

Theoretical Framework and Methodology for Exploring Instructional Videos for Cashier Work

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Abstract

The study described in this paper is part of a thesis project consisting of three empirical studies researching work and work-based training and learning in connected workplaces. The specific case is sales assistants' work and skills in connected stores, focusing personal customer meeting practices on the sales floor and at the checkout. The first study explores work-based training for cashier work through instructional videos. In the second study, the focus shifts to explore work-based learning through apprenticeships education in the connected checkout. The third study explores sales assistants' work in connected stores focusing on the personal customer meeting on the sales floor and at the checkout. Theoretical framework and analytical tool in all of the three studies is the theory of practice architectures (Kemmis et al., 2014; Mahon, Francisco, & Kemmis, 2017). This recently developed practice theory builds on Schatzki's (2001) concepts of practice and the critical insights of Habermas (1974) and assumes that social reality consists of a variety of practices that we daily, without further reflection, engage in and take for granted.

This paper reports on the theoretical framework and methodology of the first empirical study, work-based training for cashier work through instructional videos. Instructional videos and film are since long an educational resource used in both workplace education and formal education (Spector, 2015; Wiatr, 2002). In the first half of the 20th century, pictures were considered more accessible than written text. They were therefore used as a resource for transference, for example, information, workplace norms, values and processes more rapidly and thoroughly. In the 21st century, video lectures are used in, for instance, Massive Open Online Courses for delivering lecture content (e.g. Johnston, 2015). In health care educations medical television programs, such as Grey's Anatomy are popular among health profession trainees communicating typical work situations in advance of workplace learning (Hoffman et al., 2018; Jubas & Knutson, 2013) (2015). Winch and Cahn (2015) report on a study implementing supplementary online video tutorials to improve student performance in a management science course. In the context of this paper, instructional (including, presentation, lecture, training, tutorial, screencast) videos are understood as part of many pedagogical practices within networked learning.

Instructional videos for cashier work in checkout practices have been used since the 1910s as a technological resource in workplace training. The study described in this paper explores, among other things, the relationship between technology evolution and the formation of checkout practices and the cashier profession over time. The study was conducted between 2018-2019 using online video research in combination with a literature study of retail technology evolution. The data material consists of 50 instructional videos for cashier work produced between 1917 and 2010 and published on YouTube. The analysis was conducted in five steps, "zooming in" and "zooming out" (Nicolini, 2012) the checkout practices demonstrated in the videos using the theory of practice architectures as a theoretical lens and analytical tool.

Keywords

Instructional videos, online video research, work-based education, pedagogical practices, cash register, information technology, POS systems, cashier vocation.

Introduction

The increasing pace of technology evolution in the 21st century has raised issues about the relevance of vocational education and training and how to ensure the skills requirements of the labour market (e.g. Hiebert & Borgen, 2002). The retail sector is one of the industries fundamentally transforming due to the ongoing digitalisation in society. The research on the consequences of technology evolution for sales assistants' work, competencies and work-based training and learning, however, is still limited. Technology evolution changing workplaces, work and skills requirements is not new. Ever since the beginning of the 1900s, the checkout in brick-and-mortar stores has been the site for monetary transactions in connection with customers' purchase

completion. Just as long, the cash register, invented in 1879, and information systems for handling money, transactions and merchandise have been the hub in checkout practices and sales assistants' work (Basker, 2016; Crandall, 1997). Against this background, the evolution of technology and information systems in the 20th and 21st century may be believed to have contributed to shape, reshape and change sales assistants' competencies and work in checkout practices. Almost as long, instructional videos have been a means for training sales assistants and cashiers for work in checkout practices. The instructional videos were and still are regarded as a resource-efficient way of transferring values, norms, ideas and working methods to employees, learners and students.

Developing vocational education and training for an increasingly connected work-life requires a look back on the development of specific professions and pedagogical practices such as instructional videos (e.g. Grossman, Hammerness, & McDonald, 2009; Mahon, Francisco, & Kemmis, 2017). To enable such a look back of the sales assistant profession, and training for cashier work, 50 instructional videos for cashier work produced between 1917 and 2019 and published on YouTube are used as the data source. The theory of practice architectures (Kemmis et al., 2014; Mahon, Francisco, & Kemmis, 2017) is used as a theoretical lens and analysis tool to answer the following research questions:

- What role has the technology evolution, e.g. the cash register and point of sale (POS) systems, played in work-based training for cashier work over time?
- What relationship exists (or not) between technology evolution and the formation of the sales assistant profession and cashier practices?
- How has instructional video practices for cashier work changed over time?

This paper gives a short introduction to instructional videos in workplace education and training, followed by a description of the study's theoretical framework and methodology.

Technology and instructional videos in work-based education and training

Technology evolution and the development of professions and education have since long been intertwined. At the same time, new technology has also been contested, sometimes perceived as a threat to professions and formal education (Autor, 2015; Hrastinski et al., 2019; Michalik, 1996). The increasing availability and use of information technology (ICT) and mobile devices in the 21 century are changing all aspects of life. In vocational education and training, ICT and mobile devices have opened doors to new forms of learning and teaching, flexible in time and space. Educational concepts such as e-learning, "flipped instruction" and "flipped learning" have emerged as popular approaches in workplace education by its availability, just-in-time delivery, and cost-effectiveness (Nederveld & Berge, 2015; Tynjälä & Häkkinen, 2005; Wang, 2011). E-learning, as understood by the author of this paper, is an umbrella term that describes education using electronic devices and digital media. Examples of E-learning is trainees or employees participating in online courses, webinars or virtual reality (VR) simulations of specific work activities. They can view or interact with instructional videos and participate in digital learning communities. The concept "flipped" refers, but is not restricted to viewing instructional videos in advance of participating in a seminar, lesson or work activity. The intention with flipped instruction is to actively maximise learning and retention by considering the best way to use the time in the classroom or work-based training (Nederveld & Berge, 2015). Instructional videos are forwarded as a promising resource to support learning, development and performance in workplaces. In an increasingly connected work and social life, instructional videos can deliver knowledge to employees in small portions exactly when they need it. As "flipped instructions", instructional videos are a means of reducing time spent on traditional workplace training of new employees and trainees.

Instructional videos are not a new phenomenon in workplace education (Wiatr, 2002). Already in 1913, Thomas Edison foretold "It is possible to teach every branch of human knowledge with the motion picture" (F. J. Smith, 2013). The National Cash Register Corporation, NCR, was quick to use this new medium and produced the silent film "The Troubles of a Merchant and How to Stop Them" in 1917. The aim with NCR's instructional film, also the empirical starting point of this study, was to teach the functions, benefits and consequences of implementing their cash register and mechanical point of sale system (M-POS) in stores. Since then, instructional films, followed by instructional videos, have been part of workplace and vocational education and training. In the 1990s, the comedian Lily Tomlin combined her perspectives on acting and business to produce the new medium, training videos. Tomlin's training videos aimed to look at a critical business issue, customer service (B. Smith, 1994). In the 2000s, it was envisaged that shared online video increasingly would find a role in teaching and learning. Another trend forwarded was that the content available for learning would be designed by learners or trainees, instead of being formally authored by an organisation or institution to that designed by learners or trainees (Bonk, 2013).

In the 2010s, the video-sharing platform YouTube, launched in 2005, has emerged as a growing platform for publishing instructional videos produced by technology innovators, vendors, individuals, educational providers and organisations (Lee, Osop, Goh, & Kelni, 2017). In February 2020, YouTube is the second most popular video-sharing site; every day, people watch 1 billion hours of videos (Statista, 2019) and 62 per cent of businesses use YouTube as a channel to post video content (Buffer, 2019). The easy access and availability to produce and publish instructional videos on YouTube have enabled individuals, small businesses, as well as organisations and educational providers to start video channels with specific interests. Such an interest is to convert and publish instructional films produced in the 20th-century long before the Era of the Internet, YouTube and smartphones.

Theoretical Framework

The theoretical standpoint and analysis tool for this study is the theory of practice architectures (Kemmis & Grootenboer, 2008; Kemmis et al., 2014; Mahon, Francisco, & Kemmis, 2017). The theory of practice architectures builds on Schatzki's (2001) concepts of practice and the critical insights of Habermas (1974) and assumes that social reality consists of a variety of practices that we daily, without further reflection, engage in and take for granted. A practice, according to the theory, is understood "as a socially established cooperative human activity involving utterances and forms of understanding (sayings), modes of action (doings), and ways in which people relate to one another and the world (relatings) that 'hang together' in characteristic ways in a distinctive 'project'" (Mahon, Francisco, & Kemmis, 2017, p. 7). Instructional videos can be comprehended as conditions, 'practice architectures', which are intended to re-shape trainee's and employees practices at the workplace, so they can (learn to) practise differently. Instructional videos can also be designed to be 'teaching practices' intended to supplement or replace traditional workplace training such as for example cashier and customer service training. When viewed by a trainee or learner, the instructional video become part of 'pedagogical practices'. This study builds on the latter understanding, viewing instructional videos as pedagogical practices.



Figure 1: Instructional video practices are composed of sayings, doings and relatings that hang together in a project. (developed by author from Mahon, Francisco, Kemmis, & Lloyd, 2017, p. 11)

The storyline in the instructional videos for cashier work is communicated by practitioners, that is, a narrator and or actors, representing cashier (also sales assistant, clerk, teller) practices situated in checkouts (Fig. 1). The videos show what to say (sayings), what to do (doings) and how to relate (relatings) to colleagues, customers and company, and to objects such as the cash register and POS systems. The project or purpose with the instructional video practices is to teach and mediate expected characteristics of the cashier profession and cashier practices. Analytically, the theory of practice architectures sees practices as existing in three dimensions (Fig. 2). The participants' (narrator, actors) 'sayings' and thinking, are realised through language in the semantic dimension, "semantic space", and evident in their cognitive understandings. In the instructional videos for cashiers' work, the vocabulary used demonstrating interactions with customers or POS systems are examples of the vocational language characterising cashier practices. The participants' 'doings' are realised through activity and work in the physical dimension, "physical space-time", and evident in their skills and capabilities. For example, in the videos, skilled cashiers demonstrate the right methods for handling money and situations in cashier practices. The participants' 'relatings' are realised in the social dimension, "social space", and are evident in their values, feelings and emotions. In the instructional videos, relatings can emerge as demonstrations of the right cashier values such as what it means to be friendly.

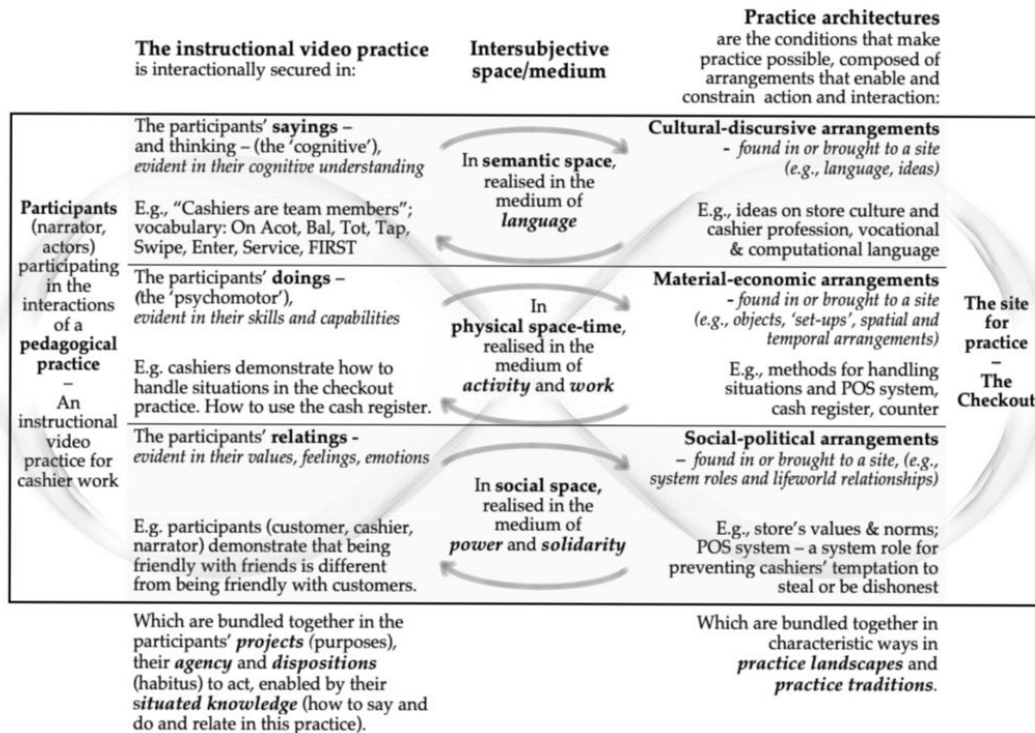


Figure 2: Theory of practice architectures, theoretical lens and analytical tool for exploring instructional video practices for cashier work, adopted from Kemmis, S (February 18, 2020) personal communication.

In reality, however, the sayings, doings and relatings in a practice are not separable. They are bundled together in the happening-ness of the practice, and guided by the participants' projects, that is, the purpose of the cashier practice as demonstrated in the instructional videos. The videos also aim to show the kinds of agency cashiers make evident in their practice, and their dispositions to act in the ways they do as they enact the cashier practice. The participants' projects, agency and dispositions are enabled by their situated knowledge (how to say and do and relate in the cashier practice). According to the theory of practice architectures, practitioners' 'sayings', 'doings' and 'relatings' in pedagogical practices are enabled and constrained – as, indeed, made possible – by the conditions present in the site of practice (or brought to the site by participants). Analytically, the practice architectures are composed of arrangements corresponding to the three dimensions of practices.

"Cultural-discursive arrangements" in instructional video practices prefigure and shape what the participants say and think in the semantic space of practice. For example, ideas on the cashier profession and how to organize the store, the business and work (part of the store culture) shape how cashiers, customers and narrators talk and what they say in the instructional videos. "Material-economic arrangements", prefigure and shape what the participants do in the physical space-time occupied by a practice. Of specific interest in this study is in what ways technology, information systems and methods over time have supported, constrained or changed cashier practices and cashiers' skills and capabilities. "Social-political arrangements" prefigure and shape how the participants relate to each other, the environment, and technology in social space of practice. The store's policies, values, norms (e.g. how to behave, attitudes, relate to customers) and system roles (cashier, courtesy clerk, customer, manager, company, POS system) are examples of social-political arrangements shaping, enabling and constraining cashier practices. In reality, the cultural, the material and the social are not separable; these three types of arrangements are bundled together into "practice landscapes" and "practice traditions". Analyzing instructional video practices for cashier work produced during a larger time span (1917-2019) allows the researcher to highlight and describe not only the practice traditions of cashier practices but also instructional videos as pedagogical practices in work and workplace training.

As has been shown, the theory of practice architectures allows this researcher to gain knowledge of how instructional video practices for cashier work and how cashiers' skills and agency have changed over time. It also offers the possibility to understand and describe how the evolution of technologies is part of or connected to changes in cashiers' work practices. The findings of the analysis of instructional video practices for cashier

work have the potential to give directions for development of pedagogical practices such as workplace education, vocational education and instructional videos for work at increasingly connected workplaces.

Instructional videos

Instructional videos, as understood in the context of this study, involves different types of videos such as:

- **Training videos:** Training is the act, process, or method of one that trains. Training videos are designed to improve an employee's workplace skills and qualifications by teaching or instructing a specific content. They can also be designed to develop a trainee's or new employee's work skills and knowledge. Commonly, companies create training videos to cover interpersonal topics, such as service, compliance and harassment training, or job-related topics, such as hardware and software training. Training videos can be interactive and often use footage of real people to connect the trainer and trainee.
- **Tutorial videos:** A tutorial can be a paper, book, film, or computer program that provides practical information about a specific subject. The tutorial video is a "go-to" instructional method for teaching a work process or providing step-by-step instructions. They may leverage multiple instructional methods and are sometimes referred to as "how-to" videos, such as "how to scan" or "how to cashier work".
- **Screencast videos:** Digital video recordings of the computer screen that usually include audio narration. Screencasts tend to be short and informal (1 min-5 min), and the format lends itself to just-in-time teaching. For example, an instructor, colleague, or manager can quickly create a screencast to answer a question or clear up a challenging concept.

Methodology

In this study, public instructional videos for cashier work produced between 1917 and 2019 and uploaded to YouTube are used as empirical material to answer the research questions. While it is possible to find written documentation from ledgers from the early 1900s onwards concerning the introduction of cash registers and point of sale (POS) systems in stores, this early documentation did not record information about how work-based training for cashier work has been arranged over time (Crandall, 1997; Spellman, 2016). In addition, research on the consequences of the evolution of retail technologies has largely focused on the retailers, customers and marketing (e.g. Basker, 2016; Hagberg, Sundström, & Egels-Zanden, 2014; Hopping, 2000; Spellman, 2016). However, the increased availability and use of the Internet and digital technology have led to vocational educators, retail organisations along with innovators and vendors of retail technology publish instructional videos on YouTube to be viewed by existing and future employees or customers. During the 2010s, organisations and individuals interested in the history of retail have converted and increasingly published instructional videos on YouTube that were produced before the 2000s. YouTube can thus be considered a valuable online site for an empirical study of the relationship between technology evolution, the development of work-based training for cashier work and the formation of the sales assistant profession over time.

Video Methods

Online video ethnography research is an umbrella term for a growing research field where the main data material consists of videos or other visual data that have been collected from online sources (Legewie & Nassauer, 2018). Video recordings and analysis are increasingly used in educational, social and organisational science to replace or supplement observational studies and retrospective studies such as interviews and surveys (Lebaron, Jarzabkowski, Pratt, & Fetzer, 2018; Legewie & Nassauer, 2018). Video method enables dynamic audio-visual data that give a richer description of a practice or organisation compared to other qualitative methods (Lebaron et al., 2018). Video methods can help answer questions such as:

- How do sales assistants use mobile point of sale systems in the personal customer meeting?
- What is the role of technology in work-based training and learning?

Lebaron et al. (2018) describe that video methods have similarities with participatory observations in ethnography when studying an organisation or group such as the employees at workplace. It has also kinship with photographic methods, that are used in all of the three studies in the dissertation. Photographic methods emphasize the visual and perspectival aspects of organisations (Meyer, Höllerer, Jancsary, & van Leeuwen, 2013).

Searching for and selecting instructional videos

The author of this paper searched for instructional videos for cashier training using Google's search engine displaying search hits with Safari as the web browser. The initial criteria for the search process were that the videos would: a) Involve interaction with cash registers or POS systems; b) Be produced for educational purposes; c) Be available to the public; d) Provide information about publishers and marketing year; and e) Be connected to work-based training for sales assistants. The following search words were used in different

combinations: retail; checkout; cash desk; work-based training; tutorials; cashier; sales assistant; clerk; teller; checker; salespersons; cash register; POS; and mobile POS. The first search (2018-06-07) was conducted with the aim of finding instructional videos involving cash registers and POS systems. However, the search terms emerged to be too general. For example, POS training generated 767 000 hits and cash register training 1 290 000. To narrow down the number of hits, the search words retail, training, sales assistant or cashier were added. However, the search hits on Google still remained very high (1900 to 1 290 000 hits), therefore, the search terms were combined with decades.

Another problem that arose in the effort to do a systematic search for instructional videos was that the search differed over time and could not be repeated. This can be explained by the fact that videos are continually uploaded, removed or renamed on YouTube. The phrase “cash register training” was the only combination where the search hits decreased between June 2018 (1 290 000 hits) and December 2019 (783 000 hits). In total, the least number of hits for instructional videos for cashier work were generated in the timespan 1970s to early in the 2000s. While it was difficult to find instructional videos for cashier work it also emerged that the concept “customer service” was increasingly used in the retrieved videos from the 1970s onwards. Therefore, “customer service” was added as a search term with the intention to find more instructional videos for cashier work produced between the 1970s and 2000s. This also meant that the videos had to be viewed in their entirety to determine if they involved cashier work or interaction with PC POS systems.

Another discovery was that there were significantly more search hits for “sales assistant” than for “cashier” and other denominations for work in the checkout. One explanation for this can be that sales assistant is a term used more widely, another is that cashier due to automatization of checkout activities receive less training in the 2000s, hence the need for instructional videos for cashier work is small (Andrews, 2014). Henceforth, in this study we refer to all staff working at the checkout, despite other denominations in the videos, as cashiers. It is important to be aware, however, that cashier work often is one of many tasks in sales assistants’ work practices in retail stores. The final data material (see Tab. 1) consisted of 50 instructional videos. The videos, targeting a variety of industries and professions, were produced by retail chains, technology vendors, employment agencies, universities and vocational training providers.

Table 1: The empirical data material – Instructional videos for cashier work

Period	Number	Country
1910s - 1920s	2	US, SE
1930s - 1940s	3	US, SE
1950s - 1960s	8	US, GB, SE
1970s	3	US
1980s	2	US
1990s	2	US
2000s	3	US, NZ
2010s	27	US, GB, SE, NZ, IN, DE

Ethical considerations

Bringing digitalisation in social practices into focus for research also brings new ethical issues to handle when producing and analyzing data (GDPR, 2018). For example, how to handle personal information, published online as texts, photos, images and videos. Personal information is, according to the GDPR legislation, any information that can be directly or indirectly linked to a person who is alive. Typical personal information is a personal identification number, credit card, email address, name and address. The ethical concerns that apply for off-line research, such as for instance, informed consent, privacy, transparency, and minimizing harm, holds for online research as well (Legewie & Nassauer, 2018). Therefore, the ethical considerations were brought into focus before, during and after the empirical process following the requirements present in both international guidelines and the ethical guidelines of the Swedish Ethical Review Act (SFS, 2003:460).

The underlying notion, according to Legewie and Nassauer (2018), is that data available online does not give researchers free rein in its use. The online context in which the data has been posted, the total number of views, the purpose of the post or video should impact the assessment of confidentiality and contextual integrity. Therefore, the selection of videos for this study is based on the following criteria: they are public, accessible on YouTube, with many views, and published with an educational or informative purpose. However, it turned out to be a difficult and time-consuming process to find, get in contact, and get written consent from the producers

of the instructional videos. Only five producers in total responded and accepted our request, in some cases after a year. On the other hand, following Legewie's and Nassauer's (2018) ethical recommendations, the videos are public on YouTube with an educational or informative purpose. To open up for a discussion concerning the findings, we have therefore chosen to connect quotations to the title and production year/period of the video. Photos illustrating situations from instructional videos produced before the 1970s have been assessed not to cause harm for the participants, while photos from more recent instructional videos are presented as sketches in the findings. The app Procreate and an iPad Pro enabled for example to remove background that was not of interest for the situation and to change the shape, skin, hair, and clothes of participants on the photo. Digital drawing compared with computer-manipulated photos generate more vivid images while keeping the privacy of the participants.

Analysis process

- 1 The analysis process was initiated by viewing the chosen 50 instructional videos 2-3 times focusing on what was "happening" in the videos (Nicolini, 2012). In this step: type of instructional video (training, tutorial, screencast), title, production year, a short summary of the storyline, technology involved, URL, and number of views were documented. In parallel, a literature study was conducted to connect the instructional videos to the evolution of retail technology (POS, RMS, CRM systems).
- 2 For this study, 27 of the 50 instructional videos were selected so as to represent the time span of the videos (1917-2019) in order to capture the technological changes and how such changes are addressed in the instructional videos in terms of what skills are stressed, the purpose of cashier practices and cashiers' agency. The videos were watched in sequences iteratively on YouTube or in iMovie. The verbal dialogues
- 3 As already discussed, the theory of practice architectures provided analytical tools for exploring the instructional videos as part of pedagogical practices in workplace education. The data (transcripts, video sequences, snapshots) about cashiers' practices was analytically separated into 'sayings' (ideas on organization of the store, work, cashier profession), 'doings' (skills and capabilities), and 'relatings' (values, feelings, emotions) (Tab. 2).



Title:	1945 - You Can Tell by the Teller, 18.42 min
URL	https://youtu.be/TbdCIADAJw0
'Sayings' In semantic space	
<p>"stub and bill"; "arranging her tools in the most convenient positions"; "To learn the correct ways of"; "with a ready smile"; "Establish a personal relationship"; "maintain good overtones"; "to learn the correct way to do each item, lets follow a <u>skillful</u> girl as she does her job pleasantly and effectively"</p>	
'Doings' In physical space-time	
<p>Do's and Don'ts - video describe and demonstrates the right and wrong actions for handling money, equipment and situations. 12 steps to master in customer interaction: 1. Greet customer. 2. Receive bill and money. 3. Separate stub from bill. 4. Verify with customer money received and amount to be paid. 5. Stamp stub and bill. 6. Make correct change. 7. Place change in customer's hand. 8. Hand customer receipt, noting name. 9. Thank customer by name. 10. File the receipted stub. 11. Place money in cash box. 12. Be alert to greet next customer.</p>	
'Relatings' In social space	
<p>"We met her for only a few seconds, but that was time enough for her to impress us with her friendliness, ability and accuracy. She made us feel good toward herself and her company"; "The actual mechanics of taking the money, stamping the receipt, and returning the change can be done as effortlessly as a hostess serving her guests, and like her, you can make that act seem personal to the one you are serving"</p>	

Table 2. Excerpt from an analyze table of an instructional video from 1945

- 4 The fourth step in the analysis process was to zoom out of the video practices by analysing the practice architectures prefiguring and shaping them. That is, the researcher examined how cultural-discursive arrangements shaped the sayings of the cashier-practices being demonstrated, including ideas on how to organize the store, the checkout and work, and ideas on the cashier profession. This allowed the researchers to reach initial findings about the discourses that shape the vocabulary ('sayings') expressed in the videos. The researcher also examined how material-economic arrangements shaped the doings of the cashier-practices being demonstrated, including such things as how methods, technology and information systems enable or constrain the activities ('doings') in the videos. Furthermore, the researcher examined how social-political arrangements shaped the relatings of the cashier-practices being demonstrated, including such things as how norms and values enable and/or constrain the relationships visible in the instructional video practices. Of specific interest was to explore technology and information systems as cultural-discursive, material-economic and social-political arrangements in the cashier practices demonstrated in the videos.
- 5 In the final step, the researcher moved between zooming in and zooming out to explore the practice traditions, and cashiers' projects, agency, dispositions and situated knowledge as manifested in the instructional video practices (Kemmis et al., 2014, p 27). That is, we looked for relationships between the evolution of technologies and the corresponding evolution of cashiers' work practices, and what these changes indicated about the expected practices and projects of cashiers, and their expected sense of agency, their expected dispositions, and their situated knowledge

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