



Future Digital Challenges: Social-Emotional Skills as Critical Enablers for Good Technical Design Work

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Abstract. Technology is becoming increasingly entangled in all aspects of our lives often with unintended negative consequences. While there is increasing recognition of the ethical and value-based aspects in our technology design work, and while there is increasing support for the multidisciplinary collaborations needed to address current and future challenges, little focus has been put on the skills needed by people practically engaging in this work. Good technical and design skills are necessary but not sufficient. We also need good social-emotional-ethical skills, with implications for education, collaborations, and leadership development.

Keywords: Digital futures · Social-emotional skills · Soft skills

1 Introduction

The INTERACT2021 theme concepts of ‘sense, feel, design’ can well be interpreted from the perspectives of how devices can sense human activity or how new multi-sensorial experiences can be enabled for people through technologies; indeed both perspectives raise interesting possibilities for next generation technology design. There can however also be another interpretation that turns these concepts back on to us as the researchers, designers, engineers, etc., who are involved in producing these technologies and the increasing importance of the social and emotional (SE) intelligence skills [4, 13, 14] needed to engage in this work. In particular ‘sense and feel’ can suggest core SE skills of self and other awareness, related to emotions, empathy and perspective taking. ‘Design’ can suggest how we actively regulate our own emotions and reactions, how we respond to setbacks and difficulties, and how we manage effective empathic interpersonal interactions to communicate effectively, collaborate, negotiate conflict and so on. It is also about values and how we critically engage with complex ethical challenges, and how we creatively approach the hard problems we are needed to solve – this latter is also often referred to as ethical or spiritual intelligence and is included in SE skills learning.

1.1 Motivating the Importance of Social-Emotional-Ethical Skills for Design

Why are these skills so important to the design of technology? Because computer science and Human Computer Interaction (HCI) have well moved on from a simple focus of what goes on ‘inside the box’ or how a screen interaction takes place (if it were ever this simple). Now technology is implicated in every aspect of our daily lives and of society, bringing with it complex socio-technical-ethical challenges. A 2008 report from a 2007 Microsoft workshop with leading Human Computer Interaction (HCI) scholars [10] presciently points to these changes and the challenges for HCI. The report asks the question, “what will our world be like in 2020 [recognizing that] digital technologies will continue to proliferate, enabling ever more ways of changing how we live” (p. 10) and argues that we are not just designing technologies but designing “being human” and so needing to put “human values centre stage”. In the intervening years we have seen these changes advance, and indeed as HCI researchers and practitioners we have been instrumental in these changes, beyond what we could have even imagined and often with unexpected and undesirable consequences. We’re not just building technology, we’re fundamentally impacting what it means to be human, whose faces and voices matter, what is society, and, as we have recently seen across world politics, what is democracy.

These complex socio-technical-ethical challenges truly fit the definition of ‘wicked problem’ [18], with no right or wrong answer, shaping the problem as we explore solutions, negotiating among multiple stakeholder concerns and so on.

I applaud the response to these challenges from the broader computing community to date. There is an increasing turn to taking seriously issues of ethics and values around computing, as seen in the updated ACM Code of Ethics and Professional Conduct [1], the IEEE standard for addressing ethical concerns in system design [11], and various work on values in software engineering, e.g., [22]. HCI also has a long tradition around these concerns, as reflected in the 2008 report previously discussed, and in approaches such as value-sensitive design in HCI [9] and values in computing workshops [6]. And there is a growing number of initiatives and funding schemes that recognize the complexity of these challenges and the need to bring together multiple disciplines to address them, e.g., as exemplified in the Vienna Digital Humanism initiative [20] and the Swedish Digital Futures centre [5].

Frauenberger [7] further encapsulates these concerns in arguing for a new paradigm of ‘Entanglement HCI’ that moves beyond user centredness and situatedness to recognising the fundamental entanglement of technologies and people and society in ways that are mutually constitutive. In taking this relational view, he argues we are not designing things or interactions but designing the relationships with the things we create.

But there is an elephant in the room – us. The rhetoric often focusses on the aspirations and issues, or on the ‘whats’ of what we are producing, with values and ethics somehow treated as external properties to be handled. But what is the practical human interactional work of achieving these aspirations? Who are the ‘we’ that is doing this work? And this is where there is a real skills gap.

How can we effectively work together in teams with people from diverse disciplines? Who do we negotiate the interpersonal and inter-disciplinary conflicts and challenges of multidisciplinary work, or understand the perspectives of diverse potential stakeholders,

and negotiate among these perspectives? How will we deal with complex ethical trade-offs? How do we operationalise values, and whose values, in technology? How do we practically engage at multiple levels of scale, and across diverse domains? How do we still make ‘good enough’ decisions when we don’t know what we don’t know? How do we identify and weigh the trade-offs of every decision or understand consequences and for whom? How will we deal with uncertainty and failure? And so on.

These are fundamentally human and relational challenges. If we are to properly engage in this work, we need to recognize that core disciplinary skills, core technical and design skills, are necessary but not sufficient for addressing these challenges. The really critical skills will be the so-called soft skills, the social and emotional skills, for example, of being self-aware, being able to manage emotions, being a good communicator and collaborator, being able to see the perspectives of others, being critical thinkers and reflective practitioners. The sensing, feeling and designing skills.

2 Taking Social-Emotional-Ethical Skills Seriously – Challenges

If we take this perspective seriously, it raises a number of challenges¹ for us going forward.

The *first challenge* is nomenclature, and naming these as the essential skills for the ‘we’ – computer scientists, designers, researchers etc., – engaging in this work. This shift can help put the focus on their core importance rather than as an optional ‘nice to have’ [21].

The *second challenge* is around education. We are educating the future ‘we’ who will be solving the complex digital-societal challenges and we need to adequately equip them with future work skills. Reinforcing the importance of SE skills for the future of work, the World Economic Forum has identified top work skills needed in 2025, with eight out of ten top skills, and the top six, related to problem solving, self-management, and working with people, all social-emotional skills [23]. Social-emotional skills are also critical for their learning experiences, as noted by Luca and Tarricone who show “a compelling relationship between students’ emotional intelligence and their ability to work effectively within a team” [15].

How can we better embed the development of these skills across all courses? Examples of such initiatives include: the ‘Ways of Thinking’ course for first year computer science students, developed to replace an introductory HCI course [8] to be able to engage more critically with the implications of their software/design choices; teaching students self-regulation skills to improve programming outcomes [12]; practicing mindfulness with software engineering students to create better conceptual models and improve productivity [3]; and better scaffolding students in support of collaborative group work with structured team-building activities – in our own recent course facilitation we have developed a teamwork module building on Team Playbook tools offered by software company Atlassian [2], complemented with exercises for students to better understand their own values and strengths, and how they could best contribute to teamwork.

¹ Many of these are also reflected in Paula Kotze’s keynote address at INTERACT2019, ‘Is HCI/UX Ready for the Fourth Industrial Revolution?’.

The *third challenge* is around our multidisciplinary collaborations and projects to address these new societal technology challenges. Working with people who are different, whether it is by discipline or culture or life experience or personality and so on, is inherently difficult [19]. It requires strong interpersonal and communication skills to deal with conflicts and differences of opinions and perspectives that will necessarily arise. But research suggests that benefits of doing this are manifold, from more creative solutions to improved performance [ibid].

The *fourth challenge* is leadership development, recognizing the importance of academic leaders at all levels in role-modelling good social-emotional-ethical skills and bringing out the best in their diverse teams [16]. In the top ten skills identified by Google research [17] about what makes a great manager of the best teams at Google, good technical skills only came in at number 8 and almost all of the other skills were around self-regulation, communication, and working with people.

For those of us in any leadership role, the real challenge then is how do we develop our own social-emotional-ethical intelligence skills if we are to address the other three challenges and contribute to creating digital futures that fit with human values.

3 The Call

Good social-emotional-ethical skills will increasingly become the enabler, the fuel, for doing good technical and design work.

It is time we took these essential human skills more seriously for ourselves, for our students and collaborators, and for the sake of our technology-enabled futures.

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