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Making new technology understandable through multimodal instruction: A digital mobility stick in customer training interaction

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Abstract

With a variety of smart technologies on the market, health technologies have become an increasingly everyday phenomenon. This paper focuses on customer training in the use of a new technological device, a digital mobility stick, which is an exercise stick with a built-in haptic component. It can be used as a measuring and training tool to analyze the body's ability to balance, bend, and rotate and to guide the trajectory of one's exercise movements. We focus on the mobility stick as a training tool, investigating how the haptic technology is introduced to the customer in instructional interaction, and what roles the technology obtains in the process. The paper uses video-recorded customer training interaction data from a health technology company. It draws on multimodal conversation analytic research on instructions and instructed actions, objects, technologies, and touch in interaction. We show that the company representative's specific orientation to the mobility stick was consequential to the instructed actions of the customers and their learning. The analyzed cases also illustrate that the mobility stick gained different roles in the interaction, ranging from a technological and sensorial object to a technology representing information to an active participant in interaction guiding human action. The study thus contributes to our understanding of the multimodality of instructional interaction and the potentially varied roles of technology in such interaction.

KEYWORDS: conversation analysis, customer training, haptic technology, instructed action, multimodality, user testing

Introduction

Health technology devices are increasingly marketed to laypeople. They include smart watches, rings, and other electronic gadgets that measure body functions, and that are designed to help us learn about our bodies. Companies selling such products, and the services around them, may market these new technologies through customer training. This paper focuses on one such case: the introduction of a new haptic technology, a digital mobility stick, and the associated app (see Figure 1 and "The digital mobility stick" section) in customer training interaction in a health technology company.

Using conversation analysis (CA), we aim to investigate how the new technology is made understandable for the customer. We examine instructional sequences (consisting of instructions and instructed actions) where the mobility stick is introduced to the customer, and where the device is handed to the customer to be used as an exercise stick. We aim to provide a systematic and detailed analysis of the mobilization of verbal, embodied, material, and technological resources in the instructions and instructed actions. Our research questions are:

1) How are the digital mobility stick and its haptic function introduced as part of customer training interaction?

2) What roles does the haptic technology gain in the instructions and instructed actions?

When teaching physical skills, both the instructions and the instructed actions can be produced multimodally (Stukenbrock, 2014, p. 81). In our study, where the customer training concerns a bodily practice involving a technological device, the instructions take the form of verbal directives (cf. Goodwin, 2006; Mondada, 2011) and bodily demonstrations, illustrating how the customer should use the technological device, whereas the instructed actions involve the customer using the device according to the instructions.

Figure 1. Mobility stick with measurement application shown on the tablet

While research on instructions involving objects exists (Lindwall & Ekström, 2012), there are fewer studies on instructions involving technologies (however, see Brown & Laurier, 2012). We address this gap by considering how the mobility stick, both as an object and a haptic technology, features in instructional sequences. We also demonstrate that touching the new technology becomes intersubjective through the trajectory in which the customer first touches the mobility stick as a mere object, then as a technological device with haptic functions, and finally as a device that guides their movements. We thus show how the mobility stick's specific uses are consequential for the participation framework (Goffman, 1979) of the training interaction, and that this technological device can play various interactional, even participatory, roles in the unfolding of the activities.

Before presenting our analysis and findings, we provide a review of previous studies on technologies in customer interaction, interaction with objects, and instruction and instructed action.

New technologies in customer interaction

Workplace studies have focused on "technology in action": how tools and technologies become relevant within work activities in air traffic control centers, newsrooms, construction sites, and hospitals (Heath et al., 2000; Heath & Luff, 2000; Luff et al., 2000; McLeod, 2009; vom Lehn, 2018). More specifically, studies on customer interaction in business settings have shown that technologies can become important interactional resources to direct participants' attention during meetings (e.g., Illi et al., 2018). For example, Heinonen et al. (2023) illustrate how the customer's understanding of the software solution demonstrated by the sales representative develops in the interaction, allowing the customer to take a more active role.

Previous research has also addressed customers' engagement with new technologies. Koleva et al.'s (2001) study on the management of players' experiences in a mixed reality performance emphasizes technical support in using new devices and applications. Interestingly, the authors argue that such support could be provided by other players to further strengthen user engagement with the new technology. In all, the study suggests that the adoption of a new technology may be facilitated by human intervention.

Meanwhile, vom Lehn et al. (2007) investigated the use of two innovative systems in a museum exhibition: a gestural interface and a touchscreen panel, both connected to large projection screens. They investigated how people interacted with and around the systems, configured the space around the installation, and examined and discovered their properties. As the system was based on sensor technology, it responded to the user's actions, thus being "active" in the interaction where the human participant, by interacting with it, discovered its functionality, and in effect, saw how their own movement was "the first part of a two-part sequence of user-action, system-response through which the installation [was] operated" (vom Lehn et al., 2007, p. 1487). Thus, the system that recognized human movement turned the human participant into a user (vom Lehn et al., 2007, p. 1487).

Vom Lehn et al.'s (2007) findings raise an important question about material agency. The study illustrates how interaction between technologies and humans can have particular social and material consequences. Suchman (1998, p. 12) suggests that agency resides neither in humans nor in our artifacts but in our intra-ac-

tions, to borrow a term from Barad (see 2007). This understanding of agency shifts attention away from debates concerning its conceptualization (Jackson & Williams, 2021). Instead, agency is approached as locally accomplished in interactions. We thus treat agency as "a situated, dynamic, collaborative, and temporally unfolding enactment within socio-material interactions" (Ibnelkaïd & Avgustis, 2023, p. 2; see also Krummheuer, 2015). For us, agency is both situational and relational.

We therefore aim to show how technology (particularly sensor-based technology) can function as an active participant in interaction, changing the role of the human participant and the general participation framework. With our detailed analyses, we demonstrate the relationship between human actions and the technology's response as well as human responses to the technology, that is, how customers start to interact with the device. Participants may face difficulties in deciding whether and how they should engage with a new device (cf. vom Lehn, 2007, p. 1492) that on the surface looks familiar (e.g., a traditional exercise stick) but has new functions (e.g., a digital exercise stick). We examine the role of instruction in facilitating this learning process.

Interacting with objects: Touch and haptic feedback

Social interaction research has investigated "how participants interact *with* and *through* objects" (Tuncer et al., 2019, p. 385, emphasis in original; see also Nevile et al., 2014). There has been particular interest in objects' interactional ecology (Day & Wagner, 2019), how people organize their embodied conduct in relation to objects, and the role objects play in *in situ* interactional circumstances. This research shows that ownership of an object is consequential for the kinds of obligations that emerge: "Physically claiming an object can give ownership and rights to modify the object and to instigate next action" (Day & Wagner, 2019, p. xvii). Similarly, passing one object to another changes the participation framework, requiring interactional work from the participants (Horlacher, 2019). When investigating objects in interaction, it is therefore important to consider timing of object transfer, the participants' role, their relationship (e.g., close colleagues, company representative, and customer), and object ownership, including who touches it, when, and how.

Object-focused interactions (Weilenmann & Lymer, 2014) show how objects can be central resources in participation. Based on his analysis of manipulation of products in a business negotiation, Streeck (1996) concludes that objects can be treated as things, sensorial objects or symbols. Similarly, Mondada (2016), focusing on products in shops, illustrates the importance of objects not only as discursive but also as sensorial, and more specifically, as inspected by touch.

Touch as a sensorial experience is a key focus of social interaction research; however, unlike studies of interpersonal touch, studies on the touching of objects in interaction remain scarce (Cekaite & Mondada, 2021). Touch is differently manifested in interaction and becomes distributed and collective rather than having merely an individual sensorial dimension (Cekaite & Goodwin, 2021; Cekaite & Mondada, 2021; Mondada, 2016; 2019). A simple example of the collective understanding of touch is when a person touches another person who can feel the touch. However, when a person touches an object during interaction, touching achieves an intersubjective and social dimension when the other participants perceive the touch and

its outcome (for example, an object's sensorial features) for the activity at hand. Cekaite and Mondada (2021, p. 13) argue that

> [f]or material touch, touching an object while being involved in a social encounter can be achieved as a sensorial exploration that is performed and made visible for the other. Touching the object can thereby become a focus of shared attention, intersubjectivity, and joint engagement.

The social dimension of touch is thus necessary for reaching shared understanding. Mondada (2016) shows how touching cheese becomes the basis according to which sellers in cheese shops explain and display the product's quality (i.e., its softness vs. dryness) to the customer. Moreover, Heath and Luff (2020) illustrate how touch and feel feature in the collaborative accomplishment of activities in a surgical operating theatre when people manipulate and handle objects together. They show how the moment of object transfer becomes significant for nurses and surgeons in making sense of the ongoing activity through touch and anticipating how objects should be grasped and handled.

In interaction, participants may topicalize touch through talk, and through talk, make touch relevant in specific moments of interaction (Cekaite & Mondada, 2021, p. 16). Talk and touch can also be systematically distributed depending on the context: although talk can precede and announce touch in medical consultations, talk may accompany touch in medical examinations (Cekaite & Mondada, 2021). Settings new to the participants present especially interesting contexts for interaction research: how do participants establish intersubjectivity of touch when they have different degrees of knowledge about the setting and the object to be touched?

Another question concerns what happens when objects give feedback to the user through touch. Haptic technologies such as smart watches that notify when the user should start moving have been studied within human-computer interaction (HCI) (Ionut & André, 2016; Spelmezan et al., 2009; Sreelakshmi & Subash, 2017), and business research and marketing (Hadi & Valenzuela, 2020). HCI studies have investigated outcomes of the haptic feedback and their accompanying messages for user behavior (see for example Ionut & André, 2016); business and marketing research has suggested that haptic feedback can be seen to symbolize human touch (Hadi & Valenzuela, 2020, p. 258). The literature on consumer-product interactions implies that technology-mediated touch increases the sense of social presence: devices with haptic feedback are perceived to act with agency and intention (Biocca et al., 2003 as cited by Hadi & Valenzuela, 2020, p. 258). Interestingly, however, social interaction research has paid little attention to devices with haptic feedback functions, which is why we know very little about how such objects are treated, or how they participate in interactions. Most studies on objects-in-interaction have also focused on objects familiar to the participants (Day & Wagner, 2019), whereas no previous studies exist on customer interactions, which are simultaneously manifested as instructional interactions in which customers physically handle a new object with new technological functions for the first time.

Instruction and instructed action

Instructional sequences have been widely studied in ethnomethodological and conversation analytic research (see Mondada, 2014 for an overview). Instructions are sequentially organized into the "instruction" – "instructed action" adjacency pair (Stukenbrock, 2014). The first

pair part constitutes "instruction" (Garfinkel, 2002) or "directive" (Goodwin, 2006; Mondada, 2011). A second pair part follows, conditioned by the first. This "instructed action", also called "instructed/following" (Garfinkel, 2002) or "complying action" (Mondada, 2011), responds to "instruction".

Instructions involving objects have been of specific interest in social interaction research (Lindwall & Ekström, 2012). Studies have also addressed technology in instructional sequences, for example, in GPS navigation in cars, showing how technology directs instructed action (Brown & Laurier, 2012). Much of the previous research has also considered the use of visual bodily resources in instruction and instructed actions (Keevallik, 2010; 2014a; 2014b; Mondada, 2014; Stukenbrock, 2014), further attesting to the multimodality of instructional sequences. In our data, multimodality is manifested notably in the use of the body and the mobility stick. In the sequences on which we focus, the company representative instructs the customer on "how to do things with things" (Streeck, 1996), i.e., how to use the technological object with one's body. As Stukenbrock (2014, p. 80) notes, in instructions that deal with bodily practices, "some kind of activity which requires special motor skills, professional techniques, the handling of tools and objects, etc., bodily practices … constitute the object of communication, demonstration, and assessment." This suggests that for teaching and learning to take place, the instructor may need to provide bodily demonstrations to be imitated by the learner. In addition, touching the mobility stick as a technological device and the intersubjectivity of touch become important for learning.

In terms of verbal and embodied actions, instructional sequences differ: when instructions are manifested verbally, the instructed action is achieved multimodally (De Stefani & Gazin, 2014; Mondada 2014); however, when the object of instruction is a bodily practice, the instruction is often multimodal, as well as in the form of a bodily demonstration (Råman, 2022; Stukenbrock, 2014). Each instructional move can differ in their design, whether verbal, in various forms of deictics, embodied demonstration, or physical manipulation (Lindwall & Ekström, 2012).

As Mondada argues (2014, p. 158), instructional sequences need to be studied from two perspectives: the multimodal resources mobilized and how features of the surrounding material and spatial environment are made relevant by the specific action and its trajectory. To analyze instructional sequences in this paper, the moments of object transfer therefore become significant, as it is in these moments that the customer obtains the right to handle the technological device. By touching the haptic technology, the customer becomes involved in the specific form of embodied knowledge concerning it (cf. Mondada, 2016). We show how the intersubjectivity of touch is essential for this learning to happen, and that touching the stick as an object, then as a technology, and finally experiencing the haptic technology, are key elements in the instructional sequences.

The digital mobility stick

The new technological device on which this paper focuses, the digital mobility stick, is an exercise stick with a built-in haptic component. It can be used for body mobility measurement (e.g., by physiotherapists when evaluating their patients' body mobility) and exercise (e.g., by athletes seeking to improve their body's ability to balance). In the paper, we focus on the device as it is used for exercise movements. As a

training tool, the device resembles a spirit level in its functions, but with integrated technology and a digital display in the middle of the stick (see Figure 1). The stick has two modes: in the first, the stick vibrates when it is not level. For example, if a person lifting the stick horizontally above their head has their hands in an uneven position, they will feel the lower end of the stick starting to vibrate, indicating that they should correct their movement. In the second, the stick starts to vibrate when it is placed at a 45-degree angle, which helps the user do side bends in symmetry. In the customer training interactions, the participants tested the first mode only.

Data and methods

Data

The data for this study were collected during the COVID-19 pandemic in the spring of 2021 for the authors' research project on complex language and communication work in technologized global business (GloBus[1]). For four months, we followed how a health technology company developed a new wellbeing concept for office workers (= customers) around the digital mobility stick. The development of the concept included customer training sessions where the company tested the effects of mobility exercises conducted by customers with the mobility stick on the customers' trapezius muscle tension. For the company, this testing and the associated training of the customers in using the mobility stick for exercise was a means to market their product and to gather data for further marketing purposes. For the customers, participation in the testing and training was a free way to learn about their body mobility and try a new product.

The data collection was ethnographic: it included recording and observing the company's planning meetings and customer testing and training sessions, collecting document data and interviewing the company representatives during the product development. Part of the data collection was conducted on site and part remotely, following the practices adopted in the company. Figure 2 illustrates the company's product development stages.

We focus on customer testing and training sessions conducted at a university lab with a remote connection to a company representative and researchers from another university. Another company representative was on site, one customer at a time (8 customers the first day, and 9 customers the second/third day, two of which were new, i.e., altogether 10 different customers), the lab representative responsible for the biosensor measurements, and the researchers from the host university. The data from these sessions consist of ca. 14 hours of video-recordings of the customer interaction (in Finnish and English) and observations and fieldnotes divided into 45–60 min sessions with each customer on both days.

The key participants in the interactions are the company representative and the customer present on site. In the data extracts, the onsite company representative is referred to as INS1, reflecting their role as the main instructor, and the customers, who are the instructed participants in the interaction, with a P followed by an identifying number. The remote company representative is referred to as INS2. The labels are intended to ease the reading, rather than cement the participants' roles *a priori*.

[1] See https://globusresearchproject.wordpress.com/.

The stages in the company's product development

- joint remote planning by company representatives
- recruitment of participants
- customer testing and training day (on-site with a remote component), including
    - customers' muscle tension measurement with biosensors
    - customers' body mobility measurement with the company's digital mobility stick
    - training of customers on basic smart functions of the stick
    - customers doing exercise movements with the help of the stick
    - second muscle tension measurement with biosensors
- weekly training videos for the customers (7 weeks)
- second measurements and tracking of changes in the customers' muscle tension and body mobility (two days on-site with a remote component)
- customer feedback
- marketing of the new concept

Figure 2. The company's product development stages

Method

Our analysis of the customer interaction is anchored in multimodal CA, focusing on instructions and instructed action (Mondada, 2014; Stukenbrock, 2014) and objects-in-interaction (Day & Wagner, 2019), including the touching of objects (Cekaite & Mondada, 2021). We also draw on our ethnographic understanding of the interactions as part of the company's product development (cf. Räisänen, 2020). Our interest is in the instructions the company representative provides and the customer's instructed actions involving the handling and use of the mobility stick as a new technological device.

We zoom in on those parts of the first training day interaction where the company representative introduces the mobility stick's haptic function and hands the device to the customer to use as an exercise stick. In these moments of transition, the customer gains physical control of the mobility stick as an object (cf. Day & Wagner, 2019, p. xvii) and learns through the company representative's explanation and touching the stick about the haptic function integrated in the stick. We study how the participants treat the device in the instructional sequences and consider the semiotic resources drawn on to make sense of the technology. We do this by focusing on three cases where the instruction takes different forms, influencing the instructed action.

Although the company representative had an agenda for the interactions, the sequence of actions varied across the meetings. The company representative usually mentioned the main steps in the beginning (i.e., first biosensor measurement, mobility measurement, exercises, second biosensor measurement), but the

introduction of the mobility stick's haptic function was not in the overall plan. In all cases, the situation was new to the customer, for whom the content, procedure, and progression of activities in the meeting, as well as the device were unfamiliar.

Research ethics

Participation in the research project was voluntary and based on informed consent. The participants were also informed about data protection following the EU's General Data Protection Regulation (GDPR). The company and data extracts have been anonymized to protect the participants' identity. Relevant parts of the interaction data were transcribed for analysis, adapting Mondada's (2016; 2019) suggestions for multimodal CA (see "Transcription conventions"). In the data extracts, which we have translated from Finnish into English, we also use still images from the video recordings to illustrate relevant actions.

In presenting our findings, we first provide an overview of the customer training situations. We then present three cases of instructional sequences to illustrate how the company representative(s) instructed customers in the use of the technology, and how customers responded to this.

Findings: Instructing new technology use in customer interaction

At the beginning of the testing and training sessions, INS1 and/or the researcher in the lab tended to introduce the mobility stick by casually referring to it as *a stick* "keppi" or *tool* "työkalu" and briefly pointing to the device in the room, suggesting the customers were expected to know the mobility stick would play a key role in the activities. Indeed, before the session, the customers had received a video on mobility analysis conducted with the mobility stick, so they had some sense of the device's appearance and its use in mobility analysis. However, the video did not introduce the haptic function of the stick, which is key when doing exercises with it. Our focus is therefore on those parts of the interaction where the haptic function (particularly the first mode, see "The digital mobility stick" section) was first introduced, and the customer was given the right to use the stick.

All such instructional sequences occurred at a moment of transition: either from the biosensor measurement to the mobility analysis or from the mobility analysis to the exercises. Most instances occurred after the mobility analysis, which was also when the instructor handed the stick to the customer for use in the exercises. In the instructional sequences, the role of the mobility stick changed from a mere object to a device with integrated haptic technology, and the customers learned the meaning of the haptic function of the stick. We next present an analysis of three cases of such multimodal instructional sequences, demonstrating that the company representative's orientation to the stick influenced the customers' instructed actions and learning. The cases show that the customers learned the meaning of the haptic function (1) by trial, error, and explanation during the exercises, (2) by hearing about it before the exercises and potentially testing the function on their own, or (3) by testing the function with INS1.

Case 1: Trial, error, explanation

We identified one instance where the customer learned the meaning of the haptic function during the first exercise. This occurred in the first customer's (P1) training session and is exemplified in Extract 1. Before Extract 1, INS1 has just finished the mobility analysis and asked P1 to return to the biosensor measurement position. As the original plan was to move to the exercises next, INS2 interrupts from Zoom, prompting INS1 to apologize for the customer. Extract 1 starts after this side-sequence, with INS1 handing the stick to P1 (l. 1, fig. 3).

In the extract, INS1 first gives the stick to P1 who grabs it and starts to hold it still with both hands in front of their body, gazing at it (l. 1). INS1 then goes to connect the stick to the tablet, and after a while (in l. 4), provides a short verbal reference to the haptic function: *let's turn on the vibration* "laitetaan sinne vähän värinää päälle". During this preparation, P1 continues to hold the stick still in both hands. INS1 then grabs one end of the stick and briefly holds the stick with P1 asking, in line 5, *did it start to vibrate* "rupesko värähtää", to which P1 comments verbally *mmm yeah* "mm joo" (l. 6) but does not change the position of the stick. So, while INS1 mentions the haptic technology (*vibration on*) and orients to the haptic sensation (i.e., that the customer can sense a vibration when the technology is on), they do not explain its meaning, which leaves the customer uncertain about the purpose of the vibration.

The instruction then begins: INS1 releases their hand from the stick, grabs their notes, and starts to verbally explain and bodily demonstrate (as if holding a mobility stick) the first move in lines 9–15: they instruct the customer in what they are supposed to do next, how to position their body, and where to put the stick. The instructed action is an embodied response by P1, who complies with the requested physical action using the mobility stick: that is, holding the stick in both hands, they start raising their hands. When doing this, P1's right hand remains lower than the left, and it starts to shake because the stick vibrates (l. 15–16, fig. 6). This causes INS1 to walk to P1 and repair the customer's movement by adjusting the stick (fig. 7) and commenting that the stick's tilting causes it to vibrate (l. 18), partly overlapping with P1, who briefly acknowledges the comment. In this process, the stick as a haptic device gains a participatory role: that is, with the human participants reacting to the stick's vibration, the haptic device guides the participants' interaction and their embodied actions.

However, at this point P1 still does not know what the purpose of the haptic feedback is. This is confirmed by the following turns: INS1 explains in line 21 that the aim is that the stick does not vibrate "eli tavote on että se ei värise", to which P1 orients as new information, producing a partly overlapped turn *it's not supposed to vibrate ah okay* "se ei sais väristä aa okei" in line 23. Only at this point has the customer learned the purpose of the haptic feedback, that is, having experienced it first with their body through touch and then having heard what the haptic sensation indicates in relation to their movement. The combination seems key for the learning, that is, the embodied experience is given meaning through the verbal explanation of what the stick is not supposed to do. In instructing the customer on how to interact with the stick, INS1 thus acts as a mediator between P1 and the technology, in effect facilitating P1's engagement with the haptic device (cf. Koleva et al., 2001).

That there is less orientation to what is new to the customer and thus little instruction on the

Extract 1. P1 learns by doing

1 INS1 otas tosta keppi
take this stick here
+GAZING AT P1, INS1 HANDS STICK TO P1 (FIG. 3), SHIFTS GAZE AND WALKS TO TABLET
P1 GRABS STICK IN BOTH HANDS, GAZES AT STICK

Figure 3. INS1 hands stick to P1.

2 P1 okei
okay
*P1 HOLDS STICK HORIZONTALLY IN FRONT OF THEIR BODY
3 INS1 ja sit mä tota (2.0) laitan täältä
and then I will erm (2.0) put on here
+INS1 TOUCHES TABLET SCREEN-->
P1 GAZE SHIFTS FROM STICK TO INS1
(16.0)
*P1 GAZE SHIFTS FROM INS1 TO ROOM TO STICK, HOLDS STICK STILL IN FRONT OF THEIR BODY (FIG. 4)

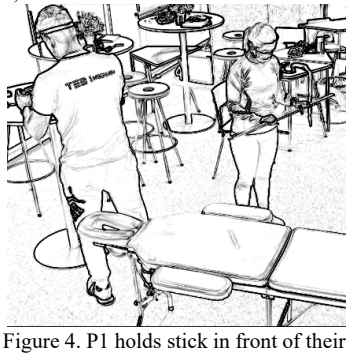

Figure 4. P1 holds stick in front of their body.

4 INS1 laitetaan sinne vähän (2.0) värinää päälle
let's turn on (2.0) the vibration
*P1 SHIFTS GAZE TO TABLET, THEN ROOM
(3.0) (1.0)
->+
+INS1 TAKES A STEP TOWARDS STICK, GRABS END OF STICK
*P1 SHIFTS GAZE TO STICK
5 INS1 rupesko värähtää
did it start to vibrate
+GAZING AT STICK, HOLDS END OF STICK (FIG. 5)

Figure 5. INS1 holds the end of the stick; both gaze at stick.

6 P1 mm joo
mmm yeah
*P1 GAZES AT STICK
+INS1 MOVES BACK TO TABLET, GRABS NOTES FROM TABLE

7 INS1 hyvä tehään viis liikettä kymmenen toistoo per liike
good let's do five exercises at ten repetitions per move
+INS1 WALKS TO MEASURING TABLE AND PUTS NOTES ON IT, ADJUSTS FACE MASK
*P1 GAZES AT INS1

8 INS1 INS2 voi sieltä tutkailla ja ja (kommentoida)
INS2 can observe there and and (comment)
+INS1 GAZES AT ZOOM SCREEN, THEN WALKS IN FRONT OF P1, ADJUSTING FACE SHIELD

9 INS1 eli ota rintamasuunta (.) minuun päin
so face (.) me
+P1 GESTURES WITH HANDS TO INDICATE BODY POSITION
*P1 TAKES A STEP SIDEWAYS TO FACE INS1

10 INS1 sit tota laita keppi tänne alas ja ota
then er put the stick down here and take
+INS1 PUTS HANDS DOWN BESIDE THEIR BODY AS IF HOLDING STICK
*P1 MOVES STICK LOWER

11 INS1 (.) pikkusen leveempi vielä ote
(.) still a grip that's a little wider
+INS1 GAZES AT P1
*P1 MOVES HANDS WIDER APART, HOLDS STICK HANDS STRAIGHT

12 INS1 ota vaan vähän vielä leveempi siitä
take a grip of it even wider
*P1 MOVES HANDS EVEN WIDER APART, HOLDS STICK HANDS STRAIGHT

13 P1 mm
mmm

14 INS1 (.) ja sit lähet tekee (.) nostoo ylös
(.) and then start doing (.) lift-ups
+INS1 TURNS TO FACE MEASURING TABLE, LIFTS BOTH HANDS UP
*P1 STARTS TO LIFT STICK

15 INS1 niin pitkälle ku menee
as far as it goes
*P1 CONTINUES LIFTING STICK, RIGHT HAND LOWER (FIG. 6)
'STICK VIBRATES

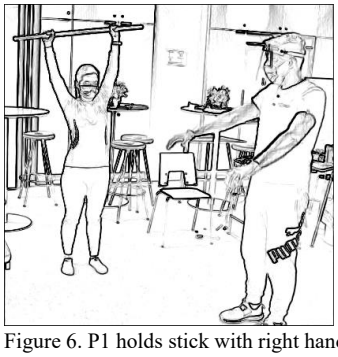

Figure 6. P1 holds stick with right hand lower.

16 P1 ihan siis (.)
so (.)
*P1 TILTS STICK SIDEWAYS
17 INS1 (alas)
(down)
+INS1 LOWERS HANDS
18 INS1 ja nyt huomaat ku se keppi värähtää
and now you notice that when the stick vibrates
+INS1 WALKS TO P1
19 INS1 [niin] sillon tämä käsi tulee perässä
[then] this hand is left behind
+INS1 ADJUSTS STICK BY GUIDING P1'S WRISTS (FIG. 7)

Figure 7. INS1 adjusts the stick.

20 P1 [niin]
[yeah]
21 INS1 eli tavote on että se ei värise
so the aim is that it won't vibrate
+INS1 HOLDS P2'S WRISTS TO KEEP STICK STRAIGHT
22 INS1 [ni sillon se keppi on suorassa]
[then the stick is straight]
+INS1 PUTS RIGHT HAND IN HORIZONTAL POSITION, THEN WALKS BACKWARDS AWAY FROM P1
23 P1 [se ei sais väristä] aa okei
[it's not supposed to vibrate] ah okay

haptic function of the device at the beginning of the exercises distinguishes this case from the other instructional sequences. In this case, the customer was given the right to use the stick before they knew the new technology's purpose, and the customer therefore learned the meaning of the haptic function only after they had started doing the exercises. The instructional sequence thus differs from the other cases in that the instruction concerning what the haptic function means continues to the exercise part of the interaction. This may be explained by the fact that P1 was the first customer, and no routine for the sessions had been established yet.[2]

Case 2: Verbal explanation and bodily demonstration

Instructions where INS1 provided a verbal explanation and a bodily demonstration of the meaning of the haptic function before they handed the stick to the customer to use occurred three times in the data. The interaction with P2 is a case in point.

P2 took a particularly active role in the interaction – verbally and through embodiment and use of the technology – which is evident throughout the interaction. During the transition to the exercises, and even before INS1 had explained the haptic function, P2 commented: *so we'll then do exercises with this and see if the situation improves* "elikkä tällä nyt jumpataan ja katotaan että paraneeko tilanne", thereby indicating their developing understanding of the stick's purpose and the entire training. The word choice "jumpataan", that is, the passive verb form of the noun "jumppa" *exercise*, also found in the compound noun "jumppakeppi", denoting a traditional exercise stick, suggests that the confirmation check was still related to the stick's traditional use. However, during the calibration of the stick, the customer begins to actively orient to the haptic function (Extract 2).

The extract starts at a point when INS1 has placed the stick on the floor and turned it on. In the extract, INS1's instruction concerning the meaning of the haptic feedback includes a verbal explanation accompanied by a bodily demonstration: explaining the function in relation to the first exercise move, as if holding a mobility stick, they raise both hands in an unbalanced position and shake their lower hand (l. 10–12). The instructions about the first move and the stick function are thus provided together. P2's instructed action includes mimicking INS1's movement by raising and tilting their hands as if holding a mobility stick and saying *lift* "nosta" in line 13, preempting INS1's utterance. P2's bodily reaction and utterance in line 13, which is latched to the previous turn, and INS1's acceptance in line 14 of the term *lift* illustrates intersubjectivity. It indicates that the customer is actively participating in constructing an understanding of the haptic technology, and how it relates to the exercise. We can also see that the technology is allocated a degree of agency when INS1 says in line 8 that the stick *warns you* "varottaa sua" if you lose your balance, and that the vibration is *a signal* "signaali" to change the movement (l. 12). INS1 thus verbally acknowledges the stick's participatory role in the interaction: the stick is intended to guide human action.

In line 17, INS1 grabs the stick from the floor, reproducing the instruction: they now briefly repeat the explanation and bodily demonstration using the actual stick and then hand the stick to P2 with an invitation to try it: *come and try here* "tuuppas kokeilee siihen" (l. 19, fig. 9). This directive sets the context for P2's instructed action: P2 responds by lifting the stick in front

[2] As pointed out at the outset, this lack of routine was also evident in that INS1 first started to shift toward the second biosensor measurement immediately after mobility analysis, but INS2 intervened on Zoom, guiding the onsite instructor to move to the exercises.

Extract 2. P2 mimics bodily demonstration

1 INS1 ja nyt anna sen rauhassa käynnistyä tossa lattialla
and now let it turn itself on on the floor
+INS1 POINTS TO STICK WITH BOTH HANDS
*P2 GAZES AT STICK
2 jos sä liikutat se kalibrointi menee virheelliseksi
if you move it the calibration will go wrong
+INS1 SHIFTS GAZE TO P2
3 ja sit se sammuttaa ittensä
and then it will turn itself off
+INS1 SHIFTS GAZE TO STICK
*P2 NODS
4 P2 joo
yeah
5 INS1 se on kaks kakskytä sekuntia tota käynnistyy
it takes twe- twenty seconds for it to turn itself on
6 ja siinon kaks toimintoo
and it has two modes
+INS1 HOLDS LEFT-HAND FINGER WITH RIGHT HAND, GAZE SHIFTS TO P2
7 se toiminto mikä tulee käynnistyessä
the mode that comes first when you turn on the device
+INS1 HOLDS HANDS IN FRONT OF BODY WITH PALMS FACING UP
8 se varottaa sua jos sä menetät balanssin
it warns you if you lose balance
+INS1 LIFTS BOTH HANDS HIGHER, PALMS FACING DOWN, PUTS HANDS IN AN UNBALANCED POSITION AS IF HOLDING THE STICK, AND SWINGS HANDS THREE TIMES+
P2 SHIFTS GAZE FROM STICK TO INS1
9 P2 joo-o
yeah
P2 SHIFTS GAZE FROM INS1 TO STICK
10 INS1 eli heti jos se keppi kallistuu
so immediately when the stick tilts
+HANDS LIFTED IN AN UNEVEN POSITION, GAZING AT P2, INS1 SHAKES LOWER HAND-->
11 ni se ala kumpi on alempana ni se tärisee
the side which is lower it shakes
->
SHIFTS GAZE FROM STICK TO INS1
12 että se on sulle signaali että=
so that's a signal for you to=
->+
13 P2 =nosta
lift
P2 LIFTS BOTH HANDS TO HORIZONTAL POSITION (FIG. 8)

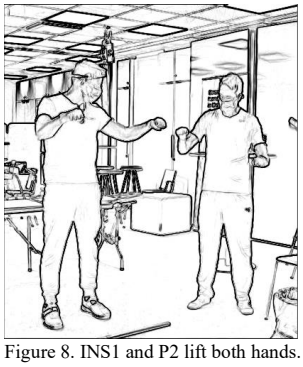

Figure 8. INS1 and P2 lift both hands.

14 INS1 nosta ja heti sillonko se ei tärise
lift and immediately when it does not shake
+INS1 HOLDS BOTH HANDS IN HORIZONTAL POSITION, THEN SLAPS HANDS TO THIGHS, GAZE SHIFTS FROM P2 TO STICK
15 ni sillon liike pysyy kontrollissa ja suorassa

then the movement is in control and straight
+INS1 MOVES HANDS SIDEWAYS
*P2 NODS, GAZES AT STICK
16 P2 okei
okay
17 INS1 eli heti jos vaikka (.) lähtee kallistuu (.)
so immediately if (.) it starts to tilt (.)
+INS1 GRABS STICK IN BOTH HANDS, LIFTS IT IN UNEVEN POSITION, BALANCES IT, GAZES AT P2-->
18 pietään suorassa
keep it straight
->+
19 tuuppas kokeilee siihen
come and try here
+INS1 HANDS STICK TO P2 (FIG. 9)

Figure 9. INS1 hands stick to P2.

20 (3.0)
*P2 TAKES STICK IN BOTH HANDS, LIFTS THE STICK (FIG. 10), TILTS IT LEFT, BODY FACING SCREEN

Figure 10. P2 lifts and tilts the stick.

21 P2 joo
yeah
22 INS1 eli vähä aikaa siinä menee että
so it will take a while before you will
*P2 CONTINUES TILTING THE STICK SLOWLY FROM SIDE TO SIDE-->
+INS1 LIFTS HANDS UP TO IMITATE THE MOVEMENT
23 sä bonjaat sen että kummalta puolelta se
get which side the
->
24 värinä tulee mutta aika nopeesti sä sen sitte (.) siinä opit
vibration comes from but you will learn (.) it pretty quickly
->*
+LOWERS HANDS, WALKS TO LAPTOP

of their face, swinging it left and right (fig. 10), and then providing a verbal acknowledgment: *yeah* "joo" in line 21. This is a signal that P2 not only responds to INS1 but also orients to the haptic function of the stick; their verbal confirmation *yeah* shows that, as invited by INS1, they have tried the vibration, and the attempt has ended. The instructor then comments that it will take time to learn to notice which side of the stick is vibrating (l. 22–24).

In this extract, the company representative clearly orients to what is new to the customer multimodally in their instructions through verbal explanations and bodily demonstrations twice – with an imagined and real mobility stick – and the customer mimics their activity. P2 becomes an active technology user even before the exercises have started, and they have received the right to use the device. They learn about the new technology by commenting on and asking questions about the device and the training, mimicking the instructor's embodied conduct, and trying the device. Interestingly, situated learning about the technology becomes an intersubjective experience with an imagined and real mobility stick. P2 also starts doing the first exercise immediately after a training video starts showing on the screen, which further illustrates their active participation in the interaction and training. This activeness of P2 progresses the action and seems to prompt INS1 to ascribe P2 an active role as a technology user: INS1 offers further instructions about the stick's calculator function, triggering P2 to ask whether the results obtained with the stick are transferred to a mobile phone. This occurred with no other customer. That P2 took such an active role was untypical in the data; it usually took longer for the participants to establish a joint understanding of the purpose of the haptic function. In addition, although P2 was asked to try the haptic function before the exercises, in other similar cases, the customers were directed straight to the actual exercises.

Case 3: Explanation followed by joint bodily orientation to haptic feedback

Instructional sequences that included joint bodily orientation to the haptic feedback occurred with six customers and were thus the most common in the data. The instructional sequences resembled the previous case but with one crucial difference: in the first pair part, the instructor first verbalized the vibration function of the stick and then handed the stick to the customer, but unlike in the previous case, the instruction continued when the instructed action began, as the instructor continued to hold the stick with the customer. The instructor and customer then jointly oriented to the haptic feedback verbally and with their bodies. Based on the video data, the instructor guided the movement with the stick, but the customer was part of the action and haptically oriented to the stick's vibration. The instructor then released their hands from the stick so that the customer held it alone and could begin the first exercise move.

Extract 3 is a typical case. It starts when the stick is lying on the floor, and INS1 has explained the calibration and is now starting to explain the stick's haptic function. Unlike in most cases, the instruction occurred after the biosensor measurement, but the orientation to the haptic function followed a similar pattern to the other similar cases.

Extract 3. Joint embodied orientation to stick with P3

1	INS1	siin on kaks toimintoo (1.0)
		it has two modes (1.0)
		+GAZE AT P3, INS1 LIFTS HANDS AND TOUCHES LEFT-HAND FINGER WITH RIGHT HAND+
		*P3 GAZES AT INS1, NODS
2		värinätoimintoo toinen varottaa jos sä kallistat
		vibration modes the other one warns you if you tilt
		+INS1 LIFTS HANDS TO SHOULDER LEVEL AS IF HOLDING STICK, BENDS SIDEWAYS-->
3		sitä keppiä eli kaikki liikkeet pitäs mennä suoraan symmetrisesti
		the stick so all movements should be symmetrically straight
		->+
		+INS1 LOWERS HANDS, LIFTS THEM ABOVE HEAD AND DOWN TO SHOULDER LEVEL+
4	P3	okei!
		okay!
		*NODS
5	INS1	eteentaivutukset kaikki
		bending forward and everything
		+INS1 BENDS BODY FORWARDS, HANDS ABOVE HEAD
6		no sä voimistelijana tiiät koreografioista
		well you as a gymnast you know about choreographies
		+INS1 LIFTS HANDS UP AND DOWN TWICE
7		[symmetriaa ni tota]
		[symmetry so that]
8	P3	[joo joo heh kyllä kyllä] kyllä kyllä
		[yeah yeah heh] yes yes yes yes
9	INS1	tässä haetaan vähä samaa
		we're basically trying to achieve the same thing
		+INS1 GAZE SHIFTS TO STICK AND BACK TO P3
10		että jos se käsi nousee hitaammin ko toinen
		so if your hand rises slower than the other
		+INS1 LIFTS BOTH HANDS, LEFT HAND LOWER
11		niin sit se varottaa ja oppii kontrolloimaan
		then it warns you and you learn to control
		+MOVES HANDS ABOVE HEAD-->
12		sitä symmetrisesti sitä liikettä
		the movement symmetrically
		->+
		+INS1 LOWERS HANDS, SHIFTS GAZE TO STICK
13	P3	joo joo
		yeah yeah
14	INS1	eli eli jos kokeilet ni siel on nytte tota
		so if you try it this way now there er
		+INS1 GRABS STICK FROM THE FLOOR, GAZES AT P3, HANDS IT TO P3, STILL KEEPING HOLD OF THE STICK
		*GRABS HOLD OF THE STICK WITH BOTH HANDS, GAZE AT STICK
15		tää ykkösmoodi antaa heti
		the first mode immediately gives you
		+INS1 TILTS STICK SIDEWAYS WITH P3 (FIG. 11)

Figure 11. INS1 and P3 tilt stick sideways.

16 palautteen ni [se puoli] mikä on alempana
feedback so [the side] which is lower
+INS1 LETS GO OF STICK, POINTS TO ONE SIDE OF STICK, GAZES AT P3
*P3 HOLDS STICK BALANCED IN BOTH HANDS

17 P3 [okei!]
[okay!]

18 INS1 ni sitte se värähtää ja sä opit aika nopeesti
it vibrates and you will learn pretty quickly
+INS1 TAKES A STEP BACK, BALANCES HANDS AT SHOULDER LEVEL, GAZES AT P3
*P3 TILTS STICK SIDEWAYS ONCE, GAZES AT STICK

19 sen sit tunnistaa et kummalta puolelta se tulee
to recognize from which side it comes
+INS1 CONTINUES BALANCING HANDS, LOWERS LEFT HAND, GAZES AT P3
*P3 RETURNS STICK TO BALANCE AND HOLDS IT STILL, GAZES AT STICK

20 alussa saattaa olla että no mistä se [tulee mut vähä]
at first it may be that well where [it comes from but]
+INS1 RAISES HANDS TO HEAD LEVEL AND BALANCES THEM-->
*P3 GAZE SHIFTS FROM STICK TO INS1

21 P3 [niin niin] niin niin=
[yeah yeah] yeah yeah
*P3 SHAKES STICK SIDEWAYS-->

22 INS1 =nostaa keskittymiskykyä myöski ku [siin] joutuu keskittyy
it also improves concentration when [you] have to concentrate
->+
+INS1 LOWERS HANDS
->*

23 P3 [joo]
[yeah]

24 joo vaude hehheh
yeah wow hehheh
*HOLDS STICK BALANCED
+INS1 TAKES STICK FROM P3

In the extract, INS1 explains how the first mode of the stick *warns* "varottaa" you by vibrating if you tilt it (l. 1–3); a bodily demonstration accompanies this verbal explanation with an imagined mobility stick. Both the active verb associated with the stick and the demonstration suggest that the stick is oriented to not only as a technological device used by the human participants but also as an actor guiding human action. P3 responds to the instruction with a verbal confirmation *okay* "okei" with a rising intonation (l. 4), suggesting that the information INS1 provides is new to the customer. The explanation and the instruction continue in lines 5–13, after which INS1 grabs the stick from the floor (l. 14) and hands it to P3, who takes it in both hands, but importantly, INS1 does not release their grip on it. While doing this, INS1 continues to give instructions, asking P3 to try the stick's first mode, explaining that *the first mode immediately gives you feedback so the side which is lower it vibrates* "tää ykkösmoodi antaa heti palautteen ni se puoli mikä on alempana ni sitte se värähtää" (l. 15–18). In the middle of the instructor's explanation, the two participants tilt the stick sideways once (fig. 11, l. 15), thus orienting to the haptic feedback of the stick together. This joint action is interesting from the perspective of the instructional sequence, as it seems to combine instruction with the instructed action: The holding and moving of the stick by INS1 and P3 together blur the boundaries of turn taking in multimodal interaction (cf. Stukenbrock, 2014): the instruction and the instructed action occur simultaneously.

P3 confirms that they sense the haptic feedback with *okay* "okei" in line 17, again with rising intonation, in overlap with INS1's earlier turn. INS1 has now released their hands from the stick and takes a step back. They then explain encouragingly that *you will learn pretty quickly to recognize from which side it* [i.e., the vibration] *comes* "sä opit aika nopeesti sen sit tunnistaa et kummalta puolelta se [=värinä] tulee" (l. 18–19), acknowledging that it may initially be difficult to understand where the haptic feedback comes from. As the instructor explains this, P3, now holding the stick alone in their hands, produces instructed action and tilts the stick sideways once (l. 18), thus orienting to the haptic technology on their own. P3 then confirms with *yeah* "niin" four times (l. 21), further demonstrating their involvement and orientation to learning about the technology. At the end of the sequence, the customer provides an evaluation of the technology with *yeah wow* "joo vaude" and laughter (l. 24). This shows how much the new technology impresses them.

Extract 3 illustrates an instructional sequence where the instructor introduces the purpose of the mobility stick's haptic function in clear steps. First, the instruction is provided verbally and through bodily demonstration, using an imagined stick; then through touch and verbal explanation during joint embodiment and technology use, with the customer and instructor using the stick together. Finally, the customer is given the right to try and in the exercise part, use the stick on their own, allowing the customer to gradually adjust to the new device.

Discussion and conclusion

In this paper, we have investigated customer training interaction in a health technology company by considering how a new technological device, the mobility stick, is introduced to the customer and what roles the technology gains in instructional interaction. Regarding the first research question (How are the digital mobility stick and its haptic function introduced as part of customer training interaction?), the analysis shows that the company representative's in-

structions were consequential to the customer's instructed actions and learning process. In Case 1, the instructor drew the customer's attention to the stick's vibration before the exercises, but the customer eventually learned the meaning of the haptic function only when they had started doing the exercises. In Case 2, the instructor used verbal explanations and bodily demonstrations twice before inviting the customer to test the device. The customer oriented to the newness of the technology with verbal responses, questions, and comments and by mimicking its use with their embodied actions. In Case 3, illustrating the most common type of instructional sequence in the data, the instructor combined verbal and embodied explanations, and before handing the stick to the customer to use on their own, held the stick with them. The instructor and customer could thus jointly sense the stick's haptic feedback and recognize its purpose in relation to their bodily movement.

The stepwise introduction in Case 3 seemed the most effective way to introduce the technology. The participants' joint embodied orientation to the haptic feedback, which demonstrates their intersubjective experience of the haptic function, was particularly useful in clarifying the connection between the haptic feedback and bodily movement – including in cases where the customer might have been less inclined to claim the right to use the stick. Such an instruction ensures the customer not only learns the meaning of the haptic function but also that they have a bodily experience of the vibration before doing the exercises (cf. Extract 1). Jointly touching the stick further enables the instructor to confirm the customer's learning. Such an instruction also appeared less time-consuming than Case 2, where the verbal and embodied explanation of the function was followed by the customer trying the function on their own before doing the exercises.

The instructions aimed to teach the customer to understand the meaning of the haptic feedback so that they could interact with the stick on their own. The cases suggest that the crucial moment for learning was when the customer realized the connection between the haptic feedback and the exercise movements. The findings thus comply with Mondada (2016) by showing how "sensoriality is a crucial dimension of embodied action" (p. 360) and specifically, instructional sequences. While intersubjectivity can be attained through orientation to the technology with embodied actions and touch, merely seeing the mobility stick as an object and touching it as a static object are insufficient to learning the meaning of the haptic feedback and its connection with the exercises. Participants need to reach intersubjectivity in the entire spectrum of sensorial practices that are part of the activity (Mondada et al., 2021) and most importantly, sense the technology with touch themselves. Our findings thus extend earlier social interaction research on touching new objects by revealing how human action, through instruction and instructed action, and non-human action, through haptic feedback, work together in establishing intersubjectivity.

The instructions-instructed action format of the training was similarly important, as this allowed the company representative to dynamically manage the customers' experience and facilitate their adoption of the new technology. As the mobility stick cannot detect and repair misunderstandings (Suchman, 1998), should they arise in interaction between the technology and the human, the company representative's presence was key in achieving mutual intelligibility. Our findings are thus aligned with those in Koleva et al. (2001), that is, human support in learning to use new technology may strengthen the learner's engagement with technology and enhance user experience. The findings there-

fore also have implications for user testing. In addition to testing how a user manages to operate a new technology on their own (Pinch, 1993), user tests could examine the extent to which and how human facilitation would augment the implementation of the technology and strengthen user commitment to it. While testing the user's ability to operate a new technology can help improve the usability of the technology (Pinch, 1993), such testing enables other factors to be considered that influence the user's willingness to adopt the technology in their everyday use. From a marketing perspective, such tests could further shed light on the cost-effectiveness of human facilitation that can be seen as part of increasing a sense of social presence (cf. Biocca et al., 2003, as cited by Hadi & Valenzuela, 2020, p. 258).

Regarding the second research question (What roles does the haptic technology gain in the instructions and instructed actions?), the cases illustrate that the mobility stick gained different roles in the interaction. Firstly, it was treated as a thing, that is, as a mere technological device and a sensorial object that could be sensed through vision, sound, or touch (Streeck, 1996); secondly, as technology representing information, that is, the stick's vibration indicated that one's body was imbalanced; and thirdly, as an active participant in the interaction (cf. Day & Wagner, 2019; Nevile et al., 2014), that is, the vibration guided the human participants' actions. In the instructions combining verbal and embodied action, the technological device was first sensed through vision (i.e., when the stick was on the floor to be calibrated). The stick also occupied an imaginary role in INS1's bodily demonstrations with an imagined stick (as it did with P2's imitations of INS1's movements). In the transition from instruction to instructed action, when the stick was handed to the customer, the participants sensed it through touch, both as an object and haptic technology, and the customers reacted to the technology verbally, acknowledging the haptic sensation. The instructed actions were thus principally embodied but also verbal. When the customers started using the stick for the embodied exercise action, the role of the technological device changed from a mere object to a device that guided participant action, that is, instigating continuation or change in the customer's movement. In these situations, the mobility stick could thus be seen to have material agency, as it acted as a participant in the interaction in that the human participants reacted to the devices' vibration signals (or lack thereof) in their own actions.

The verbal references to the stick supported this change of roles. In their instructions, INS1 not only verbally referred to the stick as an object and technological device but also described the stick as an active participant, suggesting that the stick had a specific interactional function; it "provides feedback", "warns," and "teaches." These verbal references to how the technology functions with the customer are significant, suggesting that the stick is oriented to both as a technological device used by the human participants and an actor guiding human action. Once the customers start doing the exercises, we can see how the haptic sensation (or its lack) guides the customer's movement and INS1's orientation to the activity, both verbally and bodily (see Extract 1, fig. 7). Here, the findings resemble those of vom Lehn et al. (2007), where the technological system could be seen to turn the museum customer into a user when the system registered the customer's movement. In our data, this kind of user-action (customer using the mobility stick) system-response (haptic feedback or no haptic feedback from the stick) sequence was further followed by participant action (adjustment of customer movement or

continuation of movement as is), suggesting that the stick was allocated a participatory role.

While the instructor acted as a mediator between the customer and the new technology, the technology's interactional role changed as the customer learned to interpret its signals and subsequently either continued their ongoing bodily movement or modified it. In effect, we could say that the participation framework (Goffman, 1979) of the interaction shifted: first, there were two human participants and the technology as an object, but when the customer started to interact with the stick, the technology gained a participatory role. Indeed, we would argue that for the training to be successful, the customer needs not only to learn the meaning of the stick's haptic function but also to accept the participatory role of the stick in the interaction. This requires physical ownership of the object (Day & Wagner, 2019; Lindwall & Ekström, 2012) and embodied learning of the technology (cf. Mondada, 2016; Stuckenbrock, 2014). The findings thus have practical implications for training in the use of such new technology. Especially from the perspective of developing the customer training, the mobility stick's joint embodied use as a means to make new technology understandable (as illustrated in Case 3) seems best at supporting customer learning. Through the joint embodied use of the stick the instructor could ensure the customer understood the haptic function of the stick, that is, that the stick vibrates, how it feels when it vibrates, and what it signals with the vibration. This kind of instruction seemed to provide the most effective transition to the exercise, as it meant that the customer already knew what the vibration indicated when they started doing the exercises, and that they could anticipate the vibration when doing the movements. In all, the findings suggest the importance of embodiment and sensoriality in relation to verbal guidance in instructions and instructed action when learning to use new haptic technology.

We have drawn on video data, which have their limitations in reproducing individual sensory experiences related to the mobility stick's vibration. However, as Cekaite and Mondada (2021, p. 18) argue, "video recordings are a way to access the public and intersubjective dimension of a touching interaction. They enable a reconstruction of the perspective of participants witnessing the event – revealing the social intelligibility of what happens." Video data have thus enabled us to consider the role of the haptic technology in the sequences of instruction and instructed action, even if further studies could consider an exploration of individual sensory experiences with other methods. With reference to our findings, we urge future research to further examine user engagement with new technologies from the perspective of social interaction to identify how individuals creatively learn to function with them and to consider the types of human support that can best foster the implementation of and engagement with new technologies. These studies are increasingly important in today's technologized societies, where human-technology relationships have become increasingly complex.

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OTSIKKO JA ASIASANAT SUOMEKSI:

Uusi teknologia haltuun multimodaalisen ohjauksen avulla:
Älykeppi asiakaskoulutusvuorovaikutuksessa

ASIASANAT: asiakaskoulutus, haptinen teknologia, keskustelunanalyysi, käyttäjätestaus, multimodaalisuus, ohjattu toiminta

Appendix: Transcription conventions

sign	meaning
INS1	Instructor present in room
INS2	Instructor on Zoom
P#	Customer
+	Instructor's embodiment and gaze IN SMALL CAPS
*	Customer's embodiment and gaze IN SMALL CAPS
'	Signals from technology IN SMALL CAPS
(.)	Micropause in talk
(1.0)	Pauses in talk in sec
[ ]	Overlapping talk
(text)	Uncertain transcription of talk
(xx)	Unclear talk
!	Rising intonation
bold-italic	Glossing
=	Latched utterances
->	The action described continues across subsequent lines
->+ / ->*	until the same symbol is reached
fig	the moment at which a screen shot has been taken is indicated in the descriptions