellors, 8 counselling students **Activities:** • Observed practice counselling sessions led by expert counsellor • Observed (and recorded) reflection practices of both student client and expert therapist after the session **Aims:** Design inspiration; understand the practice counselling sessions, and students' reflective abilities	10 females 2 males Length 60 min
	Phase 3	Semi-structured interview Design prompts	**Participants:** 3 members of staff, 3 counselling students **Activities:** • Discussed how learning is scaffolded in class, particularly around practice counselling sessions • Followed by design prompts to envision potential of novel sensing and feedback support technologies **Aims:** Refine design considerations.	5 females 1 male Length 60 min
	Development of the design prompt for Phase 4			
DESIGN EXPLORATION	Phase 4 part 1	Practice counselling session Semi-structured interview	**Participants:** 6 students (3 pairs), each participating in both parts **Activities:** • Practice counselling sessions -- each student took part once as the client and once as the counsellor. • Observe and explore students' reflection practices on recorded counselling session. • Review and critique of the design concept presented through WoZ **Aims:** Confirm identified challenges and design confiderations	5 females 1 male Length 90 + 90 min
	Phase 4 part 2	Wizard of Oz Semi-structured interview		

Table 1. Outline of the iterative design approach – methods and activities for each phase

A large body of work in CSCW and HCI has recently focused on technology support for social skills training for disadvantaged populations. Most of this work has supported people with autism spectrum disorders (see review by Kientz et. al. [25]), and in particular on children with autism with a view to supporting aspects such as basic collaboration (e.g., [28]), core interpersonal acts such as eye-contact or turn taking (e.g., MOSOCO [14]), or self-reliance (e.g., [18]). Outside of the autism domain, researchers have looked at using Virtual Reality systems to support the training of people with anxieties such as Social Phobia (e.g., in [26]), or video-based training of interpersonal skills for parents of children with behavior problems [35].

In contrast, design and research in HCI on the teaching and learning of interpersonal skills for non-challenged populations has so far received only limited attention. Existing work includes, for example, the early exploration of opportunities offered by virtual agents to augment the training of communication skills for medical students [22], inter-cultural communication training for US Army soldiers [9], and automated system to improve non-verbal behavior during work interviews [19].

However, none of these systems embrace the full complexity and mastery of interpersonal skills—such as picking up on subtle feelings and thoughts that might be hidden to the client himself—that are needed and developed within counselling settings.

APPROACH (METHOD & PROCEDURE)

This paper presents findings from a series of interviews and observations that form part of an ongoing collaboration with a counselling degree program in the UK. We aimed to understand how interpersonal skills were taught and scaffolded in counselling training, and the challenges that this may entail generally and for technology design more specifically. We took an iterative, four phase research approach, with each of the stages being analyzed and informing the next (see Table 1 and below for more details). Overall, 3 teaching staff, 4 expert counsellors and 19 counselling students took part in the various research activities[1]. We also drew on our multidisciplinary research team, comprising a counsellor, interaction designer, psychologist and computer scientists.

Phases 1-3: Understanding the design context

In the first phase, we conducted 5 semi-structured, 45 min long interviews with 5 counselling students to explore how they experienced their skills training with a particular focus on their difficulties for learning. Based on these interviews, we identified that so called 'practice counselling sessions' formed an integral, but also the most challenging part in their learning.

In the next, second phase, we thus aimed to gain insights into some of the practical issues that surround 'practice counselling sessions', and to increase our understanding as to how expert counsellors and students reflect on these sessions afterwards. We observed a set of eight practice counselling sessions that involved overall eight students and four expert counsellors (approx. 20 min for each session and 40 min for reflection). Our analysis of these initial two phases led to first ideas for a potential technology design that centered on the development of an online tool to provide students with a wide range of opportunities to reflect, annotate, and receive peer feedback on practice counselling sessions. However, we were not certain which of these might be most relevant and useful for the students, and how these would fit the existing learning processes.

The third phase therefore aimed to elicit critique and comments on our initial ideas, and to gain a better understanding of how such a technology solution would fit into existing learning practices. We conducted semi-structured individual interviews (60 min) with three teaching staff and three master students. Each interview was divided into two parts: During the first, we asked participants to describe their experiences of how counselling skills are taught and practiced, focusing specifically on how students work with recordings of their practice counselling sessions, and their previous experiences of technology use as part of this process. During the second, we then presented our interviewees with a series of design prompts in the form of post cards that visualized different ideas for potential sources for *feedback* (e.g. by tutor vs. other students; opportunities for video annotations; ideas for automatically generated feedback on the interaction dynamic between conversation partners); and offered examples of certain *modalities* for capturing such information (e.g. 1st or 3rd person camera perspective for video recordings; use of a smartphone app vs. physical buttons for providing feedback; use of sensor devices). These cards were used during our conversations to invite discussions as to where, when and to whom this data should be accessible, and also extending our knowledge on some of the specifics of the learning process that were not mentioned previously.

Phase 4: Translating identified challenges into design

Our findings from Phase 3 enabled the refinement of some of our considerations for the design, leading to the development of a low-fidelity design prompt for Phase 4. This fourth phase consisted of interviews exploring the ways in which students reflected on their skills practice in greater depth, and also provided an initial, Wizard of Oz- style testing of our low fidelity prototype. Three pairs of students joined discussion with the researchers, each on two separate days. During the first meeting (90 min), we asked each pair to run two practice counselling sessions with their partner (so that each student took the role of both the client and the counsellor) and then interviewed them separately. As part of the interview, we invited the students to use the video recording of their session to talk us through their usual reflective processes. This led to a set of 6 interviews and 6 practice counselling sessions. For the second meeting (90 min), each student would be individually be invited to discuss their experiences with our design prompt and to share their assumptions and ideas for technology design aimed at supporting their learning process. This phase is described in more detail in the Design Probe Exploration section on p. 8.

Analysis

All collected data from Phases 1 to 4 underwent a two-stage analysis process, whereby the data of each phase was at first analysed individually (to inform preparations for subsequent phases), and then revisited as a whole once the data collection was completed. Our final data set therefore encompasses all audio-recorded interviews which were transcribed, and then included into a systematical thematic analysis following the approach by [5]. To this end, two of the researchers closely familiarized themselves with the data to identify and systematically search for (reoccurring) themes. Identified themes were then coded and higher-level categories developed. Our findings present the key themes that evolved through this analysis. To protect anonymity, participants are referred to using an abbreviation of their role such as a T for teaching staff or S for student, followed by a participant number.

PART 1: UNDERSTANDING THE LEARNING PROCESSES

This section presents our findings around the current teaching processes that mediate learning of interpersonal skills for student counsellors, building mainly on the data gained from Phases 1-3. We start by outlining the fundamental approaches

[1]Altogether 22 females and 4 males participated. This reflects the ratio of females to males in the course. Generally, each participant took part in a single Phase only; with the exception of three students participating in two Phases each.

shaping counsellors' learning, and then focus on reflection practices around the practice counselling sessions.

Fundamental learning practices

Our interviews with staff and students highlighted several core learning practices that were used throughout the counselors' learning. [[We first discuss the underlying values that shape the overall learning approach. We then outline the learning stages that students undergo, with a specific focus on the practice counselling sessions that were presented to us as the main vehicle for the learning of interpersonal skills.]] **[[verbose introductory bit – re-write]]**

Experiential, non-directive learning

Both students and tutors understand the learning process as (a) fundamentally based on tutors' on-going modelling of counselling skills (e.g. being empathic, congruent, respectful to other's experiences) in all their interactions with the students; and (b) strongly shaped by person-centered counselling values of *non-directiveness*, *experiential learning*, and a *focus on here and now*. In particular, both students and tutors referred to the non-directive approach, describing its evolution from a core belief that people learn best if they feel they are understood and that their perspectives are valued by others; rather than simply being told what to do. As such, the learning processes were described by teaching staff as designed to help students directly experience what they learn about, and to deeply engage with and reach new insights about themselves through reflection – helping them to *"push the edge of their awareness"* (T1).

Discomfort as a cue for learning

In addition, teaching staff regarded experiential learning to only happen when students are *"willing to come out of their comfort zone"* (T2). This is particularly important due to their belief that, if one is to learn, *"there needs to be a dynamic moment of feeling off-balance, like a waking up moment"*, during which students learn (T2). This highlights the need for enabling, at least to a certain extent, rather uncomfortable experiences to invite important processes of reflection and thereby the development of interpersonal skills. However, the teaching staff as well as the students frequently emphasized how such interactions had to be facilitated within a 'safe space', where confidence and trust could develop among the students (and the staff). This need for a safe space and mutual respect was also manifested in a 'learning contract' that all students and tutors agreed to, and whose breach would be severely reprimanded.

Learning in stages

Tutors described how they structured activities across the study program to stage the learning of counselling skills. Their goal entailed that students started their training by developing deep self-awareness and reflection abilities, scaffolded for example through sessions that aimed to support students to re-live strong feelings (e.g., shame, loneliness, loss). This was followed by rehearsing core interpersonal skills such as attentive listening, understanding or paraphrasing the other, deliberately practicing each in 'isolation', without being connected to other aspects of the interaction. Only then the students would move onto the key part of the training—practice counselling sessions—where the interpersonal aspects of counselling skills were developed, tried out, and fine-tuned before the students were able to embark on interactions with real clients as part of post-training placement.

Practice counselling sessions: Practice counselling sessions were described as the crucial stage where interpersonal counselling skills are taught in context. Such sessions took place in a 'triad', where three students took on the role of a 'client', 'counsellor' or 'observer'. During the practice sessions, the student in the role of the 'client' was encouraged to talk about a real issue – one that felt important to them and that was not too sensitive to be discussed with the student learner in the role of the counsellor. Frequently however, students reported how 'clients' would bring quite intimate topics to these sessions, such as substance abuse in the family or serious marital and relationship issues.

Participants explained how such practice sessions would be scheduled regularly (e.g., weekly) and that the sessions last between 5-20 minutes, with the duration increasing over time as students' experience with the activity develops. Each session is usually followed by a feedback phase (around 10 minutes long), where the observer, and, at times, also the client or counsellor, would share what they had observed during the interaction. Occasionally, the tutors would join the triad as additional observers and providers of feedback. Moreover, the students commonly rotated in the roles they were taking, enabling each to practice their counselling skills in turn. Some of these triad sessions were further reported to have been video recorded (e.g. 3 to 4 sessions a year) but there were no other reported uses of technology.

The key part of the learning was however described to occur *after* the practice session had finished, when the counselling student would 'process' and reflect on their experiences.

Learning through interpersonal reflection

Reflection and processing of their practice sessions is vital for student counsellors learning. Our interviews and data unpack such reflection process as a complex, inherently social activity: The students aim to deeply understand how their own actions have affected the client's thoughts and feelings; yet these are generally not directly observable and need to be collaboratively established. This leads to a complex interplay between several types of reflection that combine a deep, personal reflection on student counsellors' own experiences with the need for 'interpersonal reflection', drawing on a shared sense-making with others.

In particular, we saw three ways in which such reflection work on a practice counselling session was currently scaffolded: (i) students received *external cues* provided directly after the triad session; (ii) such feedback was then employed to support *self-cued reflection*, when the student reflected on their session repeatedly over time, often at home and alone; and (iii) reflection on selected sessions could be guided through *Interpersonal Process Recall*, which is a structured process to facilitate deep self-awareness of the counsellor.

In the rest of this section, we draw out the benefits and issues with each of the three reflection practices, preparing the ground for a set of design considerations to support students' interpersonal reflection through digital technology. Overall, our analysis suggests that the existing scaffolding of students' reflection is geared to mainly support reflection on the student-counsellors' own internal processes, and only marginally facilitates the focus on the 'client' or on the dynamics of the counselling session, despite their importance.

External cues for counsellors' reflection

Students in the counsellor role highly valued hearing about the client's and observers' experiences of the practice sessions, even if these conflicted with their own perspective. Such external feedback then served as a valuable cue for their reflection. However, students described how there is only a limited support for such detailed interaction with the client and observers after the sessions, mostly due to time concerns.

Both tutors and students described how the 'observers'—i.e., peers and/or tutors watching the practice session—provide most after-session feedback. Observers are expected to provide a specific kind of comments that are tightly bound to what was directly *"observed and seen in practice sessions"* (T1). Tutor 3 has eloquently described it as 'noticing', saying that *"I don't want them to make a judgement about whether it's right, wrong, helpful, unhelpful, but just noticing."* Both tutors and students emphasised how providing constructive feedback from the observers' position is a difficult skill to learn; and that the students they frequently struggle with providing such concrete, non-judgemental, yet constructive feedback. The tutors considered the ability to give good, constructive feedback as an important part of students learning, as well as a method of assessing their development.

In contrast, clients' feedback is rarely elicited, despite the fact that it is felt by students as even more relevant than the one from observers. This is understandable as counselling is *"all about the relationship with the client"* (S12) and, especially when *"you're not experienced, you don't know what the client's experience [was]"* (S3). However, it is currently not very common for clients to share their feedback after the session; and even if they do, it is often only a very high-level overview summary of the session.

Finally, participants highlighted the qualitative difference between feedback from the tutors and peers. The students were often not satisfied with the feedback quality they receive from their peers; but also with the quality of feedback they are able to provide themselves when in the observer's role. The tutors were described as being better able to help students pinpoint areas for future development—an example of constructive feedback—as opposed to students comments being much less specific. Some students particularly highlighted the lack of critical but constructive comments they would receive from peers. For example, Student 1 told us how she dislikes the overly positive comments that are often shared among the group as *"even if it is genuine, I still hate it because I am not getting anything out of it"*. She then continued to say how she would prefer well meant, but critical feedback.

Self-cued reflection

Self-cued reflection is also an important part of the learning process, during which students repeatedly analyse their practice sessions on their own. This mostly happens at home, especially if the session was video recorded. Both students and tutors saw the usefulness of such repeated, deep immersion into the session on video to help students unpick their session in detail and learn from both mistakes as well as accomplishments. While the students saw it as an opportunity to *"work deeply when you see the tape again and again by yourself"* (S6), they also described how there is a very limited support for further interaction with the client and observers during or after self-cued reflection, although the inferences about the others' thoughts and feelings are crucial for students' reflective processes in this stage. This makes it very difficult for them to check whether their own assumptions about the client and observers' experiences are correct.

We now turn to two quotes taken from the first part of Stage 4, to provide an example of the level of detail in which students would reflect on their session and highlight the various aspects students generally paid most attention to.

> *(S15): "I noticed that when she was talking about handing in her MA [. . .] she said, 'That's a really amazing achievement', and there was just like a pause and the slight forcing of her saying she'd had an amazing achievement. [...] I found a pause and was able to say, 'I noticed that you did this. I just wanted to know if you noticed anything?' Then she thought about it and talked it though, and it turned out that she had some difficulty accepting that she'd had an achievement, because of various things that were to do with the support of her husband and stuff. [...] It gave her the option to change the flow of what she was talking about, to get a little bit deeper into acknowledging her own feelings, which is really important. So that's really good.*

> *(S12): It was all about concentrating on not what was said, but what I was doing, my reactions, what were the client's reactions, facial expressions. I thought they are very, very interesting to watch because a smile in the right place, or a frown, or a 'Mmm, mmm.' If the client goes, 'Mmm,' does that mean they are not quite understanding what I am asking, or saying?"*

Both quotes illustrate how students generally paid attention to several interrelated aspects. First, we see a very detailed focus on their own and the client's non-verbal behaviour. While non-verbal behaviour is important also during the session, students often picked up on cues they have not noticed before revisiting the video.

Second, the focus on non-verbals was then combined with attempts to go beyond of what the client has said, and create a deeper understanding/interpretation of why they did what they did. For example, S15 has picked up on his client's subtle hesitations around accepting an achievement and used this to uncover a deeper issue they then spend the session talking about. Similarly, most of the students were using the video to continuously analyse and double-check if they had under-

stood their clients well enough during the session; or if they had missed something crucial. Students always view their interpretations as tentative accounts of clients' experience that need to be verified. Such verification is however not a part of the current training processes.

Third, although noticing new aspects can be perceived as validation/clarification with advanced students when they watch the video (e.g., S15 or S12), it can also raise self-critical attitudes. This was particularly common for early students, as the video highlighted things they believed they had missed, or their own responses they thought they could improve. For example, speaking about the bachelor students, Tutor 3 said *"[T]hey always choose the worst bits and then beat themselves up. They never choose the bits that they do really well and show you that."* Balancing such self-critical attitudes seemed to be another important challenge for the students.

Fourth, counsellors often explored alternative ways of responding to a situation in their minds, especially after identifying a situation they were not happy with. Again, these require them to work with complex assumptions about the clients' possible responses and thoughts, but are not sense-checked with the client later.

'Interpersonal Process Recall' (IPR) – guided reflection

Students are also taught a structured way of reflection, called Interpersonal Process Recall (IPR), as part of their normal learning process. IPR is a traditional technique developed by Kagan [24] in the 1970s, aiming to facilitate counsellors' deep reflection on, and awareness of, their own feelings and thoughts during counselling sessions – i.e., the focus is on their own self-awareness and experience of the sessions, not on the dynamic of the interaction as such. A brief description of the IPR process is below, see [23] for more detail.

IPR draws on the collaborative viewing of a video recording of the session. The counsellor can stop the video at any time of their choice, often when they believe something important has happened. Another student or a tutor then asks the counsellor a question from a list compiled by Kagan. The counsellor then uses this to reflect aloud on what was going on for them at that time. If done according to the guidelines, this is a very long process – e.g., 8 hours of IPR for 1 hour of the videotaped session. As this protocol was originally designed for analysing real-world counselling sessions, the client's view is not supposed to be shared, nor can the clients stop the video at moments they would like to discuss, although they might be present at the IPR session. However, the students saw this as overly restrictive to their learning and told us that for most of the sessions they facilitated (i.e., without the tutor present), the comments would be eventually shared by all involved. The tutors were aware and accepted that such adaptations of the IPR protocol happen, and indicated that they would be open to modify IPR such that would also involve the client to a larger extent.

Overall, the IPR process provides an inherent structure that seemed to support a better focus and the deepening of reflection for students. While this suggests that similar approaches to scaffolding reflection might be useful also for the other reflective practices (such as external feedback and self-cued reflection), the IPR however does not directly support interpersonal reflection. Instead, it focusses on the self-reflection of the counsellor only, with little input from the client or observers, and brings extreme time requirements for all involved.

Effects of video-recording on reflection practices

The inclusion of the video recording markedly changes the perception of the practice sessions for the students. Tutors and students agree that having the video is useful as it provides more opportunities to explore and reflect on their own practice in detail, regardless whether it was to support external cues, the students' own reflection at home, or IPR. Video is understood as providing 'evidence' and specificity to reflection. In other words, by having the option to stop and point out particular moments, it was perceived as helping provide specific, non-judgemental grounds for deep reflection on the part of the student counsellor.

While the students saw the video as beneficial for their learning process, students also told us that they initially felt conscious, vulnerable, and very uncomfortable about the video recording, although they eventually get used to it. Tutors were aware of these challenges for students, but believed that this is an important part of the learning process, and that the benefits outweigh any uncomfortableness whilst doing it. For example, after giving an example of her own experience with video-recorded skills practice (as a student), Tutor 2 told us: *"As soon as you start to get the feedback and you begin to see, 'Oh my God, this is powerful. I'm really learning a lot about myself here', the equipment becomes an aid not an enemy"*.

Video-recording also raises pragmatic concerns that hinder its use for all sessions, as it takes longer to set up, and *"if you're doing short sessions it's not feasible"* (T3). However, tutors are keen to extend the use, and have for example already started including it into bachelors course, with good uptake from the students. For example, Tutor 1 described her experience with using video for second year BA students who *"enjoyed it when they did it. Yes. Terrified of it, of course () they really did get the benefits of it."*

PART 2: CHALLENGES TO LEARNING AND DESIGN

While the practices around the teaching and learning of counseling skills are effective, to the extent that students graduate as counselors, there are also a number of challenges that can point to opportunities for technology support. We first draw out four design considerations for systems aiming to support counselling learning that build on the identified challenges, and outline how these considerations guided the design of the design prompt we used for the Phase 4.

Design considerations to support counselling training

Each of the three key reflective practices highlights particular facets that are crucial for interpersonal reflection, but each is, for pragmatic reasons, used independently in the current learning process. This points to opportunities for technology to combine and support all of these aspects of interpersonal reflection together, as well as to address some of the key challenges present.

In particular, the importance of external cues highlighted the need to include the client and observers in the interpersonal reflection process of the student-counsellor. Self-cued reflection then highlights how counselling students process and learn from their practice sessions over longer periods of time, and thus do so mostly outside of formal learning settings, e.g., at home. The IPR then suggests the benefits of scaffolding reflection non-directively, i.e., providing structure for reflection but keeping the student-counsellor in charge to decide what to focus on and when; and also pointing to the importance of specificity and 'evidence' that a video recording can provide. We now outline four design considerations for systems aiming to support counsellors learning in similar contexts.

(C1) Non-directive facilitation of the reflection process: We already brought attention to the limited scaffolding for interpersonal reflection processes, especially for the counsellors' self-cued reflection outside of the lessons. Technology supporting such reflection should empower students to reflect and make personal choices, rather than directively restrict their experience. Furthermore, designs should aim to facilitate localised reflection, i.e., tying the reflection and feedback to particular moments of the session to provide specificity and 'evidence'.

(C2) Support co-constructing of interpretation with the client: We saw the need for processes or technologies that facilitate a better access to clients' experiences for the student in the role of the counsellor during their reflection process. In particular, technology should facilitate interactions with clients (and observers) to allow counsellors to verify and sense-check the intricate assumptions they may make about their client's feelings, thoughts or behaviours. Further facilitation would be useful to support students in making their reflection work or felt experience more tangible, and thus more suitable for discussion.

(C3) Scaffold constructive feedback from observers: Providing constructive feedback from the role of an observer (or client) is understood as an important but difficult skill that students need to learn but tend to struggle with. In particular, students find it difficult to be concrete enough and link their comments to specific observations; or to provide constructive criticism instead of praise. Technology should aim to facilitate such localised, constructive (i.e., not only positive), but still non-shaming feedback from the observers, as well as support the observer's learning whilst giving feedback, e.g., scaffolding it as a valuable self-reflection exercise.

(C4) Support for iterative, multi-phase reflection: Our data suggests that interpersonal reflection requires a long-term process, combining periods of deep individual sense-making and reflection (including creating assumptions about others' experiences and states), with periods of interactions where such thoughts are shared, checked and discussed. Technology should aim to scaffold such a series of in-depth engagements between the client, the counsellor and the observers, including enough time for deep reflection in between. It is also important to respect and design for the limited time available for the students (as opposed to a full IPR process).

Developing a design prompt: The AffectDial

To design a design prompt for use in Phase 4, we drew on the identified design considerations above, and recognized the value of the video as a data source for reflection. In the scope of this paper, we only focus on one of a series of design prompts that were employed with participants: the AffectDial, as it explores possible design directions to many of our design considerations (C1, C2, C4). The AffectDial is an interactive mock-up prototype that takes the form of a virtual 'slider' on a single line with two poles, where poles can represent any concept that students wish to explore, e.g., from non-empathic to empathic. The student can indicate their in-the-moment experience while they watch a video-recording of their session, by manipulating the slider position by moving the mouse. The sequence of such slider position changes is recorded, time-stamped to tie the changes to the respective time in the video, and can be thus later presented as an overview graph (see Fig. 1).

We envisioned that uses of the AffectDial would support novel reflection practices for the students in several ways. First, asking students to choose a specific concept to analyse could help them prioritise and make conscious decisions about which aspects of their counselling skills they want to specifically focus on. Moreover, we expected AffectDial to promote sustained attention, as the slider position is to be continuously changed according to felt experience. Visualisation of the resulting trace once it has been indicated could further support localised reflection, as it is tied to the video-recording. Altogether, AffectDial was therefore expected to non-directively promote focussed reflection (C1).

Second, we also envisioned that AffectDial could directly promote students' perspective taking and help explore the differences in experiences between client and counsellor. For example, the student can decide to use AffectDial to indicate not their own experience, but their assumptions about how another person feels – e.g., we asked the students in the role of the counsellor to indicate how they believe their client felt as part of Phase 4. Moreover, once such a AffectDial trace is created, it can easily be presented to the client for comments, or compared with the client's own AffectDial trace of the same concept, making it a tangible visualisation of the reflective process. Finally, the time required to provide feedback with AffectDial equals only to the time needed to watch the part of the session to be rated. This is quite time efficient, especially when compared to IPR or similar procedures, and could allow for iterative engagements. As such, we hoped that interaction with the AffectDial would promote co-construction of interpretation through sharing and discussion of felt experiences with the client (C2), and do so by facilitating an iterative, multi-phase engagement with the data (C4).

PART 3: DESIGN-LED EXPLORATION

In Phase 4 of our research process, participants were invited to explore the AffectDial. Following their engagement in a practice counselling session, we first let the participants explore the AffectDial in conjunction with their video recording and to discuss their experiences with one of the researchers. We then explained and guided participants through available as well as envisioned functionalities of this design prompt, asking for their thoughts and input.

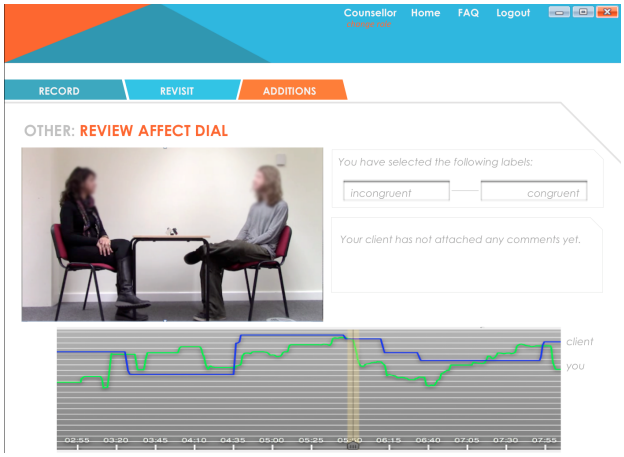

Figure 1. Visualisation of the AffectDial traces, connected with the video, as presented during the Wizard of Oz (Phase 4).

We prepared a specific sequence of interactions with the AffectDial that we asked students to do. These aimed to explore the combination of explicit perspective taking (i.e., counsellor indicating their assumptions about client's experience) and facilitated sharing of experience between the student-client and counsellor via the Affect Dial trace.

In particular, we first asked the counsellor to decide on a concept they would like to ask their client to feedback on with the AffectDial (e.g., how anxious the client felt). The counsellor also chose a 5-10 minute long fragment from the session they've just finished, to specify which part of the session the client was asked to watch and thus give feedback on. We then passed this information to the client, who was in a different room, and who used the AffectDial to indicate their experiences regarding the chosen concept on that fragment. Independently, the counsellor rated the same fragment and concept, but *from the perspective of the client*, e.g., indicating how anxious he/she thinks the client was at moment. The two traces were thus recorded independently, but when brought together, this allowed the counsellor to compare the AffectDial trace visualising their own assumptions of how, e.g., anxious the client was, with the trace indicating the felt anxiety directly by the client.

We then presented the counsellor with the overview of both AffectDial traces and let the counsellor explore and compare these. The traces were connected to the video recording and counsellors could easily move to and review moments in the session they found interesting (see Fig 1). We recorded such interaction with the AffectDial for each of the six practice counselling sessions in Phase 4. The following presents the findings from this process.

Students' responses to the AffectDial

All six students found the slider interaction understandable, and were able to decide upon a concept they would like their client to feedback on. The chosen concepts ranged from selecting one of the core Rogers' conditions such as felt empathy or congruence, to more specific concepts such as 'positively to negatively challenged' or 'helpful to unhelpful facilitation'.

Students shared with us that—by limiting their attention to a single facet of the experience and continuous manipulation with the slider—the interaction with the AffectDial often facilitated a state of heightened awareness just for behaviours around the selected concept (without distraction by other aspects). This was described as a novel and pleasant experience for many students. For example, S15, who was indicating 'challenging responses', explained: *"I'm not really focussing on any of that [other aspects], I'm just focussing on the flow into whether I'm going to challenge or not and when there's a right pause, or whether I've missed it. That's quite interesting, just to go through that experience and be so focussed. [...] Because it's [usually] so heady, it's so cerebral and sometimes overwhelming, it's not something that I've really experienced, the breaking down into just one aspect. To do that was quite refreshing."*

Importantly, comparing their own and the client's trace helped students identify very specific moments they wanted to explore further. These were particularly moments where the two traces did not match (e.g., the client indicated a sharp position change of the slider while the counsellor did not) and thus the counsellor felt to may have misunderstood the client. Once the students returned to such moments (by re-watching the relevant part of the video), we saw them often re-frame their previous understanding of the situation. For example, S11 asked to revisit a particular fragment where her client indicated a drop in perceived helpfulness, but S11 did not. After revisiting the video, she shared: *"I think what happened there is [that] all I did then in my response was just copy, paraphrase of what she said, but that's it; I didn't do anything with it, I just reflected it. I think [she] needed a little bit more of something from me. [...] If I'd just watched that back, I wouldn't have picked that up."*

Students also often suggested that, as a next step, such pinpointed moments and the re-framing they made are something they would have liked to take further and discuss with their client face-to-face. In other cases, for example when the traces did match remarkably, this served our students as a useful validation, i.e., that the assumptions they had were consistent with what the client experienced – which is something the students said they didn't have access to before. Similarly, the overview mode at times highlighted particular moments to look at for the counsellors even before seeing client's data, i.e., the overview showed some aspects they were not aware of when doing the reflection-in-the-moment.

Although the AffectDial functionality generally received a very positive response, students highlighted concerns related to potentially hurting the feelings of the counsellor after the feedback is exchanged, e.g., if the client was to indicate they perceived no empathy in a particular moment. While no such occasion arose during the six interactions we recorded, there is a clear need to ensure mechanisms are in place to safeguard practice; such as the opportunity to discuss the indicated traces in person soon after exchanging and/or opportu-

nity to provide more detailed written explanations for parts that might perceived as hurtful.

DISCUSSION

Learning how to develop sophisticated interpersonal skills is a critical but challenging part of studying to be a counselor. Participants in our studies painted a nuanced picture of their learning processes, and the importance of interpersonal reflection practices to learn counselling skills. In this section, we discuss how these findings might inform the design of systems to support learning of interpersonal skills in the counselling setting.

Specifics of 'interpersonal reflection' in counselling

Our findings show how learning of interpersonal skills in counselling is an inherently social endeavour, building on a complex interplay of interpersonal reflection processes around practice counselling sessions, and involving multiple actors. In other words, we saw that although the student in the role of a counsellor might do most of the reflection work, the reflection process cannot be fully completed by any one participant alone. The client and possibly observer(s) need to partake and share their perspectives to jointly co-construct the interpretation of the session, and this is needed for the learning to take place. As such, the focus on the 'interpersonal' comes in several variants – the activity itself, the skills that are learned and thus reflected on, and the interactions between the counsellor, the client, and observers in the processing stage after the practice session. As highlighted by the suggested design considerations, systems aiming to facilitate counselling learning will need to take into account, and provide support for, all these aspects of interpersonal reflection.

This presents an interesting reflection case that is complementary to existing reflection research in CSCW and HCI. The majority of such work aims to cue or facilitate reflection on individuals' reflection (e.g., [31, 33, 36, 20]) supporting people to become more thoughtful about their everyday experiences. In contrast, the understanding of reflective processes as a collaborative social activity is relatively rare [15, 29], and is arguably an area ripe for more detailed study [2]. Further exploration of the interpersonal reflection processes, which we saw as crucial for counsellors' learning, could thus contribute to this increasing interest to explore technology support for social reflection, as a relevant part of learning and sense-making in other social situations.

Returning to the design consideration

Building on our experiences across the Phases 1-3 of this research project, we drew out four design considerations to support interpersonal reflection, which were then further explored in Phase 4 with a design prompt. We now return to these considerations to discuss the broader implications and opportunities for technology, using the experiences with AffectDial to ground our observations.

Non-directive facilitation of the reflection process

One promising option to non-directive facilitation is to support the learner in focusing their attention to specific aspects of the interaction. For example, the structure 'enforced' by AffectDial—i.e., the need to choose and focus on a single concept while watching the video—led to very deep and focused reflection, while keeping control over the content in the hands of the counsellor. Similarly, the ability of technology to allow for easy re-structuring and novel viewpoints on data, such as the real-time indication combined with a post-hoc overview, can further support a focussed reflection process. Moreover, prior HCI work (e.g., [27, 33]) suggest the possibility of using sensor or video-based data to provide people with novel cues for reflection and learning. Such cue-based support could again help to focus attention and empower students to explore novel interpretations of their and others' experiences. In particular, the recent advances in detecting relevant social signals such as non-verbal mimicry [3, 37] could be a promising avenue to explore in future work.

Support co-constructing of interpretation with the client

We saw that understanding of others' perspectives and feelings is a core aspect of counsellors' learning, but that the counsellor is unable to reach that understanding without including the others into the reflection process; this is an endeavour that often requires large commitments from all involved. As one possible approach, by helping make participants' reflection work or felt experience more tangible, technology could support counsellors in identifying, challenging, and testing their own assumptions about the other's experiences. For example, the perspective taking exercise with the AffectDial not only provided a visible trace of a particular facet of the client's lived experience, but also allowed the counsellor to visualise and directly compare her own understanding of what the client could have been feeling. While such a single slider trace cannot encompass the full complexity of the counselling interaction (a problem likely shared by any technology tool in this space), it still seemed to allow the counselling student to either 'validate' their understanding, or pinpoint specific moments where misunderstandings were more likely to occur. Once such specific moments were found, the students used these to improve their understanding of the interaction. Moreover, they believed such moments could provide good grounding for further discussion, and thus help the counsellor and their client to jointly re-frame their interpretation and understanding of the interaction.

Scaffold constructive feedback from observers

We suggest that technology can help scaffold the 'noticing' process for the observers, supporting them in providing more specific and non-judgemental feedback, but also facilitate the learning of their feedback-giving skills. For example, mobile or wearable technology could be used to help student observers ground their observations to specific moments within the session on-the-fly, such as allowing them to 'tag' situations they would like to comment on while observing the session. Not only would this be a useful, grounded feedback for the counsellor, but also the act of tagging such situations could provide material for a more specific reflection and learning on the part of the observer.

Moreover, the distancing nature of technology, especially when used to provide feedback remotely, could be utilised to facilitate more 'honest', constructively critical interac-

tion. For example, we would expect observer feedback given through AffectDial to work this way, as it: (i) asks the observer or client to non-verbally indicate their own personal experience, and as such it is not felt directly as a judgement of the counsellor; and (ii) the act of requesting such information alone includes an implicit 'permission giving', as the counsellor is the one to select the concept in question and the part of the session to be looked at. Still, designs using such mechanisms need to put safeguards in place (e.g., allowing the counsellor to give 'feedback on feedback' back to the observer) to make sure that the interaction stays constructive, and that any misunderstanding or hard feelings are promptly talked through.

Support for iterative, multi-phase reflection

Asynchronous interaction, such as various forms of focussed 'requests for feedback' sent by the counsellor to the client, could prove particularly useful to support the long-term, multi-phase interpersonal reflection process. Such asynchronicity allows the individual students to engage with the sessions at the time of their choice, and provides an opportunity for the counsellor to carefully select the parts of the session they are particularly interested to focus on. We envision that such a series of asynchronous, iterative interactions would help identify a set of key discussion points, leading to a more in-depth and focussed face-to-face engagement to jointly interpret and discuss differences in viewpoints. This is again exemplified in the interaction we staged as a part of such a process with the AffectDial, where the counsellor first reflected to select both the concept they were interested in as well as the part of the session to be looked at by the client. Once the request had been fulfilled (a relatively easy and quick activity for the client), the counsellor received useful data to further guide their own reflection, often leading to a focussed set of points they would like to discuss with the client in more detail at a face-to-face meeting.

Limitations

The majority of our participants were women, which could suggest possible gender bias in the interview data. However, such reflects the gender ratio of students in the counselling training course we worked with. We did not observe difference in the responses to the interviews or design probes that could be directly attributed to gender. More generally, this project is exploratory research aimed at gaining an in-depth understanding of existing counselling practices to inform technology design. To this end, our research activities involved and re-invited a selection of counselling students and tutors of one particular degree program. **[[Possibly add: This puts limitation on strict generalisability claims that might come from different research paradigms such as controlled experimental studies with randomly sampled courses and students.]]** As is however common in qualitative research **[[[refs]]]**, such continued and indepth involvement with our participants enabled us to gain rich insights into the particularities of this design context and associated challenges, which can translate to similar design contexts (e.g., as per the next section).

Broader implications – social skills learning

The lessons from the counselling context can also inform and inspire a broader agenda looking at social and emotional skills learning in other settings, such as training for medical staff [1, 34], leadership [4], and increasingly also school education [12]. These are all areas where development of interpersonal skills is also crucial, and where similar sets of learning approaches are being used, including experiential learning and the need for interpersonal reflection [39]. As specific examples, curricula aiming to teaching skills such as empathy, awareness of own and other's emotions, or perspective taking are increasingly rolled out across primary and secondary schools within the US [12, 38]. Similarly, there is an established need in the medical community for an increase in support for training communication skills and empathic interaction for medical staff across all roles [1, 32, 34] – including students, practicing doctors, and nurses.

As all these programs use very limited technology so far, this opens questions if and how could CSCW and HCI support the social and emotional learning in these settings, and whether the findings around the opportunities to support counsellors' learning here could serve as a good starting point.

CONCLUSIONS

This work presents a first exploration into the role digital technology could play in supporting the learning of interpersonal counselling skills. We present a nuanced understanding into how such skills are taught as part of a humanistically oriented counselling degree program, highlighting the challenges to learning students currently face. These revolve mainly around the need to better support interpersonal reflection processes, which are crucial for the student learners. Drawing on our interviews, observations and the design prompt, we offer four design considerations for systems aiming to mediate such challenges. Overall, our findings point to the potential for technology to enhance and support the learning of interpersonal skills in counselling training, and possibly also other settings, and provide an important first step for future research in this direction.

ACKNOWLEDGEMENTS

Blank for review

REFERENCES

1. J. Barth and P. Lannen. Efficacy of communication skills training courses in oncology: a systematic review and meta-analysis. *Annals of oncology*, 22(5):1030–40, May 2011.

2. E. P. S. Baumer, V. Khovanskaya, M. Matthews, L. Reynolds, S. Sosik, and G. K. Gay. Reviewing Reflection : On the Use of Reflection in Interactive System Design. In *DIS'14*, 2014.

3. S. Bilakhia, S. Petridis, and M. Pantic. Audiovisual detection of behavioural mimicry. In *ACII'13*, 2013.

4. J. E. Bono, R. K. Purvanova, A. J. Towler, and D. B. Peterson. Survey of Executive Coaching Practices. *Personnel Psychology*, 62(2):361–404, June 2009.

5. V. Braun and V. Clarke. Using thematic analysis in psychology. *Qualitative research in psychology*, (February 2013):37–41, 2006.

6. H. Bulpitt. Learning about reflection from the student. *Active Learning in Higher Education*, 6(3):207–217, Nov. 2005.

7. R. R. Carkhuff. *The art of helping*. Human Resource Development, 1972.

8. J. Cohen. Social, emotional, ethical, and academic education: Creating a climate for learning, participation in democracy, and well-being. *Harvard educational Review*, 76(2):201–237, 2006.

9. M. Core, D. Traum, H. C. Lane, W. Swartout, J. Gratch, M. van Lent, and S. Marsella. Teaching Negotiation Skills through Practice and Reflection with Virtual Humans. *SIMULATION*, 82(11):685–701, Nov. 2006.

10. D. Coyle, G. Doherty, M. Matthews, and J. Sharry. Computers in talk-based mental health interventions. *Interacting with Computers*, 19(4):545–562, July 2007.

11. B. Duncan, S. Miller, B. Wampold, and M. Hubble. *The heart and soul of change: Delivering what works in therapy* . 2nd edition, 2010.

12. J. A. Durlak, R. P. Weissberg, A. B. Dymnicki, R. D. Taylor, and K. B. Schellinger. The impact of enhancing students' social and emotional learning: a meta-analysis of school-based universal interventions. *Child development*, 82(1):405–32, 2011.

13. G. Egan. *The skilled helper: A problem-management and opportunity-development approach to helping*. Cengage Learning, 10th edition, 2013.

14. L. Escobedo, D. H. Nguyen, L. Boyd, S. Hirano, A. Rangel, D. Garcia-Rosas, M. Tentori, and G. Hayes. MOSOCO: a mobile assistive tool to support children with autism practicing social skills in real-life situations. In *CHI '12*, page 2589, New York, New York, USA, May 2012. ACM Press.

15. R. Fleck. Rating reflection on experience: A case study of teachers and tutors reflection around images. *Interacting with Computers*, 24(6):439–449, Nov. 2012.

16. C. E. Hill and R. W. Lent. A narrative and meta-analytic review of helping skills training: Time to revive a dormant area of inquiry. *Psychotherapy (Chicago, Ill.)*, 43(2):154–72, Jan. 2006.

17. C. E. Hill, C. Sullivan, S. Knox, and L. Z. Schlosser. Becoming psychotherapists: Experiences of novice trainees in a beginning graduate class. *Psychotherapy (Chicago, Ill.)*, 44(4):434–49, Dec. 2007.

18. H. Hong, J. G. Kim, G. D. Abowd, and R. I. Arriaga. Designing a social network to support the independence of young adults with autism. In *CSCW '12*, page 627, New York, New York, USA, Feb. 2012. ACM Press.

19. M. E. Hoque, M. Courgeon, J.-C. Martin, B. Mutlu, and R. W. Picard. MACH: My Automatic Conversation Coach. In *Proceedings of the 2013 ACM international joint conference on Pervasive and ubiquitous computing - UbiComp '13*, page 697, New York, New York, USA, Sept. 2013. ACM Press.

20. E. Isaacs, A. Konrad, A. Walendowski, T. Lennig, V. Hollis, and S. Whittaker. Echoes from the past: how technology mediated reflection improves well-being. In *CHI '13*, pages 1071–1080, New York, New York, USA, 2013. ACM Press.

21. A. E. Ivey. *Microcounseling: Innovations in interviewing training.* Charles C Thomas, 1971.

22. K. Johnsen, A. Raij, A. Stevens, D. S. Lind, and B. Lok. The validity of a virtual human experience for interpersonal skills education. In *Proceedings of the SIGCHI conference on Human factors in computing systems - CHI '07*, page 1049, New York, New York, USA, Apr. 2007. ACM Press.

23. N. Kagan. Interpersonal process recall: Basic methods and recent research. *Teaching psychological skills: Models for giving psychology away*, pages 229–244, 1984.

24. N. Kagan, P. Schauble, A. Resnikoff, S. J. Danish, and D. R. Krathwohl. Interpersonal process recall. *The Journal of nervous and mental disease*, 148(4):365–374, 1969.

25. J. A. Kientz, M. S. Goodwin, G. R. Hayes, and G. D. Abowd. Interactive Technologies for Autism. *Synthesis Lectures on Assistive, Rehabilitative, and Health-Preserving Technologies*, 2(2):1–177, 2013.

26. E. Klinger, S. Bouchard, P. Légeron, S. Roy, F. Lauer, I. Chemin, and P. Nugues. Virtual reality therapy versus cognitive behavior therapy for social phobia: A preliminary controlled study. *Cyberpsychology & behavior*, 8(1):76–88, 2005.

27. D. McDuff, A. Karlson, A. Kapoor, A. Roseway, and M. Czerwinski. AffectAura: an intelligent system for emotional memory. In *CHI '12*, page 849, 2012.

28. A. M. Piper, E. O'Brien, M. R. Morris, and T. Winograd. SIDES: a cooperative tabletop computer game for social skills development. In *CSCW '06*, page 1, New York, New York, USA, Nov. 2006. ACM Press.

29. M. Prilla and K. Knipfer. Computer support for collaborative reflection on captured teamwork data. In *ECSCW'13*, number 257617, pages 56–61, 2012.

30. C. R. Rogers. *A way of being*. Houghton Mifflin Harcourt, 1980.

31. C. Sas and A. Dix. Designing for reflection on personal experience. *International Journal of Human-Computer Studies*, 69(5):281–282, 2011.

32. J. M. Satterfield and E. Hughes. Emotion skills training for medical students: a systematic review. *Medical education*, 41(10):935–41, Oct. 2007.

33. A. Stahl, K. Höök, M. Svensson, A. S. Taylor, and M. Combetto. Experiencing the Affective Diary. *Personal and Ubiquitous Computing*, 13(5):365–378, June 2008.

34. K. A. Stepien and A. Baernstein. Educating for empathy. A review. *Journal of general internal medicine*, 21(5):524–30, May 2006.

35. S. Strathie, P. Forsyth, H. Kennedy, M. Landor, and L. Todd. *Video Interaction Guidance: A relationship-based intervention to promote attunement, empathy and wellbeing*. Jessica Kingsley Publishers, 2011.

36. A. Thieme, J. Wallace, J. Thomas, K. Le Chen, N. Krämer, and P. Olivier. Lovers' box: Designing for reflection within romantic relationships. *International Journal of Human-Computer Studies*, 69(5):283–297, May 2011.

37. A. Vinciarelli and M. Pantic. Bridging the gap between social animal and unsocial machine: A survey of social signal processing. *IEEE Transactions on Affective Computing*, 3(1):69–87, Jan. 2012.

38. K. Weare and M. Nind. Mental health promotion and problem prevention in schools: what does the evidence say? *Health Promotion International*, 26(S1):i29–i69, Nov. 2011.

39. J. E. Zins and M. J. Elias. Social and Emotional Learning: Promoting the Development of All Students. *Journal of Educational and Psychological Consultation*, 17(2-3):233–255, July 2007.