4 Multimodal negotiation for the right to access digital devices among elderly users and teachers

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Abstract:

This chapter examines the multimodal ways in which teachers gain visual and haptic access to the students' digital devices to solve problems encountered by them. The setting is a digital skills course aimed at the elderly. Depending on the nature of the problem, and the teacher's epistemic status, the problems were resolved in two possible ways: 1. through instructional demonstrations 2. through problem-solving. Demonstrations were utilized when the encountered problem was treated as a *learnable*, while problem-solving was engaged when the problem was treated as a *solvable*. In cases of *learnables*, the teachers first sought to resolve the issue via multiple modalities which would allow the student to remain in control of the device. If these modalities proved unsuccessful, the teachers would resolve the issue through an instructional demonstration and accompanied rapport-building turns-at-talk. *Solvables* were resolved in a more direct way by the teacher taking immediate control of the device.

Keywords: digital skills, classroom interaction, embodied interaction, demonstration

In the recent years, two global megatrends have become particularly prevalent in the Nordic countries: the digitalization of services and everyday interactions and the rapidly ageing population. At the intersection of these developments are the elderly users of digital devices, an often overlooked or inherently problematized group (e.g., Alexopoulou, 2020; Cutler, 2005). While not necessarily the earliest adopters of novel technologies, the elderly in Nordic societies are none the less a growing user group of ICTs (Oksman, 2006). This fact is recognized in Finland, where several state-funded initiatives such as *Kansalaisen digitaidot* (*Citizens digital skills*, see https://kansalaisopistot.fi/kansalaisen-digitaidot/) have been launched with the goal of ensuring that the citizenry has the skills required to participate in the discourses of a digitalizing society.

This chapter provides one micro-level examination of how exactly such skills are taught. The setting examined is a state-funded course in an adult education center focusing on the use of digital devices (smart phones, laptops, and tablets), and aimed specifically at the elderly. In this course the students have the opportunity to either learn to use their own digital devices or borrow devices from the classroom and practice using them. This chapter focuses on moments of trouble, where the students have encountered a problem with their device(s) that they cannot immediately solve

themselves and where assistance from the teacher is recruited (Kendrick & Drew, 2016). This chapter seeks to uncover how haptic, intermedial, access to the digital devices is multimodally negotiated between the student and the teacher.

Digital devices, such as smartphone and laptop computers, are not simply physical items, but rather objects which grant access to another, digital, medium (Elleström, 2018; Rippl, 2015; Thurlow, 2015). As such, using them is an intermedial affair which requires the objects to be treated both as physical and as digital artefacts. Bridging these two mediums is the user of the device, who needs both visual and haptic access to the device to successfully operate them. As might be expected when dealing with intermedial objects, any issues in their use may stem from either medium, the physical or the digital. An example of a physical problem would be a student struggling to locate the correct place on their laptop to plug in their mouse. Conversely, failing to locate Google image search would be a problem stemming from the digital medium. Several studies have reported on the variety of physical problems or limitations the elderly encounter when using digital devices (McCleod, 2009; Roupa et al. 2010). Similarly, the digital medium can also present challenges for the elderly (Czaja & Lee; 2002; Leung et al, 2010; Lin et al. 2009; Mallenius et al. 2007). The medium of the problem dictates the medium (and modality) of the solution. When the problem arises from the physical nature of digital devices the solution is presented in the physical medium. When the problem encountered stems from the digital nature of the devices, the solution requires both digital and physical mediums to be engaged.

As Tuncer and Haddington (2019, p. 2) note in their discussion on object-transfers, there is a growing interested among scholars in the field of multimodal interaction to examine objects in interactions (see e.g., Fox & Heinemann, 2015; Horlacher, 2019; Rossi, 2014; Takada & Tomoko, 2015). The role objects, and their transfers, play in various social actions such as requests (e.g., Dixon, 2015; Rauniomaa & Keisanen, 2012), directives and offers (e.g., Rossi, 2014) is a topic which has recently been examined in both every-day (e.g., Zinken & Ogiermann, 2013) and institutional settings (e.g., Heath et al., 2018). When examining objects in interaction, it is important to discern whether the interactions are *object-centered* (Tuncer et al., 2019) or *object-implementing* (Weilenmann & Lymer, 2014). In the latter, objects are present and utilized as resources in the interactions. In the former, objects form the very core of the interaction, becoming the topic of the discussion, and, especially in institutional setting, shaping the course and structure of the interaction, as is the case in the data set examined for this study.

When engaged in resolving the student's problems, the teacher's institutional role as an educator becomes particularly pronounced. Many of the problems encountered by the students might quite

easily be resolved by the teacher simply taking control of the device and performing the necessary steps themselves. However, in the data, this does not often happen. Instead, most of the problems are resolved via a relatively lengthy sequence where multiple modalities such as spoken instructions and directives, physical gestures, and finally, demonstrations are employed to reach a solution. This is because some of the problems are treated by the teacher as *learnables* (Majlesi & Broth, 2012), meaning that understanding the *ways of achieving the solution* is considered by the teachers to form an important pedagogical goal for the student. Here, the journey is more important than the destination. By contrast, some problems are, indeed, resolved in an expedient manner by the teacher personally taking control of the device. In such instances the problem encountered was deemed by the teacher to be *solvable*. In such instances, arriving at the destination is considered by the teacher to be more important than understanding the journey. A further consideration which may influence the teacher's approach to the problem is their institutional responsibility for ensuring the progressivity of activity. They need to make sure that the class advances, which oftentimes requires more expedient ways of resolving individual students' issues.

While the data also features more traditional teacher-led lecture phases, especially in the beginning part of the sessions, a large majority of the time spent in the class is dedicated to the students practicing using their devices "hands on". The teachers walk around the class and respond to any questions or issues raised by the students (see e.g., Greiffenhagen, 2012; Jakonen, 2020). In doing so, the teachers typically engage in two types of activities: problem solving and instructional demonstration. Both activity frameworks (e.g., Broth & Mondada, 2013) require that the teacher has, at least visual, but ideally, haptic access to the digital device being operated by the student(s). Whichever activity the teacher engages in, they first need to access the student's device, a process, which presents some deontic considerations.

1. Data set and methodology

The course examined in this study took place in an adult education center located in a city in Northern Finland during the spring of 2020. All together the course comprised of 12 three-hour sessions. The sessions were structured around specific topics, such as 'social media', 'word editors', and 'Google services'. The sessions began with the teacher giving a brief introduction to the topic of the day and handing out tasks which the students were expected to finish during the class. However, in every session the students were encouraged to ask the teachers questions and help on any topics or problems they might encounter when using their devices, regardless of whether they

were related to the topic. Indeed, many of the students utilized these sessions to ask questions on problems they encountered during the week between the sessions. The course had two teachers per session as well as one or two "digital volunteers" (volunteer workers trained by the adult education center to assist with issues related to digital devices), serving as teaching assistants. Furthermore, in addition to filming the sessions, the researcher also assisted the students when necessary. Altogether, the number of students in the class ranged between 15 and 22. The interactions were predominantly in Finnish, though one student was not a native speaker (being a native speaker of Russian).

In total, three sessions (9 hours) were recorded with multiple cameras. The recordings were done with 2-3 GoPro cameras, which were attached to shoulder or chest straps and carried by the teachers (and the researcher in two of the recorded sessions), one hand-held video camera carried by the research during one of the sessions, and one tri-pod mounted video camera stationed at the back of the class. To gain access to the setting, the researcher first volunteered to assist the teachers during the class, presented their research interests to the participants, and asked for the participants written consent to be recorded. Cameras were only introduced to the classroom on the sixth weekly session. For this study, the interactions between the researcher and the students have been excluded from the data set. The images included in the data excerpts provide the "point of view" of the teacher, acquired from the shoulder or chest mounted GoPro cameras. The chosen camera angle does not fully reveal the teachers' embodied actions. For this purpose, the camera stationed at the back of the class was utilized where necessary. An external audio recorder was also placed at a central location to ensure adequate sound quality of the recordings. Altogether, the recordings yielded roughly 33 hours of video data and 9 hours of audio data.

The primary methodology utilized in this study is multimodal conversation analysis (e.g., Mondada, 2016), which is a data-driven, microanalytic and qualitative research approach focusing on the empirical analysis of recordings made from naturally occurring interactions. Conversation analysis is, in essence, the study of social actions through the examination of the micro-level features of interaction. At the core of CA is the notion of the turn-taking organization (Sacks et al., 1974) and the various ways in which social meaning, institutions and roles are *talked in to being* (Heritage, 1984) within interaction. Conversation analysis examines the ways in which turns-at-talk are produced and organized sequentially to achieve a variety of purposes such as requests, offers, questions, answers etc. In this way, the microanalytic perspective of conversation analysis can, in fact, produce macro-level observation of the social world. The inclusion of the *multimodal* aspects of interaction, in the wake of what Nevile (2015) calls the 'embodied turn' of the last twenty to

thirty years of conversation analytic research, allowed for a re-examination of what already were thought to be well-established systematics of interaction. Examination of modalities beyond talk revealed novel ways to "build and interpret the public intelligibility and accountability" of situated actions (Mondada, 2018, p. 86). Indeed, as this study will show, problem-solving can be an inherently multimodal process, in which talk does play an important, though certainly not dominant role.

Typically, conversation analysts approach data without presuppositions in mind (Sacks, 1984; Schegloff, 1996), engaging rather in what is known as unmotivated viewings of the data. In this study, what drew the researcher's initial interest during these viewings were the moments of teacher touching or manipulating the student's digital device. There seemed to be two very distinct ways of gaining access to the device: a more straightforward and a more complicated way. Having built a collection of 40 such moments, with detailed multimodal transcripts, the initial analytic goal was to discern the potential reasons for the teachers touching the students' devices in the classroom. As the language spoken in the class was Finnish, the transcripts include an English translation below the line indicating the original Finnish spoken turns in italics. In addition, this study utilizes the multimodal transcription format pioneered by Mondada (e.g., 2018) in which the onsets and endings of embodied actions are marked in relation to the spoken turns via symbols dedicated to each participant in interaction (see Appendix). In the transcripts TEA is an abbreviation of *teacher* and ST1 and ST2 of *student 1* and *student 2*.

2. Rendering assistance

Before examining the actual transfer of haptic access to the device, it is important to understand the history of the interaction preceding it, namely how, why, and by whom, it is initiated. The data set revealed that in every recorded instance, the actual physical manipulation of the device by the teacher is preceded by interactional sequence where assistance is recruited from the teacher. Kendrick and Drew (2016) introduced the concept of 'recruitment' of assistance as a framework encompassing

> "[…] the linguistic and embodied ways in which assistance may be sought—requested or solicited—or in which we come to perceive another's need and offer or volunteer assistance" (p.2).

In the majority of the cases observed, the recruitment is *self-initiated*, meaning that assistance is directly requested (e.g., Drew & Couper-Kuhlen, 2014; Enfield, 2014) by the students or offered by the teacher following the students reporting trouble. A few rare cases in the data can be classified as *other-initiated*, meaning that they comprise of the teacher either responding to students' displayed trouble or projecting potential future trouble and volunteering assistance. In keeping with the basic principles of adjacency pairs (Sacks et al., 1974) both requests and trouble reports by the students are directly followed by the teacher rendering assistance in the data. This is done via two potential paths: 1. the path of instructional demonstration; or 2. the path of problem-solving. The two pathways differ in the way access to the device is negotiated. The following sections will examine both modalities of rendering assistance as well as the multimodal ways in which the negotiation sequences unfold within them.

2.1 Instructional demonstrations

Goffman (1974, p.66) defines demonstrations as "performances of an activity outside its typical context in order to allow someone who is not the performer to obtain a close picture of the doing of the activity." By "typical context" Goffman refers to the natural setting in which the demonstrated activity appears in its original, unaltered form. In the context of this study, the original context could be thought to be the everyday moments where the digital devices are used by the students at home. When performed in a setting detached from the original context, this use of digital devices is transformed into a 'keying' (Goffman, 1974) and is thought to be altered. Once an original activity becomes a keying, it receives additional, context-sensitive elements. The teaching context, for instance, introduces supportive and annotative aspects to the activity of handling digital devices (e.g., Clark & Gerrig, 1990).

The first immediate observation stemming from the data regarding the embodied negotiation sequences preceding instructional demonstrations is that they nearly always follow either the teacher issuing instructions (e.g., Stefani & Gazin, 2014) in a variety of formats ranging from directives (Craven & Potter, 2010; West, 1990;) to deictic and multimodal locating statements ("se on tuolla" *it's in there*, accompanied by a pointing gesture*)* or the student directly offering the device to the teacher. Even in the latter case the teacher may at first decline to accept the device and provide the student with verbal instructions. Direct physical manipulation of the device appears, evidently, to be something of a dis-preferred modality when instructing the use of digital devices to the elderly.

In the following example the teacher (carrying a GoPro camera on a shoulder strap), standing in front of a screen at the front of the class (see img1), has given the students a task of creating a new folder on the desktop of their laptop computers. The theme of the session is resource management in a windows computer, and the students have just prior been instructed to locate and open "This PC" (fin. *Oma tietokone*), from where they must locate and open the "Desktop" (fin. *työpöytä*)" folder under "Quick access" (fin. *pikakäyttö*). The excerpt begins with the teacher instructing the whole class where to locate the Desktop folder. One of the students (ST1, sitting on the extreme top-left corner of img1) reports trouble by stating that the computer "won't let me".

Excerpt 1

<Insert fig. 4.1>

<Insert fig. 4.2>

The student's initial trouble-report on lines 5-6 is produced in a lower volume and it is not necessarily directed at the teacher. In fact, as can be seen from the two small screencaps in img2, it is one of the nearby students who leans towards ST1's (sitting right-most in the two images) computer, possibly to assist her. On line 3 the teacher walks over to the screen and points at the desktop folder (img2.), providing visual context for her upcoming question. She then asks the entire class in a raised volume whether they have managed to open the desktop folder on line7, providing the interactional space for reporting trouble or asking for assistance. Following this, ST1 re-verbalizes her trouble-report on line 8, prompting the teacher to approach her (lines 9-11, img3) and ask her whether she managed to find the Desktop folder on line 10. On line 11, the student, partly in overlap with the teacher's question, states that she had indeed found the folder but is unable to open it. Having reached the student and her computer, the teacher brings her left hand in a pointing gesture towards the screen (img4). At first, she brings the index finger close to the left of the screen where the quick access bar can be found (img5). After, this she brings the pointing gesture towards the Desktop symbol (img6). In this way, she establishes that ST1 has indeed managed to locate the correct object on the screen.

On line 11, the student invites the teacher to witness as she re-enacts the issue (Evans & Reynolds, 2016; Tutt & Hindmarsh, 2011) and clicks on the Desktop. Following, and partly overlapping with this re-enactment, the teacher issues the first instructions in a directive form on line 12 (öö:: (.)kaksoisklikkaa – *umm:: (.) double click*). During this instructional turn the teacher also performs a clicking gesture with her left index finger and returns the hand to home position (Cibulka, 2015; Sacks & Schegloff, 2002) (img7-8). During the ensuing 2.9 second silence the student proceeds to click on the trackpad two times, failing to pace her clicks fast enough for the computer to register

them as a double-click command. During ST1's failed attempt to follow the teacher's instructions, the teacher gradually brings her right hand closer to the trackpad with her index finger extended (img9). During lines 13-14 she performs another more pronounced clicking gesture with her index finger (img10). Whether or not this gesture is produced specifically for-witness by ST1 is somewhat unclear. It is, however, certainly witnessable (Nevile, 2007) and functions as an embodied demonstration of the necessary movement. Following the third failed attempt to open the Desktop folder, and the teacher's clicking gesture, the student retracts her hands from the trackpad (line 14, image 11), thus relinquishing her control of the device and providing the physical space required for the teacher to resolve the issue.

Following this relinquishing, the teacher brings her right hand to the trackpad and successfully double clicks on the Desktop (lines 14-15, img12), performing another embodied demonstration of double-clicking and accompanying it with an annotation (Clark & Gerrig, 1990) on lines 16-17. While she double clicks on the icon, she produces a turn at talk on line 14 whose function is twofold: it accounts for the teacher taking control of the device, and it builds rapport between ST1 and TEA. In the data, the teacher always produces some variation of this "control-assuming turn" just prior to, or during, the moment when she handles the device. In this excerpt, the rapport is built on the premise of the computer refusing to obey ST1's (and TEA's) commands, utilizing the negative (semi)auxiliary verb construction *ei anna mennä* (won't let [you] go). Of note, is the fact that the ditransitive verb *antaa* in this construction is lacking the indirect object, the person who is not 'let go' (e.g., 'you'), resulting in a connotation of the computer refusing entry to the Desktop regardless of the person using it. In this way, the turn at talk on line 14 also has a face-saving function. Other common modalities of this control-assuming turn encountered in the data include: use of the plural first person form of the verb 'look' – 'katsoa' in indicative form (*katsotaan* – let's look); imperative form of the verb 'show' – 'näyttää' combined with softening tone particles '-pä', '-päs', or '-s' (*näytäpäs, näytäs* – show me)[i]; and straightforward requests such as '*Saanko katsoa?* – Can I take a look?'. In summary, the grammatical formulations of the control-assuming turn seem to indicate that the teacher strives to establish a joint cause shared by two deontically equal parties. It is the student who shows the device to the teacher, and it is the student and the teacher who both look at it. Most importantly, it is the device that seeks to thwart them both.

In this excerpt, the teacher treats the reported trouble primarily as a learnable (Majlesi & Broth, 2012). This becomes evident through the variety of instructions she produces prior to handling the device herself in an instructional demonstration. At first, she seeks to locate the correct object on the screen through a pointing gesture. Having done this, she provides instructions in both verbal and

embodied form. Seeing that her instructions have not resolved the issue, she slowly brings her right hand closer to the device. This gradual, phase-by-phase approach to the device allows the student the opportunity to resolve the issue on her own before the teacher must resort to an embodied demonstration on the device itself in order to secure the progressivity of the activity. The data suggests that once a problem is deemed 'learnable', the teachers in their embodied and verbal interaction display a marked preference for the student to remain in control of the device. Indeed, it is easy to argue that the learnable in this excerpt – double-clicking with the trackpad – is something that is best learned via doing as acquiring the correct timing and precision requires haptic access to the device. Often, when instructional demonstrations are utilized, they seem to be something of a last resort.

2.2 Problem-solving

At times, the teachers treat the students' problems with the digital devices as 'solvables' rather than as 'learnables'. In such instances, the negotiation for the right to access the device seems to be much more straightforward. The interactions preceding the actual handling of the device by the teacher do not, to the same extent as in the previous excerpt, build rapport between the two. Instead, the teacher's deontic authority over the student becomes more pronounced in these problem-solving sequences and the student's agency (Ahearn, 2001) seems to be diminished. Two distinct categories of 'solvables' can be identified from the data. Certain problems may be treated as too simple to be worthy of pedagogic focus. Conversely, certain problems may be treated as too complex or time consuming to be resolved via step-by-step instruction. In addition, with over 15 participants in each session, the teachers conduct can certainly be influenced by the fact that they are pressed for time. Often, simply resolving the issue themselves is the most efficient way of securing the progressivity of the activity.

The next excerpt takes place at the very beginning of the session. The students are engaged in taking their seats and turning on their laptops or tablets. Just prior to the beginning of the segment, the teacher, wearing a chest-mounted GoPro camera and standing in front of the class, has finished going through a list of attendees for the session. Sitting left-most on img1 is ST1, who is struggling with her laptop (a device she has borrowed from the classroom). She turns the closed laptop around, simultaneously moving two cords around: evidently searching for the correct ports for the power cord and the mouse. Whether or not the teacher pays attention to ST1's issues with the laptop is

unclear, but after the student turns the laptop the wrong way (the screen facing the teacher, see img2), the teacher begins to walk towards the student (img3).

Excerpt 2

<Insert fig.4.3>

<Insert fig.4.4>

Unlike in the first excerpt, here the recruitment of assistance is other-initiated (Kendrick & Drew, 2016). The student does not shift her gaze towards the teacher as she turns the laptop in front of her. Here then, the teacher responds to perceived trouble by the student and volunteers her assistance. As the teacher is walking around the table separating her from ST1, she begins to resolve the first issue the student faces: ST1's desk is cluttered with different cords. While assuming control of the device on lines 4-6 she produces the spoken turns *sen voi oikeastaa jättää pois tämän- tämän johdon – tätä ei tarvita tässä vaiheessa* – (*that can actually be removed- this cord- this is not needed at this point)* and takes hold of the power cord, which, as can be seen in the last frame of image 4, the student is still holding, and places it aside. The turn establishes to the student that the power cord is unnecessary. The laptops have been fully charged prior to the class. The student, in overlap with the teacher, confirms this on line 7 (*not needed at thi-*), to which the teacher provides a response on line 8.

After the cord is removed from the student's hands, ST1 takes a hold of the laptop with both her hands (line 7, img5). After setting aside the cord, the teacher also takes hold of the laptop (img 5). The student immediately relinquishes her hold of the device, and the teacher turns it so that the screen will be facing the student once the device is opened (lines 9-10, img6). The teacher then begins to resolve the next issue: locating the USB-port for the mouse cord. While setting the device down after turning it, the teacher produces a pointing gesture with her right index finger towards the USB-port and produces a locating statement on line 12 (img7). While syntactically formulated as a question and potentially produced as self-talk (for discussion on self-talk in educational settings, see Hall & Looney, 2021), the accompanying pointing gesture marks this turn as directive (Craven & Potter, 2010; Ervin-Tripp, 1976), prompting the student to provide an embodied response by plugging in the mouse cord on lines 13-17. Directly after the pointing gesture, the teacher brings her right hand on top of the laptop (lines 12-13), to a position from which the screen can be lifted. After the student plugs in her mouse (first frame of img8), the teacher pulls open the laptop screen (last

two frames of img8), annotating her actions on line 18. At the end of the segment, the teacher produces a directive to turn the device on, after which she walks back to the front of the class, taking the power cord with her.

Compared to the learnable of the first example – the act of double clicking on the mouse – the issues encountered by the student on excerpt 2 are primarily treated as a solvables and subsequently resolved in a more direct and rapid fashion. The teacher does not hedge her hands in phase by phase towards the device. She does not initiate the problem-solving by providing verbal or embodied instructions, but rather immediately takes control of the power cord and device, in two occasions taking an object directly from the student's hands. In excerpt 1, the student first relinquishes control of the laptop by retracting her hands prior to the teacher handling the device. In excerpt 2, the student's and the teacher's hands are both touching the power cord and the laptop before the student lets go of the objects. The teacher's turns at talk do not build rapport between ST1 and TEA and are often produced in overlap with the ST1's turns. The student also produces a truncated turn at talk on line 11 which prompts no response from the teacher.

Excerpt 2 is an instance where the problem to be solved is treated as a solvable likely because teaching it via talk and demonstration is both unpractical and needlessly complex. Furthermore, verbally walking the student through the problem might be considered a face-threatening act, potentially coming across as patronizing or condescending. The acts of setting a power cord aside, turning a laptop the other way and opening the screen are easier done than said. Rather than going through a set of instructions and directives the teacher most likely finds it more expedient to resolve the issues herself. She does still verbally account for her actions on lines 17 and 20 in an annotative way which both suit and reinforce the institutional and instructional nature of teacher-student interactions. Nonetheless, the way the teacher approaches the student's problem in excerpt, 2 and in the data in general, indicates that the handling of digital devices and attached paraphernalia (such as power cords) as physical objects do not form the pedagogical core content of the sessions, and thus tend to not be established as learnables in interaction. Rather, to ensure the progressivity of the class, the teachers often resolve such practical and physical problems themselves.

Excerpts 1 and 2 both feature problems which the teachers manage to resolve relatively fast because in both instances the source of students' trouble is immediately evident, as is the solution. This is largely due to the way in which the problem is made visible, either intentionally or unintentionally, by the students. In the first excerpt the teacher can witness the student's slow double-click on the trackpad and observe the resulting non-response from the device. In the second excerpt, the student is seated close to the teacher who can directly observe her moving the computer and related

paraphernalia around. The teachers do not need to dedicate time to understanding the problem themselves prior to assisting the student. At times, however, the issues the students encounter are not as easily identified or resolved. Excerpt 3 features a situation where the teacher at first must handle the device personally before the problem can be pinpointed and resolved.

In the following excerpt, ST1 (handling the tablet in img1) is attempting to show ST2, who is sitting next to her, a game she used to enjoy playing on her tablet. The teacher, wearing a shoulder-mounted GoPro camera, is leaning on the table to the right of the two students. The game ST1 attempts to show is evidently an instructional game which teaches coding, and the student has not played it, according to her own words, in two or three years. As she tries to open the app, found under the My Playgrounds sub-folder, the game fails to start. Not included in the transcript is a preceding two-minute segment where ST1, ST2 and TEA discuss different games they, their children or grandchildren have played. It is during this discussion that ST1 first brings up the coding game, which she then proceeds to try to demonstrate to her co-participants. Prior to the segment included here, she has unsuccessfully attempted to open the app one time. Her second failed attempt (lines 1-2, img 2) and the accompanying trouble-report prompt the teacher to engage in solving the issue.

Excerpt 3

<Insert fig.4.5>

<Insert fig.4.6>

In the very beginning of the segment ST1 can be seen tapping on the game icon (first frame of img2) which moves the icon on the screen to the top left corner (second frame of img2). There, the icon changes shape and color. The student taps on the icon again (third frame of img2), which removes the icon from the screen (final frame of img2). While engaged in tapping on the icon, the student first produces a trouble report (line 2), a trouble alert (line 3), followed by another trouble report (line 4). Following this combination of recruitment modalities (Kendrick & Drew, 2016), the teacher moves (lines 5-7) to a position between ST1 and ST2, from where she will have a clearer visual, but more importantly, haptic access to the device (img3). As she moves closer, she produces a turn at talk on line 5 which indicates that she will seek to acquire visual access to the device (mitä siellä on – *what's in there)*. Coinciding with the teacher arriving on the new location, ST1 leans back on her seat, thus providing the teacher more room and facilitating easier haptic and visual access to the tablet. The student's turns at talk on lines 6-7, ST1 provide a potential account on why

she is struggling to open the game: she has not played it in two or three years. They also function to establish the student's epistemic status regarding the game as 'knowing (K+)' (Heritage, 2012).

Lines 9 and 10 feature overlap where ST1 produces an assessment of the game and TEA reads aloud the name of the sub-folder in which the game icon can be found. Turn 10, produced with a lower volume of voice while assuming control of the device, does not build rapport between ST1 and TEA. The student's assessment on line 9 prompts no response from the teacher, who proceeds to tap on the game icon with her right index finger (line 11, img4). At the moment of touching the screen, she says the name of the game "*Learn to Code"* again with a lower volume of voice (line 11). The game icon can be seen moving to the top left corner (img5). The teacher responds to this with a rising intonation on line 13, after which she says the name of another game found in the My Playgrounds sub-folder *Hello byte/bite* (once more in lower volume of voice) and proceeds to tap that icon as well (line 15, img6). By verbalizing the different icons, she sees on the screen (on lines 10, 11, and 15), the teacher most likely seeks to signpost to the student her own process of problem-solving. The icon of the second game is also seen to move to the top left corner of the screen (img7). Following this, ST1 tells the teacher more about the game on line 16, a turn at talk which again asserts her K+ status but prompts no response from the teacher. Having witnessed both icons move to the top left corner of the screen and change shape, the teacher evidently discovers the source of the problem, and provides an account and a solution (on line 17) on why the game fails to start: it is being downloaded to the tablet. It is likely that the long hiatus (two to three years) the student has taken in playing the game has forced the device to install updates to the game as the app is being opened. As the student was tapping and re-tapping the icons, she was in fact starting and cancelling the download process.

To be able to assist the student, the teacher requires haptic access to the device. She must tap on the icon on the tablet herself to understand the process which follows. It is important to also note that unlike in excerpts 1 and 2, the problem encountered by the student in excerpt 3 is also shared by the teacher, who at the beginning of the segment is equally unaware of the solution. Access to the device is not explicitly negotiated, as the teacher simply brings her index finger to the screen. The student facilitates this by not resisting the teacher's actions. Teacher's quick access to the device is further facilitated by the student who leans backwards as the teacher takes her position between ST1 and ST2. The student's ignored turns at talk on lines 9 and 16, and the quiet production of the annotations of the teacher's actions on lines 10, 11 and 15, indicate that TEA is engaged on discovering a solution and not on demonstrating. The teacher's turns at talk do not pinpoint the trouble or provide instructions prior to turn 17, where she can clearly state to the student the source

of the issue. Excerpt 3 suggests that the way in which control of the device is transferred to the teacher is dependent not only on the teacher's institutional role as an expert, but also on her actual epistemic status regarding the encountered problem. To treat an issue as a learnable, the teachers must understand it themselves. If this is not the case, the issue is treated as a solvable and control of the device is transferred in a more straightforward manner.

Excerpts 1 and 3 show that teachers seem to treat learning in the context of digital device use as a primarily haptic process. In Excerpt 1, the teacher exhausts a selection of modalities which facilitate for the student to remain in control of the device for as long as possible. Arguably, the best way to learn the timing of the double-click is repeated attempts. In Excerpt 3, it is the teacher who at first must make sense of the trouble, and subsequently requires immediate haptic access to the device before being able to teach the student. For the teacher to acquire an understanding of the trouble in Excerpt 3, verbal instructions issued to the student would likely have proved to be a needlessly complicated method. Conversely, when there is nothing to learn, as is the case in excerpt 2, student's haptic access to the digital device, can be discarded to resolve the issue in a more expedient fashion.

3. Concluding remarks

This study set out to examine the activity contexts where teachers handle the students' devices. Examination of the data revealed that this is done to render assistance to the students in moments where they have encountered a problem. When engaged in responding to students' self-initiated recruitment of assistance (Kendrick & Drew, 2016), that is, requests of assistance or reports of trouble, the modality of the rendered assistance is not dependent on the modality of the recruitment, but on the nature of the trouble as well as on the epistemic status of the teacher.

When issues encountered by the students in the classroom are "interactionally established as relevant and developed into a shared pedagogical focus" (Majlesi & Broth, 2012, 1), they become learnables. Learning to use digital devices requires haptic access to the devices in question. As shown in the three excerpts, this holds true both for the students and the teachers. In excerpt 1, the teacher provided the student with ample opportunity to resolve the issue herself prior to resorting to an embodied demonstration. In excerpt 3, the teacher first must handle the device herself to familiarize herself with the problem, before she can resolve it. The multimodal negotiation sequences preceding embodied demonstrations reflect this preference for hands-on-learning. The

teachers tend to use verbal and gestural instructions prior to assuming control of the device. When they do, they seek to build rapport between themselves and their students.

It is interesting to note that whether the digital device is actually owned by the student has no impact on the way transfer of access is conducted by the participants. The laptop computer featured in excerpt 2 was the property of the adult education center, while in excerpt 3 the featured tablet belonged to the student. In both cases, however, the transfer of access followed a similar, straightforward path. Deontic considerations pertaining to the ownership, or indeed perceived epistemic authority regarding the details and use, of said device seems to play no role when the teacher engages in problem-solving. Though not discernible from the included excerpts of this chapter, the data set revealed that this holds true for instructional demonstrations as well. There were no clear differences in the way transfer of access is negotiated for the purpose of instructional demonstration depending on whether the devices were borrowed from the classroom or brought by the students themselves.

It is, however, undeniable that digital devices such as tablets and smartphones are personal objects and gaining access to another's device would normally require a negotiation sequence where a reason for transferring the object is given. Evidently then, the classroom, as an institutionally laden space, influences the participatory roles of not only people, but of objects. The nature of these devices changes the very moment they are brought to the classroom by the student. They turn from personal devices to shared pedagogical tools, and as such can be accessed by the teacher more readily. Conversely, when examining the ways in which the teachers deploy multiple other modalities prior to physically demonstrating the solution to a problem, and the way in which they seek to build rapport with the students, it becomes clear that any devices the teacher brought to the class have also, to some degree, become a shared property of the student and the teacher. Traditionally, classroom settings see the teachers endowed with a certain level of epistemic (e.g., Heritage & Raymond, 2005) and deontic (Stevanovic & Peräkylä, 2012) authority over the students. However, the teachers' conduct in the examined negotiations seems to suggest that the students also exert certain authority over the teacher in relation to the ownership and right to access their digital devices (regardless of who actually owns said devices).

The setting examined in this chapter seems to be so clearly object-centered (Tuncer et al., 2019) that instead of object-transfers or transfers of access, it might even be justifiable to discuss of *transfer of usership*. After all, as the excerpts show, the devices themselves do not physically move a great deal, nor does the goal that the participants seek to achieve with devices change. It is, rather, the people using them that re-configure their participation in relation to these devices. The findings

discussed in this chapter suggest that the participants in their interactions actively seek to resolve issues in collaboration, striving for joint problem-solving. The interactions examined here show a marked preference for shared access to the device, a preference which is displayed in the conduct of both participants.

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APPENDIX. Transcription conventions

<Insert Table 4.1>

[i] It is interesting to note that the data does not include a single instance of the teacher utilizing the imperative form of the verb 'give' – 'antaa' in its literal meaning (*anna* – give me) when assuming control of the device. The verb 'show' – 'näyttää' certainly assigns the student more agency (Ahearn, 2001) than 'antaa' – the student allows the teacher a glimpse of the device even when the device is held and controlled by the teacher.