Anna-Maija Multas

NEW HEALTH INFORMATION LITERACIES
A NEXUS ANALYTICAL STUDY
ANNA-MAIJA MULTAS

NEW HEALTH INFORMATION LITERACIES
A nexus analytical study

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Abstract

New technologies transform our everyday environments, enabling the formation of new information practices that involve multimodal content and its creation. These developments also challenge conceptions of literacies related to health and well-being. This thesis aims at increasing our understanding of new health information literacies as a sociocultural phenomenon to provide novel knowledge of the variety of health information practices enacted in people’s everyday social environments.

The theoretical-methodological perspective of this thesis is nexus analysis and the research was carried out in two phases. Phase 1 involved reviewing the current health literacy research in online contexts to reflect on contemporary academic discourses and practices. Phase 2 entailed considering the gaps identified in phase 1 and investigating the everyday discourses and health information literacy practices of young people in a social media environment. In phase 1, current research literature on health literacies in online contexts was systematically reviewed to synthesize health literacy concepts, definitions, their operationalization and approach to information. In phase 2, interviews, video diaries and YouTube videos of three video bloggers were qualitatively analysed.

The findings imply a need for conceptual and empirical development of health information literacies research in online environments. Phase 1 revealed that the ways new technologies transform our social practices or the multimodality of informational content online are not considered in current health literacies research. This was emphasized by the findings of phase 2: interconnected social, material and embodied health information literacy practices enabled information creation on social media. Specifically, information practices and authorities invested in them were constructed and enacted through embodied knowledge and authenticity of the presentation of health information and of the self.

These findings improve our understanding of information creation as part of transforming social practices in our everyday lives in a digitalized society. The findings may also benefit health promotion or education and information literacy instruction, specifically if the aim is to consider information practices relevant in everyday life.

*Keywords:* health information literacy, health literacy, information creation, information literacy, new literacies, nexus analysis, online environments, social media, video blogging, YouTube
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Tiivistelmä

Uudet teknologiat muovaavat arkielämän ympäristöjämme ja mahdollistavat uudenlaisten, multimoodaalisen sisällön tuottamiseen liittyvien informaatiokäytänteiden kehittymisen. Nämä muutokset myös haastavat käsityksemme terveyteen ja hyvinvointiin kytkevistä lukutaidoista. Tämän väitöskirjan tavoitteena on lisätä ymmärrystä uusista terveydenpekkojaossakaikkeinettä, tarjota uutta tutkimustietoa arkielämämme terveystietoon liittyvistä käytänteistä.


Tulokset osoittavat, että verkkoympäristöihin keskittyneen terveyden lukutaidon tutkimuksen on kehitettävä sekä käsitteellisesti että eri laajentumisella. Ensimmäisen vaiheen tulosten perusteella terveyden lukutaidon tutkimuksessa ei tällä hetkellä huomioita verkkoympäristöjen multimoosaalisia sisältöjä tai uusien teknologiojen vaikutuksia sosiaalisissa käytänteissä. Toisen vaiheen tuloksissa kerättyjen tulosten perusteella se terveyden ja koulutuksen käytänteet ovat keskeisiä elementtejä sosiaalisen median informaatiokäytänteissä sekä auktoriteetien rakentamisessa.

Tutkimus tuottaa uutta ymmärrystä informaation luomisesta osana digitaalisoituneen arkelemaa muutuvia sosiaalisia käytänteitä. Tulokset ovat hyödynnettäviä myös terveyden edistämisen sekä terveyden ja informaatiolukutaidon opetuksen kehittämisessä, erityisesti sillä, että tavoitteena on huomioinut arjessa olennaiset informaatiokäytänteet.

Asiakirjat:
informaatiolukutaito, informaation luominen, neksusanalyysi, sosiaalinen media, terveyden lukutaito, terveystiedon lukutaito, uudet lukutaidot, verkkoympäristöt, videobloggaus, YouTube
Hillalle, Inarille ja Islalle
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In Oulu, January 2022

Anna-Maija Multas
### Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
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<tr>
<td>ACRL</td>
<td>Association of College &amp; Research Libraries</td>
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<tr>
<td>eHealth</td>
<td>electronic health</td>
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<tr>
<td>eHEALS</td>
<td>eHealth Literacy Scale</td>
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<tr>
<td>EHIL</td>
<td>Everyday Health Information Literacy</td>
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<tr>
<td>FCCHL</td>
<td>Functional Communicative and Critical Health Literacy scale</td>
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<tr>
<td>ICT</td>
<td>information and communication technology</td>
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<tr>
<td>MLA</td>
<td>Medical Library Association</td>
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<tr>
<td>PRISMA</td>
<td>Preferred Reporting Items for Systematic Reviews and Meta Analyses</td>
</tr>
<tr>
<td>REALM</td>
<td>Rapid Estimate of Adult Literacy in Medicine</td>
</tr>
<tr>
<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organization</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
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List of original publications

This thesis is based on the following publications, which are referred to throughout the text by their Roman numerals. Article I is reprinted with permission from Springer. Original publications are not included in the electronic version of the dissertation.


Description of the author's role in the original articles

In all sub-studies, as the first author (formerly Huhta), I was responsible for the overall research design, data gathering and analysis and writing of the articles. The co-authors and supervisors of my thesis, assistant professor Noora Hirvonen (Studies I–IV) and professor Maija-Leena Huotari (Studies I and II) provided their expertise and insights throughout the research process and contributed to writing and/or editing the papers.

In Studies I and II, I outlined the search strategy, conducted the data searches, selection and analysis. In Study II, as the second author, assistant professor Noora Hirvonen conducted a screening of a 10% random sample of the selected review articles to ensure agreement on the study selection. Together with my co-authors we edited the paper to prepare it for publication.
In Study III, as the first author, I conducted data gathering and analysis. Assistant professor Noora Hirvonen contributed by writing the theoretical background. As a joint effort with her, we outlined the overall study design and discussed, commented on, wrote and edited the paper for publication.

In Study IV, as the first author, I was responsible for the overall writing of the paper, including outlining the research questions and theoretical background, conducting data collection and analysis, and interpreting the findings. Assistant professor Noora Hirvonen provided her expertise throughout the writing process and especially contributed to outlining the discussion part and editing the paper as a whole. Professor Maija-Leena Huotari contributed by commenting on the paper and its overall structure.
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1 Introduction

1.1 Background

Emerging information and communication technologies (ICTs) have transformed and continue transforming our everyday information environments. These technologies have enabled the formation of new kinds of information practices. For example, information creation, with the volume and magnitude that it takes place in contemporary online contexts, such as social media, was not possible only a few years ago. These changes within our everyday environments also, and specifically, apply to information practices related to health and well-being. Online environments, and especially social media, have become central places to spend leisure time, communicate with and seek support from peers and express ourselves, for example, through content creation (see e.g. Balleys et al., 2020; Chen & Wang, 2021; Goodyear et al., 2019). In addition, for many, the Web has become the starting point for health information seeking (see e.g. Chen & Wang, 2021; Hesse et al., 2010; Jacobs et al., 2017). However, the quality and credibility of online health information are highly debatable (see e.g. Daraz et al., 2019). This has been the case especially during the ongoing COVID-19 pandemic that drove the world into an infodemic – an outbreak of misinformation spreading on the platforms of traditional and new media (see e.g. Duro dolu & Ibenne, 2020; Eysenbach, 2020; Zarocostas, 2020). Within this infodemic, people are argued to be in desperate need of critical thinking skills and abilities to evaluate the credibility and quality of the retrieved information, to mitigate the effects of information overload, and handle the variety of information online, including misinformation (see e.g. Koltay, 2017).

The new technologies and practices embedded in them have challenged the traditional conception of what a ‘literate’ person is. In addition to reading and writing skills, people enact various information practices related to finding, sharing, assessing, using and creating multimodal content online. Within medical and health sciences research, competencies and skills related to information seeking and use in health contexts are typically conceptualized as health literacy. However, this research has traditionally been centralized around a perspective describing health literacy as a tool for healthcare services and benefitting public health (see e.g. Chinn, 2011; Guzys et al., 2015; Mancuso, 2009; Mårtensson & Hensig, 2012; Pleasant & Kuruvilla, 2008) or focused on understanding health as an absence of disease (see e.g. Quennerstedt, 2010, 2018). Moreover, the most often used
definitions of health literacy have focused on the behavioural and cognitive perspectives of literacy, describing individuals’ skills and abilities to understand health information obtained, for example, from health professionals (see e.g. Chinn, 2011; Guzys et al., 2015; Lloyd et al., 2014; Mårtensson & Hensig, 2012; Ratzan & Parker, 2000). It has been argued that this viewpoint lacks the social and contextual essence of different literacies as transforming practices in everyday life contexts (see Lloyd et al., 2014; Papen, 2009; Samerski, 2019). Therefore, further research is needed to understand health literacies as social practices of people seeking, sharing, evaluating, using and creating multimodal health information online so as to better reflect the contemporary digital environment.

This thesis takes a sociocultural perspective to study information literacies related to health and well-being, referred to hereinafter as health information literacies. By drawing on information literacy research and the new literacies studies, the thesis aims to examine new ways of understanding health information literacies as a sociocultural phenomenon.

In the field of information studies, the term information literacy originally referred to techniques and skills for utilizing information sources to solve problems (see e.g. Zurkowski, 1974). More recently, a sociocultural perspective has emerged that regards information literacies as socially enacted practices (see e.g. Lloyd, 2010a, 2010b, 2011). Drawing on Lloyd’s (2017) recent definition, in this thesis information literacy is regarded as ‘a way of knowing’ (p. 94) – that is, a practice composed of activities and skills relevant to a certain context that are enacted in a social setting. This socially oriented approach regards information literacy as embedded in social practices, rather than as individual skills (see e.g. Addison & Meyers, 2013; Hicks, 2018, 2020; Limberg et al., 2012; Lupton & Bruce, 2010). The plural form, information literacies, is used when emphasising that information literacy practices vary situationally (see e.g. Haider & Sundin, 2022; Limberg et al., 2012; Sundin, 2020). Altogether, information literacy research has been profoundly connected to learning, and multitudinous studies have focused on educational and library contexts. Competencies and strategies related to information seeking, evaluation and creation have been taken into account in educational policy guidelines and recommendations. For instance, the Association of College & Research Libraries’ (ACRL, 2015) Framework for Information Literacy for Higher

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1 In this thesis, the term health literacies refers to the various concepts related to health and well-being emergent especially within medical and health sciences that describe the competencies needed to make use of health information.
Education emphasizes information creation and recognition of authoritative voices as part of comprehensive information literacy competencies and practices.

The new literacies perspective, which has emerged within educational sciences and social linguistics, broadens the traditional conceptualization of literacy by addressing ‘the new skills, strategies, dispositions, and social practices that are required by new technologies for information and communication’ (Coiro et al., 2008, p. 14). This thesis draws from this definition, which emphasizes the ways new information and communication technologies contribute to the emergence of new social practices. Compared to conventional literacies, often seen as individual and author-centric, new literacies, for example, stress the ways new technologies can promote the creation of digital content, often in multimodal forms, and require more participatory, collaborative and distributed management of information (Lankshear & Knobel, 2011). Within this perspective, texts are seen as consisting of multimodal forms that can arrive via digital code, such as sound, text, images, video, animations and combinations of these (Kress, 2003; Lankshear & Knobel, 2011). Similar to information literacy research, the new literacies research focuses on educational contexts. However, it should be noted that the addressed competencies and practices are essential not only in educational contexts but also in people’s varied everyday information environments, including social media.

This thesis investigates health information literacies with a particular focus on online information environments, understood here as a crucial part of people’s everyday social and physical environments and the practices related to them (see e.g. Shove et al., 2012). In the online contexts, such as social media, people often have an active role not only as consumers but as creators of information. Therefore, this thesis gives particular attention to information creation, understood as ‘the way people create messages, cues, and informative content that can be used to meet the existing or potential information needs of the creator or other users’ regardless of the format of this content (Koh, 2013, p. 1827). Within information literacy research, information creation has yet to be fully acknowledged as a part of information literacies (Hicks, 2020; Huvila et al., 2020; Kitzie, 2019). However, information practices, such as remixing, visualizing and presenting information, can be considered crucial aspects of information literacy competencies in our everyday information environments (see e.g. Hicks, 2020; Koh, 2013). Therefore, in addition to its broader aim of understanding health information literacies, this thesis aims to provide novel insights on information creation as an under-researched area in information studies by investigating how young people enact information literacy practices in the process of creating information on social media.
In doing so, it fills in an important research gap emergent within both the health literacy and information literacy research.

1.2 Aim and objectives

This thesis aims to increase the understanding of new health information literacies as a sociocultural phenomenon. The purpose is to study health information literacies as theoretical constructions and as practices enacted in everyday online information environments. This is done by employing nexus analysis as the theoretical-methodological perspective in two phases: First, by reviewing the current health literacy research in the context of online information environments to reflect current academic discourses and practices (phase 1) and, second, by considering the gaps identified in the first phase and investigating the everyday discourses and health information literacy practices of young video bloggers in a social media environment (phase 2).

The research questions are as follows:

1. How have health literacies been researched in online environments?
   a) How have health literacies been defined and operationalized?
   b) How does this research approach information?

2. What kinds of health information literacy practices are enacted by young video bloggers when they create information on social media?

3. What kinds of insights can these findings provide into understanding new health information literacies?
1.3 Overview of the articles and structure of the thesis

This thesis is based on four original articles referred to as Studies I, II (phase 1), III and IV (phase 2).

Study I systematically reviews the different health literacy concepts that have been used in previous empirical research on online information environments. The study specifically emphasizes the ways in which this research has approached information. According to the findings, most of this research has been quantitative and conducted within medical or health sciences. The findings suggest that several concepts have been used in these studies across disciplinary boundaries, and there is no clear consensus on the definitions of these concepts. The role of information within the definitions varies, but health information has often been portrayed as general information obtained through information seeking. Within some health literacy definitions, information has been understood holistically; information and knowledge have been gained not only through information seeking but also from prior experience. The definition of health information literacy emphasizes the information-seeking process and especially individuals’ ability to identify information needs and sources and critically assess the relevance of the retrieved information. These aspects are usually ignored in other health literacy definitions. However, the definitions of health information literacy, along with other health
literacy definitions, do not acknowledge socio-cultural aspects of literacies as socially enacted practices.

Study II, based on the same material used in Study I, focuses on the definitions of health literacy concepts and their operationalization in studies conducted in online information environments. Based on the different definitions of health literacies, three thematic categories are identified: health literacy as (1) a general skill, (2) a multidimensional concept and (3) as a domain-specific concept. The findings suggest that there is a tendency to refer to early definitions of these concepts presenting a functional understanding of them. Moreover, these studies tend to adopt a domain-specific or general and skills-based health literacy definition over a multidimensional one. This is also reflected in the operationalization of the concepts: measurement has usually involved reading comprehension measures (general health literacy), self-efficacy measures (domain-specific health literacy) or a combination of several types of measures (multidimensional health literacy). However, there are clear inconsistencies in operationalization, especially of the multidimensional concepts. The review indicates that conceptual development of health literacy is warranted, and researchers are encouraged to provide a clear description of the operationalization of the concepts they use to ensure transparency in reporting.

Study III contributes to building the theoretical-methodological approach and positioning of this thesis by investigating the potential of nexus analysis for studying information literacy. It focuses on developing a way to examine the linkages between discourse and action in information literacy research. Nexus analysis is discussed in relation to other socially oriented approaches to information literacy research – namely, practice and sociocultural theories and discourse analysis. An empirical example, including data triangulation, of the information literacy practices of a young video blogger is used to explain the key ideas and concepts of nexus analysis. The findings of the study indicate that whereas other socially oriented literacy approaches tend to examine either the practices of fixed social groups or language use, nexus analysis focuses first on social action, investigating how discourses are manifested in action. Moreover, the study addresses some of the research gaps identified in Studies I and II by including a qualitative examination of health information practices, especially focusing on information creation, an aspect of literacies which is highly relevant in online contexts but is disregarded in health literacy research in general.

Study IV examines the information literacy practices of young video bloggers creating a health-related video on YouTube, focusing on the under-research aspect
of information creation. In this study, the perspective of information literacy is employed to include a broader view on literacies as socially oriented practices, a perspective usually disregarded within health literacy research. Guided by nexus analysis, multimodal data consisting of YouTube videos, theme interviews and video diaries of three Finnish video bloggers are analysed in the study. The findings show that the video bloggers employ several health-related information literacy practices during the information-creation process, including information seeking, planning, organization, editing and presentation of information. In line with earlier information creation studies, practices of mixing and visualizing information emerged as well. The study can be seen to contribute to both the socially oriented information literacy research and health literacy research by offering new insight into examining information creation as a crucial part of literacy practices.

This thesis consists of six chapters. After this Introduction, in chapter 2, I present the theoretical background of this thesis and earlier studies to outline the key research on new literacies, information literacy and health literacy. In chapter 3, I present the research methodology including the science philosophical background and basis of nexus analysis as the methodological-theoretical perspective of this thesis. A summary of the key findings of phases 1 and 2 is presented in chapter 4. In chapter 5, I discuss the main findings and answer the research questions of the thesis. This chapter includes a discussion on the theoretical contribution, practical implications, evaluation of the methodology of this thesis and suggestions for future research. Finally, in chapter 6, I conclude the thesis by making my final remarks.
2 Theoretical background and earlier studies

Theoretically, this thesis is based on literacy research in the fields of educational sciences, information studies and health and medical sciences. Conceptualizations of literacies within these fields regard terms such as new literacies, information literacy and health literacy, all considered to give important insights towards fulfilling the aim of this thesis, understanding new health information literacies as a sociocultural phenomenon.

In the sub-chapters that follow, I will first shortly present the development of the term *literacy* in the educational context and its evolution into more sociocultural-oriented conceptualizations (sub-chapter 2.1), such as new literacies (sub-chapters 2.1.1 and 2.1.2). Then I will introduce the origins of the concept of information literacy (sub-chapter 2.2), sociocultural information literacy research (sub-chapter 2.2.1) and studies on information creation as an information literacy practice (sub-chapter 2.2.2). In sub-chapter 2.3, I present the basics of the health literacies research. This includes a description of what is meant by *health* and *health information* in general and in the context of this thesis (sub-chapter 2.3.1), and the concepts and common definitions of health literacy (sub-chapter 2.3.2), eHealth literacy (sub-chapter 2.3.3) and health information literacy (sub-chapter 2.3.4). Finally, I introduce some of the empirical research on health literacies to date (sub-chapter 2.3.5) and summarize these sub-chapters for the reader’s convenience (sub-chapter 2.4).

2.1 Literacy as a sociocultural practice

The term ‘literacy’ was set as the key concept of contemporary educational theory and research in the English-speaking world in the 1970s (Lankshear & Knobel, 2003; Williams, 1983). In the United States at this time, functional ‘illiteracy’ was found to be a major problem among the adult population (see e.g. Rosenthal, 1970). This led to the development of national policy programs in the United States and other Western countries to ensure that the adults could read and write at a level needed to manage the texts they deal with on an everyday basis (Lankshear & Knobel, 2011). Street and Lefstein (2007) noted that today, in many academic circles, enhancing adult literacy is still seen as a solution to solve population illiteracy. Similarly, the term ‘literacy’ tends to refer to ‘reading’ and particularly to young children’s learning of reading (Street & Lefstein, 2007). Paulo Freire, a pioneer of the radical education movement, redirected this early understanding of
literacy as merely coding and decoding (see e.g. Gurak, 2001) alphabetical print towards a pedagogy emphasizing collaboratively pursued critical consciousness of the world through the process of reflection and action (Lankshear & Knobel, 2011). Freire (1970) saw literacy as a political tool to empower individuals. His concept of literacy as ‘reading the world and reading the word’ expresses the dual processes of understanding the text but also making sense of the world that the text is about (Freire, 1985, p. 15). Barton (2007) described Freire’s view on literacy as explicitly critical because it approaches literacy as a tool to empower but also to oppress. Freire’s work set the ground for literacy to become the focal concept of emergent sociocultural theory in educational sciences (Lankshear & Knobel, 2011).

According to Lankshear and Knobel (2011), during the 1980s and 1990s, the U.S. education system in particular moved towards a ‘standard-testing-accountability-performance’ model highlighting the accountability of certain levels of literacy and numeracy as curricula standards. At the same time, a more sociocultural approach to literacy within studies in language and social sciences was in development (see e.g. Gee, 1990; Street, 1984). Barton (2007) described this as a shift from a psychological paradigm to a social paradigm in literacy research. Central publications of this turn were the works of social psychologists Sylvia Scribner and Michael Cole (1981), who presented an alternative notion of literacy as a social practice. Within this view, literacy can only be understood in the context of the social practices in which it is enacted (Barton, 2007). This sociocultural perspective in educational research was widely influential on the social theories of learning, such as Lave and Wenger’s (1991) theorization of situated learning and peripheral participation and Street’s (1984) dichotomy of literacy approaches as autonomous and ideological models. The autonomous literacy models approach literacy as separate from the social context, which is contrary to the ideological understandings of literacy as context-specific and dependent on ideological underpinnings explicit and implicit in social practices (Barton, 2007; Street, 1984).

Along with the turn towards a sociocultural understanding of literacies, the 1980s brought about the fracturing of literacies into various subject literacies (see e.g. Bawden, 2001; Stordy, 2015). For example, along with the emergence of an ICT industry, conceptualizations of computer literacy were coined to encapsulate the competencies needed and skills related to using computers and software packages (Gillen & Barton, 2010; Stordy, 2015). As the internet and new digital tools for seeking, communicating and using information became embedded in the social actions of people in the 1990s, the conceptualizations of literacy transformed toward ‘softer’ skills and competencies required to cope with the growing amount
of information in the digital world (Stordy, 2015). For example, the concept of digital literacy was introduced in 1999 by Gilster in his book of the same name, and information literacy (for more, see sub-chapter 2.2) was promoted especially among academic librarians (Bawden, 2001; Gibson, 2007).

Given the topic of this thesis, the more recent developments within the sociocultural literacy research, such as the focus on everyday aspects of literacies and health issues, are of special interest. Barton (2007) emphasized how people use literacy – that is, how it is ‘tied up with the particular details of the situation and that literacy events are particular to a specific community at a specific point in history’ (p. 3). Literacy is embedded in our everyday activities and is enacted in numerous settings and through various different texts. With these ideas, Barton provided a distinct view of literacy outside the educational settings in which literacy is typically taught. Following the notion of literacies as everyday social practices that Barton and others have supported, Papen (2009) challenged the dominant conceptions of health literacy by highlighting the ‘contextual nature of reading and writing in health care settings’ (p. 19). According to Papen, health care environments are textually mediated social worlds shaped by authoritative relations. Moreover, health literacy is often based on shared knowledge and expertise and is, therefore, collectively achieved. For a detailed description of health literacies research, see sub-chapter 2.3.

2.1.1 New literacies research

Within educational research, the ‘digital turn’ drew attention to new literacy practices in digital environments in various contexts (Mills, 2010). Researchers that were involved in the movement called the New Literacy Studies, which emerged in educational research and sociolinguistics in the 1990s, argued that literacy is embedded in and develops out of the social practices of a culture (see e.g. Gee, 1990, 2012; Street, 1995). The new literacies studies have been described as a theoretical perspective on educational studies aimed at working against efforts to formalize the components of literacy practices as universal standards (Mills, 2016). An overlapping research agenda initiated by the New London Group (1996) coined these similar ideas of transforming literacies in a changing communications environment as multiliteracies2. The multiliteracies approach places a special focus

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2 For example, in the Finnish national core curriculum, multiliteracy is set as one of seven transversal competencies that students need in all spheres of life (Finnish National Board of Education, 2016).
on literacy pedagogy that takes into account the cultural and linguistic diversity of modern societies (New London Group, 1996). A unifying notion within all new literacies and multiliteracies theorizations is that literacies are socially mediated (see e.g. Black, 2005; Gee, 1999; Lewis & Fabos, 2005) and technological tools shape relationships and the practices of our societies and enable or disable certain kinds of literacy practices (Coiro et al., 2008).

Educational researchers Leu et al. (2015) argued that contemporary social practices are firmly embedded in digital technologies and, thus, the new literacies that are part of our everyday lives. Consequently, ‘new literacies include the new skills, strategies, dispositions, and social practices that are required by new technologies for information and communication’ (Coiro et al., 2008, p. 5). Moreover, assigning plurality to literacy draws attention from traditional, standardized models of literacy towards acknowledging that there are a variety of different literacies that ‘shift with contexts, texts, and the identities of people using literacy’ (Rowsell & Walsh, 2011, p. 55). Lankshear and Knobel (2011) described new literacies as transformed social phenomena that have emerged along with the rise of new ICTs, moving our understanding of literacy from print-based to literacies that deal with multimodal content in a digital environment. Texts are in multimodal forms that can arrive via digital code as sound, text, images, video, animations and combinations of these (Kress, 2003; Lankshear & Knobel, 2011). Moreover, new literacies are more participatory, collaborative and distributed than conventional literacies that can be seen, on the contrary, as individual and author-centric (Knobel & Lankshear, 2014). Gleason (2018) pointed out that digital technologies are socially mediated – that is, people experience with them and adapt them while using them, and in this respect, they influence and are influenced by new literacies. However, Lankshear and Knobel (2011) noted that not all new literacies are ‘new’, in the sense that they would possess both new ‘technical stuff’ and new ‘ethos stuff’ – that is, practices developed within and for the purposes of new ICTs. Within the new literacies research, the notion of practices is understood by following the central ideas of practice theory, referring to practices as the ‘smallest unit’ of social theory and often coined as socially recognized ways to generate, communicate and negotiate meanings (Reckwitz, 2002, pp. 245, 249).

Essentially, the core of new literacies research is investigating the ways people produce, distribute, share and negotiate meanings in transforming societies that are continually evolving due to technological changes (Knobel & Lankshear, 2014). In contrast to other literacy domains, new literacies focus on collaborative and participatory social practices and the creation of ‘informational things’ through, for
example, digital remixing, referring to mixing any type of digital artefacts (see e.g. Lankshear & Knobel, 2011). These types of peripheral cases of new literacies are seen to ‘confront established social structures and relationships’ as they are more inclusive, egalitarian and more responsive to human needs (Lankshear & Knobel, 2011, p. 86).

2.1.2 New literacies in everyday online environments

Empirical research on new literacies has focused on educational settings, such as teaching of new literacies (see e.g. DeSchryver & Yadav, 2015; Herring et al., 2015; Knobel & Kalman, 2016; Räisänen, 2015; Tafazoli, 2021) and students’ new literacy practices in formal learning settings (see e.g. Brown, 2016; West, 2019; Yeung & Curwood, 2015). However, as Tafazoli (2021) noted in her integrative review on new literacies related to teaching and teachers, in practice, these studies tend to focus on the term digital literacy instead of new literacies. Although there seems to be a slight overlap in the use of these terms in the contemporary literacy research, discussion on digital literacies at large is beyond the scope of this thesis.

Outside classroom contexts, research has focused on online literacy practices, such as digital writing and video production. Greenhow and Gleason (2012) and Gleason (2016, 2018a, 2018b) investigated the new literacies practices of teenage Twitter users. These studies conceptualized tweeting as a new literacy practice and used qualitative methods, such as discourse analysis, to investigate multimodal Twitter texts and interviews of Twitter users (Gleason, 2016, 2018a, 2018b; Greenhow & Gleason, 2012). The results indicate that young people used both traditional and emerging literacy practices when acting on Twitter, and they especially used the platform for self-expression, communication, friendship maintenance and information sharing (Gleason, 2016, 2018b). In a recent study, Shafirova et al. (2020) investigated identity building and new literacy practices on a fandom site using an ethnographic case study of a Russian fan crafting figurines of characters from a television show. The results suggest that the study participant was able to simultaneously build his identity as a crafter and a competent English language writer and develop new literacies by appropriating various linguistic, multimodal and technological resources (Shafirova et al., 2020). Bacalja (2020) examined writing in digital spaces as new literacy practices and how these practices may be taken into account in contemporary educational contexts. From the new literacies perspective, digital writing is often more fluid than fixed, interwoven through hyperlinks, collaborative, multi-vocal, multimodal and non-linear (Bacalja,
Moreover, digital texts are easily revised and updated, and text genres are fluid, hybridized and mutated (Bacalja, 2020).

### 2.2 Information literacy

The term *information literacy* as coined by Paul Zurkowski in 1974 aimed to describe work-related competencies to handle the growing amounts of information emergent along new computer technology (see e.g. Lloyd-Zantiotos, 2010). According to Zurkowski (1974), information literate individuals are ‘trained in the application of information sources […] they have learnt techniques and skills for utilizing a wide range of information resources as well as primary sources for molding information solutions to their problems’ (p. 6). Within the fields of information studies and educational sciences, information literacy is seen as profoundly connected to learning. Reviews of information literacy research have described the conceptualizations of information as falling into different thematic categories or perspectives (see e.g. Addison & Meyers, 2013; Sample, 2020; Tuominen et al., 2005). Addison and Meyers (2013) reviewed information literacy research and identified three perspectives on information literacy:

1. *acquisition of information age skills*
2. *cultivation of habits of mind*
3. *engagement in information-rich social practices*

The first perspective conceptualizes information literacy as ‘a set of discrete abilities or behaviours expressed by the users of digital information systems, often in the process of inquiry’ (Addison & Meyers, 2013). These skills are seen as fundamental especially due to the emergent information age, an era of human civilization defined by technological changes in the Western society (see e.g. Eisenberg et al., 2004). The roots of the skills approach, described also as the skills-based approach (Lloyd et al., 2014) or generic skills approach (Tuominen et al., 2005), are seen to trace back to the adoption of information literacy in the pedagogical context (Addison & Meyers, 2013). The skills perspective places emphasis on user behaviours in an information environment and the application and quantification of information literacy competencies (Addison & Meyers, 2013; Lloyd, 2017). Focusing on ‘creating a base-line’ for required information skills (Lloyd et al., 2014), the approach adopts an understating of information literacy according to which individuals can ‘recognize when information is needed and
have the ability to locate, evaluate and use the needed information’ (American Library Association, 1989, p. 2). This approach to information literacy is argued to be dominant especially within the education sector and among librarians and other information specialists (Addison & Meyers; Lloyd-Zantiotis, 2010; Sample, 2020).

The second perspective addresses information literacy as the development of habits of mind facilitating information work, referring to the ‘application of abstract mental models to activities involving information’ (Addison & Meyers, 2013). According to Sample (2020), this perspective tends to focus on mental processes regarding information processing, such as reflective thought and motivation. The idea behind this perspective is based on the transferability of skills from one context to another and the assessment of these competencies (Addison & Meyers, 2013; Sample, 2020). However, as Addison and Meyers (2013) pointed out, a key challenge with this perspective is that people are often poor at transferring and using these skills in different contexts and applying them to different problems.

The third perspective frames information literacy as ‘a set of practices involving tools and media that are deeply embedded in a particular context or activity’ (Addison & Meyers, 2013). Theoretically, studies adopting this perspective take a sociocultural view on literacies which emphasizes the relationship between individuals and various forms of collective practices (Limberg et al., 2012). According to Addison and Meyers (2013), the practice perspective on information literacy is closely linked to the multiliteracies and new literacies frameworks emergent in the educational sciences (see chapter 2.1.1). However, Addison and Meyers (2013) recognized both the possibilities and challenges of this perspective: as a more recent approach, the practice view defines information literacy not from an institutionalized perspective but as a new way of thinking about how people in their everyday contexts participate in the world. Yet assessing these practices is not impossible but, rather, challenging, which may make it appear too difficult to adopt within institutions and administrative contexts (Addison & Meyers, 2013). As this thesis adopts the sociocultural and practice perspective on information literacy, a more detailed description is presented next, in sub-chapter 2.2.1.

### 2.2.1 Sociocultural understanding of information literacy

The sociocultural perspective has gained ground not only within information literacy research but also within information studies in general (see e.g. Hartel, 2019). The sociocultural approach is a theory of learning and psychological
development based on the work of Vygotsky (1978) and developed further by Wertsch (1991). By emphasizing the relationship between individuals and various forms of social practices, the sociocultural perspective on information literacy focuses on the relation between action and cultural tools, both physical and linguistic, which are used to communicate within a specific practice (Limberg et al., 2012; Wertsch, 1998). It is seen to emphasize the ‘situatedness of information and its constructed outcome – knowledge, as socially bound phenomenon’ (Lloyd-Zantiotis, 2010, p. 46; Sundin, 2020). To stress this notion, sociocultural information literacy research often underlines the need to talk about literacies as plural phenomena (see e.g. Haider & Sundin, 2022; Limberg et al., 2012; Sundin, 2020). Moreover, information literacy is understood as ‘learning to communicate within a specific practice’, and the focus in research is placed on ‘tool-based information literacy practices within specific contexts and communities’ (Limberg et al., 2012, p. 116). Seminal works within the sociocultural and practice approaches to information literacy are by Lloyd and colleagues (see e.g. Lloyd, 2005, 2010a, 2011, 2017; Lloyd & Somerville, 2006; Lloyd-Zantiotis, 2010). In her earlier studies, Lloyd (2011) described how the sociocultural approach broadens the understanding of information literacy as practices and draws research attention towards understanding how:

- information is enabled and contested within a setting;
- the modalities (sources) are deemed credible and authoritative;
- information skills are operationalized (i.e. employed); and
- practices ‘go on’ in a particular setting.

Sociocultural information literacy research is often strengthened by connecting it with other social theories, such as practice theories (see e.g. Bourdieu, 1977; Schatzki, 2002; Shove et al., 2012) and the new literacies perspective (Hicks, 2018). Tuominen et al. (2005) were among the first to present the practice approach as a potential theoretical framework to shift the focus of information literacy research ‘away from the behavior, action, motives, and skills of monologic individuals’ (p. 339). According to Talja and Nyce (2015), in information studies, the central interest of practice theoretical studies has been the ways people come to possess something that can be called expertise – ‘embedded, embodied, intuitive, opportunity based, and self-sustained’ (p. 64) ways of acting in situations that become practices. Hicks (2018) highlighted that practice theory provides a broad and dynamic lens through which to explore information literacy as negotiated and shaped within a certain setting and how individuals make meaning in their
information landscapes (Lloyd, 2010a). The new literacies perspective (in more
detail, see 2.1.1), however, can alert the information literacy research to the need
to broaden the conceptions of literacy to go beyond basic information skills and
structures (Hicks, 2018) and take into account the ways the multimodality of
information and new ICTs transform traditional information practices (see e.g.
Lankshear & Knobel, 2011).

The emergence of sociocultural approaches has led to new attempts to define
information literacy. For instance, Lloyd (2017), drawing from both sociocultural
and practice approaches, described information literacy as ‘a way of knowing’, a
practice that is enacted in social settings and is composed of different activities and
skills ‘that reference structured and embodied knowledges and ways of knowing
relevant to the context’ (p. 94). Moreover, the latest Framework for Information
Literacy for Higher Education (ACRL, 2015) is seen to adopt the sociocultural
approach on information literacy (Hicks, 2018) to some extent, in contrast to the
previous guidelines that employed a competency standard approach. However,
Hicks (2018) argued that the ACRL framework fails in its attempt to fully employ
a sociocultural understanding of information literacy by positioning ‘all
disciplinary thinking as emerging from the same core and overarching information
literacy concepts rather than, as is the case with a sociocultural perspective,
recognizing the individuality and uniqueness of each discipline’ (p. 73).

Nevertheless, the ACRL (2015) framework does take a progressive approach
to information literacy by highlighting competencies needed in contemporary
digital information environments, such as information seeking and evaluation,
information creation and recognition of authoritative voices. Within the framework,
information creation is seen as a dynamic process that may result ‘in a range of
information formats and modes of delivery’ (ACRL, 2015). Information literacy
abilities related to information creation include, for example, recognizing the
information needs of the receiver of the information, understanding the evolving
information creation processes, assessing the usefulness of the information and
development of one’s own information creation processes (ACRL, 2015).

Authority within the framework is seen as constructed and contextual and different,
and sometimes, unusual authoritative voices can be recognized. Abilities related to
recognizing authoritative voices include self-awareness of one’s own possible
biases and worldview and constant self-evaluation to maintain an open mind when
facing conflicting perspectives (ACRL, 2015).

Empirically, information literacy research adopting the sociocultural and
practice approaches has focused on ways information literacy is enacted in different
communities, such as among patients (see e.g. Lloyd et al., 2014), serious leisure communities (see e.g. Lloyd & Olsson, 2018), students (see e.g. Schreiber, 2014), language learners (see e.g. Hicks, 2020) and academics (see e.g. Pilerot, 2016). The changing technologies and online environments have also shaped the information literacy research and attracted research interest towards issues of embodiment (see e.g. Lloyd, 2010b; Olsson, 2010a, 2010b) and information creation in general (see e.g. Kitzie, 2019; Huvila et al., 2020) and as part of information literacy practices (Hicks, 2020), for example. Lloyd (2010b) described embodiment or embodied knowledge as a corporeal modality of information literacy; the body serves as an important source of knowing and the activities associated with it are constituted in the practice of information literacy. According to Lloyd (2010b), from this perspective, ’the focus is turned towards understanding the enactment, performance and production of knowledge and how these activities take place or 'happen' as situated action within a collective practice’.

2.2.2 Information creation as information literacy practice

Although ACRL has taken into account the notion of information creation as part of information literacy practices, for example, the construct has not yet been fully acknowledged in information literacy research (Hicks, 2020; Huvila et al., 2020; Kitzie, 2019) and consequently lacks a clear definition. According to Hicks (2020), information creation is usually regarded as the use of information, a final product of information literacy or as a way to present content. Moreover, it is often viewed as synonymous or overlapping with information production and making, terms commonly used in the context of digital media production (see e.g. Koh, 2013). In empirical studies, information creation has been referred to, for example, as ‘making contributions to the information world’ (Koh, 2013, p. 1826), bringing information into existence (Trace, 2007) and documentation (Gorichanaz, 2017; McKenzie et al., 2014). Koh (2013) distinguished information creation as a unique concept and defined it as ‘the way people create messages, cues, and informative content that can be used to meet the existing or potential information needs of the creator or other users’, regardless of the format of this content (p. 1827). Therefore, from a broader perspective, information creation should be understood as a crucial part of information literacy competencies, including information practices, such as remixing, visualizing and presenting information (see e.g. Hicks, 2020; Koh, 2013).

The notion of information creation as part of literacy activities has emerged as a research interest in fields such as media education research and especially within
educational sciences and the new literacies research focusing on literacy practices emergent along with new ICTs (see sub-chapter 2.1.1). Within these fields, a common understanding of literacy practices relates to a broad understanding of texts, such as digital content, appearing in multimodal forms, including sound, text, images, video, animation or combinations of these (see e.g. Lankshear & Knobel, 2011). Social practices related to the production of these multimodal texts are understood to be contextual, transforming and emerging along with new ICTs (Coiro et al., 2008; Street, 2003).

2.3 Health literacies

2.3.1 Health and health information

The Constitution of the World Health Organization (WHO, 1948) defines health as ‘a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity’. The definition is widely known but criticized for being too absolute, as it seems to declare people with chronic diseases and disabilities as being definitely ill (Huber et al., 2011). Huber et al. (2011) proposed changing the emphasis of the definition to abilities to adapt and self-manage in the face of social, physical and emotional challenges. This suggestion addresses health as an active process in an individual’s life span, not a mere state of current elements of well-being, as stated in the WHO definition. According to the Finnish Institute for Health and Welfare (2016), well-being is a combination of three dimensions: health, material well-being and perceived well-being together with quality of life. This definition also stresses the individual’s own experiences and feelings as part of the constitution of well-being and is, in that sense, the most relevant point of departure for defining health in the context of this thesis.

In accordance with this broad definition of health, health information in this thesis refers to any information that relates to health, illness or well-being. According to Wilson (1983), people construct knowledge on the basis of their first-hand experience of the world or what they have learned second-hand from others. Moreover, following a sociocultural understanding, knowledge is not something a person possesses or does not possess but something people create and enact together (Burr, 2015). Knowledge is seen as being constructed when information has been given meaning and integrated into our understanding (see e.g. Bates, 2005). Reflecting these conceptualizations, health information can be seen as
consisting of both types of information – that is, one’s own first-hand embodied experience and information gained from different sources, such as family and friends or social media. Therefore, one’s own bodily experiences as well as information from an online discussion forum or YouTube are all discerned as health information. Health information serves as the basis for constructing health knowledge, which is always socially created and enacted.

To make decisions about health and well-being or learn about diseases or other health issues, people obtain health information from various sources. Along with the emergence of ICTs and digital media in our everyday lives, it could be argued that the majority of information seeking has shifted to these platforms. In the traditional media landscape, health information was more often obtained in direct contact with information sources, such as medical professionals or printed material (Beaunoyer et al., 2017). According to recent studies, the majority of U.S. and German adults use the internet as their primary source for health information (Directorate-General for Communication, 2014; National Cancer Institute, 2018). Similarly, young people are increasingly using the internet to find health information, which may serve as a supplementary information source along with interpersonal sources, as presented by Wartella et al. (2016). While the shift from traditional media landscapes to contemporary digital environments has challenged the management of information in all domains of human knowledge, it can be argued to have particular implications for communicating health information (Beaunoyer et al., 2017). Due to the rapid flow of information, information overload and the amount of misinformation spread online (see e.g. Koltay, 2017; Seymour et al., 2015), people seeking health information online arguably need to pay particular attention to the credibility and accuracy of the online health information sources.

### 2.3.2 Health literacy

The concept of health literacy is widely used to address literacy competencies in health settings. The term was first introduced in the 1970s following the discussion of health education as a social policy issue (Simonds, 1974). Like the basic conception of literacy (see sub-chapter 2.1), the early definitions of health literacy were built on understanding literacy as individuals’ reading comprehension, numeracy and writing skills (see e.g. American Medical Association, 1999). According to a widely used definition, health literacy is ‘the degree to which individuals have the capacity to obtain, process, and understand basic health
information and services needed to make appropriate health decisions’ (Ratzan & Parker, 2000, p. vi). However, more recent definitions represent health literacy as a multidimensional concept acknowledging the breadth of skills that interact with social and cultural contexts (Mårtensson & Hensig, 2012). These definitions describe health literacy as a concept that, for example, recognizes people’s different capacities to find, understand and use health information in addition to the life experiences that shape people’s willingness and confidence to do these tasks (Batterham et al., 2017). According to WHO (2021), health literacy ‘goes beyond a narrow concept of health education and individual behaviour-oriented communication, and addresses the environmental, political and social factors that determine health’. Moreover, health literacy is gained through effective health education, which is achieved ‘through methods that go beyond information diffusion and entail interaction, participation and critical analysis’ (WHO, 2021).

Evidently, although the concept of health literacy has been under development for three decades, there is a lack of consensus on the definition of this concept (Chinn, 2011; Guzys et al., 2015; McCormack et al., 2013; Pleasant & McKinney, 2011; Sørensen, 2019; Sørensen et al., 2012; Sykes et al., 2013). Previous reviews have shown that health literacy is understood as individuals’ functional skills, such as reading comprehension and numeracy (see e.g. Chinn, 2011; Mårtensson & Hensig, 2012). Furthermore, research on health literacy is predominantly conducted within health and medical sciences, although similar issues have been addressed in other fields, and related and sub-concepts have emerged (Frisch et al., 2012; Mancuso, 2009). Although the definitions of health literacy and related concepts have unique features, several overlapping attributes can be recognized (Batterham et al., 2017). For instance, distinctions between basic functional health literacy, communicative or interactive health literacy and critical health literacy have been debated (Sykes et al., 2013).

Health literacy has been described as an evolving concept (Nutbeam, 2008) which demands that the research related to it needs to develop as well (Rudd, 2015). According to Mårtensson and Hensig (2012), research on health literacy is highly heterogeneous, but two main approaches can be identified. Within the first approach, health literacy is expressed as a polarized phenomenon and usually focuses on the extremities of high and low health literacy levels. The second approach describes health literacy as a multidimensional concept representing a complex understanding of health literacy ‘acknowledging a breadth of skills in interaction with the social and cultural contexts’ (Mårtensson & Hensig, 2012, p. 151). Pleasant and Kuruvilla (2008) described these two approaches as ‘a tale of
two health literacies’ (p. 152): clinical and public health approaches to health literacy. Samerski (2019) noted that the concept has evolved from ‘functional skills to health competence’ and argued that the newer and broader definitions ‘make health literacy a precondition for empowerment not only in the medical system, but also in everyday life’ (p. 2).

Recent studies on health literacy and public health policy programmes employing the concept present both perspectives on health literacy. An example from the public health point of view is the Healthy People initiative promoted by the U.S. government. The decennially published initiative traditionally adopted Ratzan and Parker’s (2000) early definition of health literacy describing the functional skills of individuals. For the latest initiative, Healthy People 2030 (U.S. Department of Health and Human Services, 2020), a new multidimensional definition was proposed which divides the concept into personal health literacy and organizational health literacy. Personal health literacy is described as the degree to which individuals have the ‘ability to find, understand, and use information and services to inform health-related decisions and actions for themselves and others’. Organizational health literacy, however, describes the degree to which organizations enable individuals to acquire these abilities (U.S. Department of Health and Human Services, 2020). According to Healthy People 2030, these definitions emphasize people’s abilities to, firstly, use health information in contrast to merely understanding it, and secondly, to make ‘well-informed’ rather than just ‘appropriate’ health decisions. Moreover, by adopting the definition of organizational health literacy, the Healthy People initiative ‘acknowledges that personal health literacy is contextual and that producers of health information and services have a role in improving health literacy’ (U.S. Department of Health and Human Services, 2020). Although the two definitions, for instance, do not specify what is meant by using health information, the action-oriented approach can be seen as an improvement over the earlier definition used by the initiative.

In recent empirical studies, health literacy has been conceptualized as a multidimensional concept, describing it as the capacity to act (Rademakers & Heijmans, 2018), as knowledge construction (Nikolaidou & Bellander, 2020) and as a social practice (Samerski, 2019), among others. Rademakers and Heijmans (2018) presented health literacy as having two aspects: functional/cognitive skills and capacity to act, the latter referring to ‘skills such as goal-setting, making a plan, taking action, persevering and being able to deal with temptations and adverse events or stress’ (p. 3). Furthermore, the authors urged future researchers to use more comprehensive health literacy conceptualizations and develop health literacy
measurements that represent multiple aspects of health literacy. According to Nikolaidou and Bellander (2020), health literacy is a set of practices unfolding in networked activity systems of people. The authors argued that health literacy ‘is mediated by access to expert and experiential knowledge constructed in parallel and interacting activities, such as oral interactions with medical staff, medical websites and social media’ (p. 2). Health literacy practices are seen to be experienced as meaningful when crossing between activities, of which others enable different kinds of knowledge and restrict others (Nikolaidou & Bellander, 2020). In this sense, health literacy can be understood to refer to the recontextualization of knowledge within activities in people’s everyday lives.

Lloyd et al. (2014), drawing from the information research perspective, questioned the conventional approaches to health literacy and stated that it is ‘a socially derived health information practice that connects people to ways of knowing, and enables them to draw from a range of information sources to inform the decisions that they make’ (p. 207). The authors argued that the ability to understand chronic illness and make related decisions, for example, requires that patients can draw information also from social sources in interaction with others and through their bodies (Lloyd et al., 2014). Following Papen’s (2005, 2009, 2013) seminal work on health literacy as a social practice, Fairbrother et al. (2016) and Samerski (2019) extended these ideas by presenting a sociocultural view on health literacy that employs ideas, for example, from the new literacies studies. In their study on children’s health literacy practices, Fairbrother et al. (2016) used Nutbeam’s (2000) health literacy dimensions of critical and interactive literacy to mobilize these dimensions to study how children actively construct meaning from health information through their own embodied experiences. The study drew on research within social studies of childhood, which has emphasized children’s active participation in their everyday lives, and the new literacies studies, which have focused on literacy as a social practice (Fairbrother et al., 2016). Samerski (2019) also drew on this idea in her qualitative study on German residents’ knowledge, creative practices and experiences concerning health and healthcare. Samerski described health literacy as a social practice that is situational and multidimensional – ‘comprised of different sources and forms of knowledge – and co-produced in social relations’ (p. 1). The findings of her study highlighted embodied experience and somatic knowledge as important drivers of health-related actions, aspects of human health knowledge that Samerski (2019) argued have been widely ignored in Western health systems and research on health and health literacy.
2.3.3 eHealth literacy

Along with new ICTs that enable efficient ways of seeking, communicating, using and creating information online, a growing interest has emerged in consumer health and development of digital solutions for tailoring health information for electronic (eHealth) purposes. This interest has demanded new conceptualizations of health literacy that can capture the meaning of health literacy in digital contexts, one of them being the concept of eHealth literacy by Norman and Skinner (2006a). The concept is based on Eng’s (2002) definition of electronic health or eHealth as ‘the use of emerging information and communication technology, especially the internet, to improve or enable health and health care’. To this, Norman and Skinner (2006a) added that consumer eHealth requires not only basic reading and writing skills but also working knowledge of computers, a basic understanding of science and the ‘social context that mediates how online health information is produced, transmitted, and received’ (p. 2). Thus, eHealth literacy was defined as ‘the ability to seek, find, understand, and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem’ (Norman & Skinner, 2006a, p. 2).

Along with the definition, Norman and Skinner (2006a) proposed a so-called eHealth literacy Lily-model, that captures six core literacy skills organized into two central types: analytical skills (traditional literacy and numeracy, media literacy and information literacy) and context-specific skills (health literacy, computer literacy and science literacy). According to Norman and Skinner (2006a), the analytical component of the model describes skills that are applicable to a variety of different information sources regardless of the topic or the context. The context-specific skills, on the other hand, are more often applied when encountered with a specific problem or circumstance (Norman & Skinner, 2006a).

Norman and Skinner’s definition and model of eHealth literacy have faced criticism for not fully capturing the competencies essential in digital environments (Bautista, 2015; Gilstad, 2014; Griebel et al., 2018). For instance, Gilstad (2014) argued that the Lily-model lacks ‘a focus on important competences, such as acknowledgement of the bodily experience of a health challenge, the procedural literacy of handling the tools and technologies, the contextual and the cultural literacy and the communicative expertise’ (p. 5). Taking these aspects into account, Gilstad (2014) proposed a new definition of the concept:
eHealth literacy is the ability to identify and define a health problem, to communicate, seek, understand, appraise and apply eHealth information and welfare technologies in the cultural, social and situational frame and to use the knowledge critically in order to solve the health problem. (p. 8)

In their review of the eHealth literacy concept and measures, Griebel et al. (2018) presented several gaps in research on the subject, including the clear lack of collective understanding of the concept or the measures to study it. Moreover, the authors acknowledged that eHealth literacy research is often patient-/citizen-/user-oriented and focuses on measuring literacy while simultaneously ignoring the theoretical underpinnings of the concept (Griebel et al., 2018). By combining aspects of the earlier eHealth literacy definitions and adding the notion of information creation as presented in the Framework for Information Literacy for Higher Education (ACRL, 2015), Griebel et al. (2018) defined eHealth literacy as follows:

*eHealth literacy includes a dynamic and context-specific set of individual and social factors as well as technology constraints (such as the fit of a system to a user) in the use of digital technologies to search, acquire, comprehend, appraise, communicate, apply and create health information in all contexts of healthcare with the goal of maintaining or improving the quality of life throughout the lifespan.* (p. 436)

Griebel et al. (2018), following Norman’s (2011) notion, particularly criticized the lack of interactive elements in the definition of eHealth literacy. These interactive aspects, described also as mobile health literacy, might require special types of competencies, such as using a smartphone app that uploads personal data to a cloud and assessing the safety of those types of services (Griebel et al., 2018). According to Norman (2011), eHealth literacy in the age of Web 2.0 should especially include social media–related skills, such as confidence in expressing oneself clearly in social interactions, abilities to synthesize professional and non-professional advice, and use of, for example, healthcare professionals to filter relevant and trustworthy information.

### 2.3.4 Health information literacy

The concept of health information literacy was outlined by the Medical Library Association (MLA) with the aim of embedding the concept of information literacy
in health contexts. The concept was developed by combining the concepts of health literacy and information literacy defined by the American Library Association (1989) as ‘a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information’. As a result, health information literacy was defined as follows:

the set of abilities needed to: recognize a health information need; identify likely information sources and use them to retrieve relevant information; assess the quality of the information and its applicability to a specific situation; and analyze, understand, and use the information to make good health decisions. (Shipman et al., 2009, p. 294)

As a concept, health information literacy originated in and has been used most often in the field of information studies (see e.g. Hirvonen et al., 2020). As a closely related concept to health literacy, health information literacy emphasizes information discovery instead of communication between health professionals and patients (Lawless et al., 2016). Moreover, the definition of health information literacy is seen as focusing on the process of information seeking, especially emphasizing the assessment of information sources that have been disregarded in the traditional definitions of health literacy (see e.g. Lawless et al., 2016). Hirvonen et al., (2020) noted that although the definitions of health literacy and health information literacy overlap in some cases, health information literacy could be considered to have value as a separate concept or sub-concept of information literacy and health literacy. Furthermore, Hirvonen et al. (2020) argued that ‘health information literacy builds upon a field of study dedicated to information related practices and capabilities, whereas health literacy research has a strong health promotional basis’ (p. 193).

Niemelä et al. (2012) indicated that the definition of health information literacy presumes that a person has adequate reading and writing skills but ignores the social dimension of information presented in Nutbeam’s (2000) health literacy definition emphasizing an individual’s communicative skills. Moreover, Niemelä et al. (2012) noted that since health information literacy ‘is mostly a matter of everyday occasions and general knowledge related to health and wellbeing’ (p. 126), the qualifier ‘everyday’ should be added to the definition. Thus, everyday health information literacy (EHIL) places health information literacy into everyday contexts ‘as a concept for studying laypersons’ general and nonprofessional abilities related to health information’ (Niemelä et al., 2012, p. 126).
2.3.5 Empirical research on health literacies

Although the health literacy research community has shown interest in the conceptual and theoretical development of the concept, the central focus of research has concentrated on empirically examining health literacy with quantitative methods within medical contexts (see e.g. Chinn, 2011; Guzys et al., 2015). Studies have tended to focus on assessing the literacy levels of different populations, such as patients or certain age groups (see e.g. Chinn; Guzys et al., 2015). The first health literacy assessment tools were designed to measure the functional health literacy skills of individuals in clinical settings (Parker et al., 1995). These measures are based on the widely criticized idea that individuals’ reading comprehension and numeracy skills are the central competencies needed when dealing with medical texts (see e.g. Guzys et al., 2015; Frisch et al., 2012; Haun et al., 2014). Therefore, other ways to measure health literacy have been developed in which the levels of health knowledge or self-efficacy of individuals are seen as indicators of health literacy. Knowledge tests that implicate health literacy are usually content- or context-specific and consist of true/false or multiple-choice questions covering knowledge of health issues (Frisch et al., 2012). Self-efficacy tests aim at reporting individuals’ self-perceived abilities to, for instance, collect, communicate and evaluate health information (Ishikawa et al., 2008) or rate individuals’ abilities to understand health-related material (Chew et al., 2004). Although both measurement types have been considered good additions to measure functional health literacy, the risk of measuring merely self-efficacy or behaviour instead of actual health literacy is seen as a major disadvantage of these measures (Frisch et al, 2012).

In online contexts, Norman and Skinner’s (2006b) eight-item eHEALS scale is a commonly used measure. The scale is aimed at measuring ‘consumers’ combined knowledge, comfort, and perceived skills at finding, evaluating, and applying electronic health information to health problems’ and is proposed to address the six literacy types presented in the so-called Lily model (Norman & Skinner, 2006a). In addition, on the basis of an overview of eHealth literacy research, Pohl et al. (2015) argued that the measures of eHealth literacy do not acknowledge the different personal backgrounds influencing the measured competencies, such as social and cultural factors. The eHealth literacy community, similar to that of health literacy (see e.g. Nguyen et al., 2017), has been criticized for its lack of agreement on how to operationalize the concept for measurement (Griebel et al., 2018). Griebel et al. (2018) suggested that new eHealth literacy tools should always consider the earlier
research and use a well-founded theoretical basis to place eHealth literacy into
broader contexts.

As noted earlier, qualitative health literacy studies are scarce, especially within
studies conducted in online contexts (Guzys et al., 2015). The few such studies that
exist examine the eHealth literacy of different groups, such as underserved
Hawaiians (Connolly & Crosby, 2014), young adults (Briones, 2015) and
individuals and couples facing infertility (Sykes et al., 2020). The qualitative
methods employed in these studies were focus group interviews (Connolly &
Crosby, 2014) and semi-structured interviews (Brione, 2015; Sykes et al., 2020).
The studies aimed at not only defining the examined populations’ eHealth literacy
levels (Connolly & Crosby, 2014) but examining, for instance, participants’
motivations for and access to online health information (Sykes et al, 2020) and the
ways they assess the quality and construct meaning of online health information
(Brione, 2015). Yates (2013, 2015) employed phenomenography including semi-
structured interviews to study the ways in which people experience health
information literacy: building health knowledge, discerning valid information and
paying attention to bodily information, for example. Chinn (2011) encouraged
researchers to employ qualitative approaches, such as interviews, observations and
ethnography, in studying health literacies, as they can reveal ‘how people actually
interact critically with health information in real-life situations’ (p. 65). These
health literacy practices could be enacted by individuals, health service users and
health workers, or by groups and communities informally or in health education
settings (Chinn, 2011). Following Chinn’s ideas, it can be argued that within the
contemporary information environment, the interaction with health information ‘in
real-life situations’ often occurs online, and therefore, qualitative research on health
literacies in online environments should be considered highly warranted.

2.4 Summary of the theoretical background

In the 1990s, the conceptualizations of literacy started to transform towards ‘softer’
skills and competencies required in the digital world due to technological changes
in the contemporary society (see e.g. Stordy, 2015). In the educational sciences,
this digital turn drew attention to new literacy practices that would be especially
vital in digital contexts (Mills, 2010). This gave rise to the new literacies
perspective which considers literacies as socially mediated and shaped by
technological tools (see e.g. Black, 2005; Gee, 1999; Lewis & Fabos, 2005). New
literacies as transformed and transforming social phenomena emerged along with
the rise of new ICTs and have moved the understanding of literacies from print-based towards literacies that deal with multimodal content in digital environments (see e.g. Lankshear & Knobel, 2011). Moreover, assigning plurality to literacy draws attention away from traditional, standardized models of literacy and towards acknowledging that there are numerous different literacies that ‘shift with contexts, texts, and the identities of people using literacy’ (Rowsell & Walsh, 2011, p. 55).

The new literacies studies have tended to employ practice theories and a sociocultural perspective and focus on educational contexts. However, the focus has been directed at online practices of people’s everyday contexts as well (see e.g. Gleason, 2016, 2018a, 2018). These studies have conceptualized social media content production, such as tweeting, as new literacy practices and have employed qualitative methods to study them.

The contemporary information literacy research can be roughly divided into skills and practice perspectives. The skills perspective emphasizes user behaviours in an information environment and the application and quantification of information literacy competencies (Addison & Meyers, 2013; Lloyd, 2017). Focusing on ‘creating a base-line’ for required information skills (Lloyd et al., 2014), the perspective is argued to be dominant especially within the education sector and among librarians and other information specialists (Addison & Meyers; Lloyd-Zantiotis, 2010; Sample, 2020). The practice perspective, in turn, frames information literacy a ‘set of practices involving tools and media that are deeply embedded in a particular context or activity’ (Addison & Meyers, 2013). Theoretically, studies adopting a practice perspective on information literacy have usually employed a sociocultural view on literacies emphasizing the relationship between individuals and various forms of collective practices (Limberg et al., 2012). This perspective is seen to be closely linked to the new literacies and multiliteracies perspectives emergent in the educational sciences (see chapter 2.1.1).

Connected to the practice perspective, the sociocultural view on information literacy focuses on the relation between action, physical and linguistic, and cultural tools that we use to communicate within a specific practice (Limberg et al., 2012; Wertsch, 1998). An example of a recent definition of information literacy from the sociocultural view is that of Lloyd (2017), who described information literacy as ‘a way of knowing’, a practice that is enacted in a social setting and is composed of different activities and skills ‘that reference structured and embodied knowledges and ways of knowing relevant to the context’ (p. 94). The ACRL framework is considered to take a progressive approach to information literacy by highlighting, for example, information creation and recognition of authoritative voices as crucial
information literacy competencies. However, information creation, which can be considered fundamental especially in the contemporary digital environment, has not yet been fully acknowledged within information literacy research (Hicks, 2020; Huvila et al., 2020; Kitzie, 2019) and, thus, warrants a new empirical and theoretical investigation.

Within health settings, the term health literacy is widely used to address literacy competencies related to health and well-being. First introduced in the 1970s following a discussion on health education as a social policy issue (Simonds, 1974), health literacy is usually defined as individuals’ capacity to obtain, process and understand basic health, similar to the early literacy definitions (see sub-chapter 2.1). The more recent definitions represent health literacy as a multidimensional concept acknowledging the breadth of skills in interaction with social and cultural contexts (Mårtensson & Hensig, 2012) and as a concept that, for example, recognizes people’s different capacities to find, understand and use health information in addition to the life experiences that shape people’s willingness and confidence to do these tasks (Batterham et al., 2017). Although the concept of health literacy has been under development for three decades, a clear consensus on the definition of the concept is lacking (Chinn, 2011; Guzys et al., 2015; Mackert et al., 2015; Sørensen, 2019; Sørensen et al., 2012; Sykes et al., 2013). In recent studies, health literacy has been conceptualized as a multidimensional concept describing it as the capacity to act (Rademakers & Heijmans, 2018) and as a social practice (Samerski, 2019). Samerski (2019), for example, stated that ‘health literacy as a social practice is situational, multidimensional – comprised of different sources and forms of knowledge – and co-produced in social relations’ (p. 1).

The concept of eHealth literacy was developed to capture the meaning of health literacy in digital contexts. Norman and Skinner’s (2006a) definition of eHealth literacy emphasizes that individuals require not only basic reading and writing skills but also working knowledge of computers, a basic understanding of science and the ‘social context that mediates how online health information is produced, transmitted, and received’ (p. 2). The concept of health information literacy, in contrast, emphasizes information discovery instead of communication between health professionals and patients (Lawless et al., 2016). The concept originated and has been used often in the field of information studies (see e.g. Hirvonen et al., 2020) and is closely related to health literacy. However, the definition of health information literacy is seen as focusing on the process of information seeking, especially emphasizing the assessment of information sources, which the
traditional definitions of health literacy have usually disregarded (see e.g. Lawless et al., 2016).

Empirical research on health literacy and related concepts has predominantly been quantitative and conducted within medical contexts, focusing on assessing the literacy levels of different populations, such as patients or certain age groups (see e.g. Chinn, 2011; Guzys et al., 2015). However, researchers have been encouraged to employ qualitative approaches, such as interviews, observations and ethnography to study health literacies, as they can reveal ‘how people actually interact critically with health information in real-life situations’, and these literacy practices are enacted by individuals, health service users and health workers, or by groups and communities informally or in health education settings (Chinn, 2011, p. 65). Moreover, as the interaction with health information in real-life situations often occurs online, qualitative research on health literacies in online environments is highly warranted.

In this thesis, I employ ideas from new literacies, information literacy and health literacy research presented in this chapter to examine new ways of understanding health information literacies. The research is grounded in the sociocultural perspective on information literacies, and literacies in general, as socially enacted practices. It considers the ideas of the new literacies studies that acknowledge the multimodality of information and the creation of information as a central literacy practice especially in online contexts. The thesis also critically examines previous health literacy research to explore new ideas about what information literacies may indicate in the context of health. Thus, this thesis aims to provide insight to foster an understanding of new health information literacies as a sociocultural phenomenon.
3 Research methodology

In this chapter, I present the methodological choices of this thesis. First, in section 3.1, I introduce the science philosophical background of the thesis as a whole. Next, in sub-chapter 3.2, I describe the theoretical-methodological approach of nexus analysis, including its core concepts and practical application in this research. In sub-chapter 3.3, I describe the two study phases, which were both structured to follow the nexus analytical research activities of engaging, navigating and changing. Data collection and analysis are presented within these sections as well. In this thesis, I use systematic analysis, interviews, video diaries and YouTube videos to investigate health information literacies in online environments, and I employ nexus analysis as a theoretical-methodological lens through which the two phases are looked at.

3.1 Science philosophical background

The science philosophical basis of this thesis lies within social constructionism and draws on the sociocultural and practice theoretical perspectives on literacies as socially enacted practices (see e.g. Limberg et al., 2012; Lloyd, 2010, 2011). It applies nexus analysis as a theoretical-methodological approach to investigate health information literacies. According to Burr (2015), social constructionism takes a critical stance towards traditional ways of understanding the world and ourselves. The view challenges positivism and empiricism, epistemological positions suggesting that our knowledge of the world can be obtained through objective and unbiased observation and ‘that what exists is what we perceive to exist’ (Burr, 2015, p. 3). Moreover, it opposes with determinism, which suggest that all human actions and ideas are outcomes of prior conditions and causes (Slater, 2017). Instead, social constructionism attempts to ‘make sense of reality’ (Slater, 2017, p. 1624) and understand ‘how certain phenomena or forms of knowledge are achieved by people in interaction’ (Burr, 2015, p. 11). In this sense, knowledge is not something that a person possesses or does not possess but something that people create and enact together (Burr, 2015). Slater (2017) described social constructionism as a sense-making process that is based on a ‘socially generated understanding of the world’ and the belief that

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3 Burr (2015) noted that there is no single definition of social constructionism, but a collective of writers who share common ideas and accepts one or more of the key assumptions of social constructionism (see also Gergen, 1985).
(1) reality is intimately linked to subjective experience; (2) subjective experience, while assimilated at the individual level, is nevertheless defined by broader social forces and effects; and subsequently (3) understanding of one’s personal experiences corresponds to socially constructed concepts that shape, direct, and normalize the meaning of such experiences. (p. 1628)

Social constructionism emerged in the latter half of the 20th century and is rooted in sociological and psychological theory and draws on several philosophical and scientific disciplines, including anthropology, critical analysis, hermeneutics, phenomenology, psychology, semiotics and sociology, among others (Slater, 2017). The term social constructionism first appeared in Berger and Luckmann’s (1966) seminal book *The Social Construction of Reality*, in which they argued that human beings together create and then sustain all social phenomena through social practices (Burr, 2015). In this account, social practice is understood as people’s habitualized actions repeated so often, they form a pattern (Berger & Luckmann, 1966). Social constructionism is often associated with postmodern thought that similarly stresses the social and situated nature of truth and knowledge claims but takes a more critical standpoint by considering the power relations intertwined with them (Baert et al., 2014).

This thesis approaches literacies by drawing on sociocultural and practice theories that are considered to be based on the social constructionist paradigm (Wang et al., 2011). Sociocultural theories constitute a set of theoretical constructs describing learning and development as embedded in social events and occurring in interaction with people, objects and events (Wang et al., 2011). The first sociocultural theorist, Lev Vygotsky (1896–1934), a Russian psychologist, addressed especially the importance of social and cultural contexts of human cognitive development (Vygotsky, 1978). Sociocultural theories stress that social and cultural engagement – that is, the social action of people – is mediated by culturally constructed tools, such as language, signs, symbols and physical artefacts (Säljö, 2000; Wang et al., 2011; Wertsch, 1998). These linguistic as well as physical tools are used to communicate in a specific social practice and, therefore, are considered highly contextual (Limberg et al., 2012; Säljö, 1999).

In line with sociocultural theories, practice theories highlight the social nature of human action (see e.g. Schatzki, 2002). Practice theories can be described as based on two approaches: one focusing on the historical and reproductive nature of practices (presented by researchers such as Bourdieu, Wittgenstein and Giddens) and another stressing the situated practices of people that are emergent, ongoing
and dynamic (presented by researchers such as Lave, Suchman and Latour; Talja & Nyce, 2015).

This thesis is qualitative and employs nexus analysis as its theoretical-methodological approach including an interpretive systematic review of literature and multimodal analysis of empirical data. As such, it considers the micro and macro forms of social constructionist theory which allowed focusing specifically on the ways information is approached and conceptualized within both large-scale academic discourses on health literacies in online environments and the microstructures of discourses and interaction within the social action in which these literacies are enacted (see e.g. Burr, 2015; Wetherell, 1998). This consideration is in line with the nexus analytical understanding of social action taking shape at the intersection of micro- and macro-level discourses (see Scollon & Scollon, 2004). Moreover, nexus analysis is understood to be closely linked to sociocultural and practice theories by not only claiming the concepts from these approaches but also rooting in the philosophical basis of social constructionism (see e.g. Larsen & Raudaskoski, 2018; Scollon & Scollon, 2007). For a more detailed description of the research methods, see sub-chapter 3.3.

3.2 Nexus analysis as a theoretical-methodological approach

For this thesis, nexus analysis provides a way to study the complex relationship between discourse and social action and the intersections of micro- and macro-level phenomena. Nexus analysis, developed by Suzie Wong Scollon and Ron Scollon (2004), can be described as a methodological extension of the ideas behind mediated discourse analysis (MDA) that is intended to integrate aspects of micro as well as macro dimensions in research on human action (see e.g. Jones & Norris, 2005; Scollon & Scollon, 2004, 2007).

As a multidisciplinary methodology, nexus analysis traces its roots to research traditions such as interactional sociolinguistics, linguistic anthropology, critical discourse analysis, practice theory, mediated action and activity theory, multimodal discourse analysis and the new literacies studies, to mention few (Hult, 2017; Kuure et al., 2018; Lane, 2014; Scollon & de Saint-Georges, 2012). Nexus analysis can be understood both as a form of ethnography and an action-oriented approach to discourse analysis (Scollon & Scollon, 2004). Several other research traditions

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* Mediated discourse analysis and nexus analysis are sometimes used synonymously (see e.g. Wohlwend, 2014).
focus on social action but, in practice, tend to foreground written or spoken discourse and disregard everything else merely as ‘context’ (Scollon, 2001). Nexus analysis is considered closely related to other socially oriented research traditions, such as sociocultural and practice theoretical approaches and discourse analytical approaches, owing to its combination of various elements of these approaches (see e.g. Scollon, 2001; Scollon & de Saint-Georges, 2012). Within empirical research, nexus analysis has been employed especially to study language learning and language policy (e.g. Kuure et al., 2018; Tumelius & Kuure, 2020), and literacies, such as teachers’ role in literacy education (Nygård, 2020, 2021; Räisänen, 2015), and children’s play and use of new technologies (Wohlwend, 2009, 2011, 2020). This thesis is among the first applications of nexus analysis within empirical research in the field of information studies. Previously, Hirvonen and Palmgren-Neuvonen (2019) applied nexus analysis in their investigation of students’ information literacy practices in classroom settings.

### 3.2.1 Core concepts of nexus analysis

Similar to sociocultural research approaches, nexus analysis regards all action as social and mediated by cultural tools (see Wertsch, 1991) – that is, semiotic resources, such as language – or physical tools, such as technological applications (Lane, 2014). In nexus analysis, these cultural tools are referred to as *mediational means*; these are, for instance, meaningful words, gestures, images, tools or combinations of these, such as literacy (Wohlwend, 2020). Therefore, as the semiotic and physical resources are often combined, human action, to some extent, always relies on materiality in addition to semiotic systems (Ivarsson et al., 2009). Moreover, the mediational means are seen to act as ‘carriers of history and culture’ in mediating people’s actions and interactions (Scollon, 2001; Scollon & de Saint-Georges, 2012).

A mediated action is considered to occur at the intersection of social practices and mediational means (Scollon, 2001). Within nexus analysis, social action is distinguished from *social practice*, the former describing actions that are always unique and irreversible (Scollon & de Saint-Georges, 2012). Drawing on Bourdieu (1977), Jones and Norris (2005) described a social practice as ‘a social action with a history’ (p. 9). In other words, a social practice can be understood as consisting of recurrent actions learnt through participation in everyday social life (Scollon & de Saint-Georges, 2012). Scollon (2001) defined a practice as ‘a historical accumulation within the habitus/historical body of the social actor of mediated
actions taken over his or her life (experience) and which are recognizable to other social actors as “the same” social action’ (p. 149). As these social practices become interconnected over time, they form a **nexus of practice**:

the point at which the historical trajectories of people, places, discourses, ideas, and objects come together to enable some action which in itself alters those historical trajectories in some way as those trajectories emanate this moment of social action. (Scollon & Scollon, 2004, p. 159)

Within the nexus analytical framework, social action is situated at the intersection or nexus of three key elements: the historical bodies of people engaging in the action, the mutually produced interaction order between participants and the discourses in place that enable or disable the action and/or are used by participants as mediational means (Lane, 2014; Scollon & Scollon, 2004). These key elements are illustrated in Figure 2.
Discourses in place refer to the wide range of discursive elements circulating throughout any given social action or its scene (Scollon & Scollon, 2003). These elements are seen to influence the interaction within that social action by inhibiting certain actions or enabling others (Martinviita et al., 2015). In nexus analysis, discourse is understood as a two-level construct, following Gee’s (1999) ideas of small- and large-scale discourses. The small-scale discourses describe language that is used ‘on site’ (Lane, 2014) in contrast to the large-scale Discourse (with a capital D) which refers to the ‘larger structures of social interaction’ (Jones & Norris, 2005, p. 10). Both types of discourses, understood in a narrow or broad sense, may appear in the given scene. The focus of analysis in nexus analysis is on the discourses that are relevant in the scene under study and, thus, used by participants as mediational means (Lane, 2014). Discourses take shape in written or spoken words, images or other semiotic aggregates, provided through, for instance, computer screens (see e.g. Scollon & Scollon, 2004).
Nexi...
cycles of discourses within the action (Scollon & Scollon, 2004). The aim is to enter a *zone of identification*, where the researcher is not an objective observer but becomes a participant in the nexus of practice (Kuure et al., 2018). Therefore, in practice, the initial task of nexus analysis is to determine what kinds of data should be collected and with what kinds of methods (Lane, 2014). The gathering and analysis of data are not distinct processes but intertwined, also described, for example, as a constant process of ‘zooming in’ and ‘zooming out’ of the social action under investigation (see e.g. Hult, 2016; Lane, 2014).

The *navigating* of the nexus of practice is considered the main activity of nexus analytical research by including a more detailed examination of the selected practices, discourses and social actions taking place (Lane, 2014). The task is to map the central cycles of people, places, discourses, objects and concepts circulating through the chosen social action (Scollon & Scollon, 2004). In practice, this activity of navigation involves the collection and analysis of data (Lane, 2014). The analysis may be guided by questions about, for instance, how the social action and mediational means came into the historical body of each participant, what discourses are foregrounded or backgrounded within the social action and what kind of interaction is present and among whom (see e.g. Scollon & Scollon, 2004). Scollon and Scollon (2004) noted that the stages of engaging and navigating are conceptually separate activities, but they often overlap in practice, occurring almost simultaneously. Throughout these two activities, the researcher is guided by the interaction with participants to narrow the scope of the research to include only relevant practices, discourses and social actions in the analysis (Lane, 2014).

The third activity of nexus analysis, *changing*, is considered to take place already when the researcher enters the scene and identifies the relevant actors in the social action – that is, establishes the *zone of identification* (Scollon & Scollon, 2004). The aim of a nexus analytical study is not to take a neutral position but to recognize that the researcher unavoidably brings about change just by engaging with the participants and when bringing the analysis back to the participants (Lane, 2014). Nonetheless, making a change within the nexus of practice may be a conscious step of nexus analysis (Hartikainen, 2017) and conducted through different methods, such as workshops or interventions. However, Scollon and Scollon (2004) noted that the researcher is not in a privileged position to bring about social change:

What you have to contribute as an ethnographer or nexus analyst is the time and skills to open up and make visible links and connections among the many
trajectories of historical bodies, discourses in place, and interaction order which constitute our social life. By your actions of analysis you are altering these trajectories for yourself and for the others in the nexus of practice and that in itself is producing social change. What these changes are will always remain to be seen as the nexus of practice is transformed over the time of the nexus analysis. (p. 178)

In addition, while the researcher may change the practices within the social action, this engagement may also change the researcher and influence the research questions, methods and theoretical choices made by the researcher (Lane, 2014). Thus, Lane (2014) suggested that ‘change brought about by nexus analysis should not be determined in advance, but develop as an outcome of the researcher’s engagement with a nexus of practice’ (p. 19).

3.3 Nexus analysis in investigating health literacies in online environments

This thesis consists of two phases examining health information literacies in online environments from two perspectives: the perspectives of academic and everyday discourse and practice. The engaging with the social action under investigation was shaped through phase 1, during which I conducted a systematic review of the current research on health literacies in online environments (sub-chapter 3.3.1). This enabled an investigation of the macro-level academic discourses of the selected subject and identification of research gaps, which guided the implementation of the second phase. Investigated through the nexus analytical research framework, phase 1 involved thoroughly engaging with the relevant discourses of the phenomenon and provided a deeper examination of the historical body of the phenomenon itself (on engaging, see Scollon & Scollon, 2004). In this manner, it also served as an adapted version of a discourses survey, which Scollon and Scollon (2004) recommended using as a tool to uncover key discourses about an issue (see e.g. Hartikainen, 2017; Vainionpää, 2021).

In phase 2, to investigate the phenomenon through a micro-level lens, I employed the sociocultural view on information literacy to study the everyday discourses and practices of health information literacies in a specific context. To do this, I integrated ideas of the new literacies studies which emphasize the multimodality and production of information within online environments (see e.g. Lankshear & Knobel, 2011) into information literacy research. Engaging with the
relevant social action and actors continued in the second phase, enabling a deeper exploration of the micro-level discourses and social actions taking place in relation to health information literacies in online environments (section 3.4). In this research, the navigating activity included the data collection with young video bloggers and the analysis of data using a nexus analytical research approach and related concepts (sub-chapter 3.4). Changing the nexus of practice within this thesis is discussed in chapter 5.

3.3.1 The perspective of academic discourse and practice: Systematic review of concepts, definitions and operationalization (phase 1)

To engage with the phenomenon, health literacies in online environments, I conducted a systematic review, the findings of which are reported in Studies I and II. The main objectives of the systematic review were to investigate what kinds of different health literacy concepts have been used in previous empirical research conducted in online information environments and how these concepts were defined and operationalized (Study II). Specifically, the objective was to investigate the role of information within the different health literacy definitions (Study I). The systematic review complements the sociocultural perspective of this thesis, as it is interpretive (Harden & Thomas, 2010) in nature and provides a narrative synthesis of different health literacy concepts and measures. Moreover, following Greenhalg et al.’s (2018) argument on the relation between narrative and systematic reviews, it provides interpretation and critique rather than just narrowly focused questions and summary of data often employed in conventional systematic reviews.

A systematic review is defined as ‘a review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyse data from the studies that are included in the review’ (Moher et al., 2009, p. 1006). The systematic review within this thesis follows, with its applicable parts, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) presented by Moher et al. (2009). The PRISMA statement aims to improve the transparency of reporting of systematic reviews and meta-analyses by providing clear guidelines including a checklist and a flow diagram (Moher et al., 2009). Recently, the PRISMA statement was updated to include a new reporting guideline that ‘reflects advances in methods to identify, select, appraise, and synthesise studies’ (Page et al., 2020, p. 1). Moreover, the new statement offers a broader description of systematic reviews:
[Systematic reviews] provide syntheses of the state of knowledge in a field, from which future research priorities can be identified; they can address questions that otherwise could not be answered by individual studies; they can identify problems in primary research that should be rectified in future studies; and they can generate or evaluate theories about how or why phenomena occur. (Page et al., 2020, p. 1)

Data sources and search strategy

For the systematic review, a search strategy was developed to identify articles examining health literacy or related concepts in online environments. The search terms covered three domains associated with the phenomenon: ‘online’, ‘health’ and ‘literacy’, including related terms. The detailed search strategy is reported in Appendix 1. In total, six academic databases were searched on 14 April 2016. These included Library and Information Science Abstracts (LISA), Applied Social Sciences Index and Abstracts (ASSIA), Education Resources Information Center (ERIC), U.S. National Library of Medicine premier bibliographic database (Medline), Library and Information Science and Technology Abstracts (LISTA) and Cumulative Index to Nursing and Allied Health Literature (CINAHL). These databases were perceived as the best options to represent the topic of the review and were accessible through the Oulu University library. The search was limited to title and abstract and to peer-reviewed articles published in English between 2011 and 2016. The time frame was chosen for consisting of a five-year period during which online information seeking (Fox & Duggan, 2013) and the use of social media (Pew Research Center, 2018) had increased considerably.

In addition to the above-listed databases, one academic journal (Computers in Human Behavior) was searched manually, as it was not indexed in the searched databases but appeared to have potential for finding relevant articles. The search resulted in a total of 1,289 articles, of which four articles were identified through the search from the additional academic journal.

Study selection and data analysis

The screening process for articles proceeded in two phases. First, after removing duplicates, the article titles and abstracts (n = 1,289) were screened to identify relevant articles for the full-text screening. A randomized 10% sample of these was screened by the second author of Studies I and II, resulting an interrater agreement
of 93%. Inclusion criteria were discussed and agreed upon between the first and second authors of the studies. Articles chosen for the full-text screening had to fulfil the following inclusion criteria:

1. Original, peer-reviewed, full-text article written in English
2. Topic of the article must concern literacy in the context of health
3. Informants of the study were laypeople, not health professionals or students of the field
4. Focus of the study must be health literacy in an online information environment

Second, in the selection process, 180 full-text articles were screened using a more detailed set of exclusion criteria. Of these, 109 records were excluded in Study I and after an elaborated screening of the full-texts, 112 records in Study II. Thus, after the selection process, 71 articles were included in Study I and 68 in Study II.

The following data were extracted from the selected articles:

1. Title
2. Authors
3. Publication title
4. Year of publication
5. Research area or discipline (according to the first author’s affiliation)
6. Aim or objective of the study
7. Method of data collection
8. Method of data analysis
9. Health literacy concept used
10. Definition of the concept

A detailed description of the article selection processes in Studies I and II is presented in the PRISMA flow chart (Fig. 3). The characteristics of the included studies are presented in Appendix 2.
Fig. 3. PRISMA flow chart of study selection process (adapted from Moher et al., 2009)
The systematic review presented in this thesis is qualitative in nature and employs an interpretive approach (Harden & Thomas, 2010) with an emphasis on the integration of research across disciplines to create a synthesis of the data. According to Harden and Thomas (2010), an interpretive synthesis is dependent on the judgements of the reviewer ‘to pick out the most salient aspects of the studies in order to create a synthesis that is uniquely the reviewer’s own’. With this in mind, the analysis focused on reviewing health literacy concepts and definitions (Studies I and II) and their operationalization (Study II) in studies focused on online information environments. The analysis began with identifying the health literacy concepts and definitions used in each selected article. In Study I, the analysis focused on examining how the definitions of health literacy approached information, particularly how health information was described and framed, and what kinds of roles were established for information in the definitions. In Study II, the focus was on health literacy concepts, definitions and means of measuring health literacy – that is, how the concepts were operationalized in the selected articles. According to their definitions, the concepts were grouped into thematic categories drawn from the data and followed the remarks made on health literacy research in earlier literature. For a detailed description of health literacy concepts and definitions in the included articles, see Appendix 3.

3.3.2 The perspective of everyday discourse and practice: Young video bloggers’ information literacy practices (phase 2)

The starting point of phase 2 was to investigate how young people engage with health-related information online and create it themselves in their everyday settings, with a focus on their health information literacy practices. Whereas the systematic review enabled engaging with the academic discourses on health literacies in online environments, the second phase aimed at engaging with the everyday health-related information literacy practices that people engage with on social media. The focus was directed at the creation of health information in this context to follow the understanding of the new literacies research in which the creation of new information is seen as a crucial part of enacting literacies especially in online environments (see e.g. Lankshear & Knobel, 2011). Young people were chosen as an appropriate age group, as they have become the most active users of digital technologies (Third et al., 2017) and are increasingly turning to social media not only to find health information (Swist et al., 2017; Wartella et al., 2016) but to create it themselves (see e.g. Balleys et al., 2020). Moreover, similar to the
systematic review in phase 1, a particular focus was placed on the role of information in health information literacy practices. This included, for example, examining practices related to information seeking and assessment and remixing information. After a careful investigation of the online information environments with which young people engage in their everyday lives, I chose to narrow the focus of the investigation to information creation practices on social media platforms, such as blogs. However, after surveying this scene and related media discourses (for a scenes survey, see Scollon & Scollon, 2004), I further narrowed the focus to video blogging, as this appeared at the time (in 2018) to be a highly popular everyday scene of content creation for young people (see e.g. Anderson & Jiang, 2018). Moreover, video blogging on YouTube is an ideal phenomenon to study information creation because it encompasses multimodality and the potentially authoritative position of the content creator. More recently, TikTok has emerged as an important content creation platform for young people. Although this platform became popular in the United States late in 2018, in Finland its use peaked later (see e.g. Ebrand Group, 2019). The engaging process continued with familiarizing myself with video blogging practices and, for example, watching video blogs on YouTube, participating in events organized by a video blogging community (e.g. TubeTour 2019 in Oulu, Finland) and reading relevant studies on social media content production. This allowed me to explore the interaction order in video blogging – whether the people doing video blogging are usually alone, in small ‘withs’, or if the actions occur in task groups or teams or as performances before audiences, for example (Scollon & Scollon, 2004). The performative nature of video blogging became apparent after a careful exploration of the central practices related to the actions. In addition, the video bloggers appeared to usually create the videos alone or in small groups. Thus, I decided the best way to explore video blogging would be to recruit individual video bloggers for the research.

**Participant recruitment**

Participant recruitment started with disseminating a study call on social media and contacting relevant organizations and companies by e-mail (e.g. influencer marketing companies Troot Oy and Splay One). As this did not result in any contact from potential candidates, I started contacting individual video bloggers by e-mail and private messages on social media. Other than being Finnish, having an interest in health issues (according to their YouTube accounts) and being aged between 15 to 24 years (definition of youth by UNESCO, 2021), no specific criteria existed for
participation in the research. After a rigorous round of sending several e-mails, three young video bloggers agreed to participate. The participants were as follows (names are pseudonyms):

– Jane, a 16-year-old high school student with five years of experience in video blogging and an estimated 39,000 YouTube followers
– Laura, a 22-year-old university student with a history in blogging and a few months of experience in video blogging and approximately 3,800 YouTube followers
– Emma, a 24-year-old employed woman who was a beginner in video blogging with approximately 20 followers of her YouTube account

According to the participants’ own descriptions, their followers were mostly young people interested in slime videos (Jane) and study-related issues (Laura). Emma’s followers were mainly her family members and friends.

**Data collection and analysis**

After the engaging phase, I began navigating the actions of video blogging by conducting qualitative data collection between December 2018 and June 2019. To increase the credibility and rigour of the research through data triangulation (Lincoln & Guba, 1985), and following the nexus analytical research process, different types of data were collected:

– YouTube videos that the participants published
– video diary data
– interview data collected before and after the participants published the YouTube videos (see Table 1)

The participants were asked to create a health-related video on their YouTube account on a topic of their choice and to document the process, from the beginning to the publication of the video, in a video diary. They were asked to use this video diary to explain the planning of the video including the information sources they used and ideas about presentation. They were also asked to reflect the whole creation process including the comments received on the video on YouTube.

The research process as a whole followed the guidelines for empirical research ethics, including consent procedures for the humanities and social and behavioural

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5 Slime is a squishy polymer substance that can be made from a mixture of household items.
This included a written consent form collected from the participants before data collection. As descriptions of the videos presented in the study may have provided enough information to identify the participants, the participants were asked for additional permission, which they all provided, to include these descriptions in the original article and this thesis. All names presented in the descriptions of data are pseudonyms.

The participant interviews (N = 3) were unstructured (see e.g. O’Reilly & Dogra, 2017) and themed with topics relevant to the research: participants’ background and experience in video blogging, information seeking and assessment, and general thoughts about health and well-being (see the interview questions in Appendix 4). The length of the audio-recorded interviews varied from 23 minutes to 1 hour and 5 minutes, resulting in total in 4 hours and 20 minutes of data. The length of the video diaries ranged from 5 to 10 minutes, resulting in a total of 23 minutes of video data. The YouTube videos published on the participants’ accounts varied from 8 to 18 minutes in length, adding up to a total of 34 minutes of video data. As a whole, the data comprise 5 hours and 18 minutes of audio and video data. For a detailed description of the collected data, see Table 1.

### Table 1. The collected multimodal data by type and participant

<table>
<thead>
<tr>
<th>Data, minutes [identifier]</th>
<th>Participant</th>
<th>Total (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-interview</td>
<td>Jane [Jane_pre]</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>Laura [Laura_pre]</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Emma [Emma_pre]</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>186</td>
</tr>
<tr>
<td>Video diary</td>
<td>Jane [Jane_diary]</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Laura [Laura_diary]</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Emma [Emma_diary]</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>23</td>
</tr>
<tr>
<td>YouTube video</td>
<td>Jane [Jane_video]</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Laura [Laura_video]</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Emma [Emma_video]</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>34</td>
</tr>
<tr>
<td>Post-interview</td>
<td>Jane [Jane_post]</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Laura [Laura_post]</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Emma [Emma_post]</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>75</td>
</tr>
<tr>
<td>Total (min)</td>
<td></td>
<td>318 (5 h 18 min)</td>
</tr>
</tbody>
</table>

The participants produced a rich set of multimodal data that represents the complexity of creating a YouTube video. Data triangulation enabled an exploration of the participants’ social actions from different perspectives. To ensure the dependability (Lincoln & Guba, 1985) of the study process, all the data, including YouTube videos and video diaries, were transcribed verbatim, analysed, annotated

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and coded using qualitative analysis software QSR NVivo. The analysis of video data focused on the visual and audio elements in addition to spoken and written language. Furthermore, to ensure the credibility and conformability of the data collection and analysis, the participants were contacted to confirm the preliminary findings (member checking) and regular researcher meetings and data sessions were arranged (for peer debriefings, see e.g. Lincoln & Guba, 1985).

The data analysis was guided by the three key elements of social action within nexus analytical research: discourses in place, interaction order and historical body. Appendix 5 (Studies III and IV; see also Räsänen, 2015) describes the guiding questions based on these elements that were used to give direction to the analysis. The analysis focused on identifying relevant health information literacy practices within the information creation process, such as information seeking and assessing the credibility of different sources. The analysis also focused on investigating how participants used information sources for the purposes of their videos. Following the nexus analytical guidelines (Scollon & Scollon, 2004), the different types of data aimed to give insight into the different perspectives of the social action under investigation. The interviews and video diaries enabled exploring how participants generalized their actions and experiences and how they described interactions with others. The YouTube video observations enabled ‘neutral’ observations of the participants’ actions, and for example, consideration of what the participants decided to show the audience.
4 Summary of the findings

In this chapter, I present a summary of the findings of phases 1 and 2, which comprise four original research articles (Studies I–IV). The findings are structured to answer the three research questions of this thesis. In sub-chapter 4.1, I present the findings of a systematic review pursued to examine how health literacies are studied, defined and operationalized for measurement in research conducted within online environments. In particular, the review focused on investigating the role of information within these conceptualizations. Although nexus analysis was not explicitly used in the original review articles (I and II), for this phase of the research, this theoretical-methodological lens offers insight into, and an effective way to engage with, the academic discourses and practices circulating through the health literacy research community. In sub-chapter 4.1.3, I discuss the main findings and research gaps identified in phase 1 (Studies I and II) and suggest a possible way to fill these gaps (Study III). In sub-chapter 4.2, I present the findings from phase 2. To investigate the everyday discourses and practices related to health literacies in online environments, this phase focused on studying the health information literacy practices of young video bloggers within an information creation process (Studies III and IV). Studies III and IV employed the same data. Study III concentrated on the central concepts of nexus analysis and its potential for information literacy research from a general perspective and Study IV focused on the analysis and findings of the study.

4.1 Health literacies in online environments: Engaging with academic discourse and practices (phase 1)

In this section, I introduce the findings of phase 1, a systematic review with the aim of investigating how health literacies are studied, defined and operationalized in research conducted within online environments. A special focus was placed on investigating the role of information within these conceptualizations.

Although different disciplines were represented in the reviewed studies (n = 71) examining health literacy or related concepts in online environments, the majority of them were conducted within medical or health sciences. Other fields presented were communication, marketing, psychology and information studies/library and information science. Few studies represented the field of sociology. The review indicated that the studies were predominantly quantitative in nature and primarily used a questionnaire as the only data collection method. Mixed
data collection methods, such as a combination of questionnaire and interviews or observations, were not common. Furthermore, qualitative analysis methods were used very rarely, if at all. Similar findings on the use of different types of data collection and analysis methods have been presented within health literacies studies in general (see e.g. Chinn, 2011; Guzys et al., 2015). The reviewed studies focused on different populations, usually on patients or adults having risk factors for a certain disease, older adults or veterans, or the general public. Students were also studied, but overall, children or young people were not represented within these studies.

4.1.1 Academic discourses on health literacies: Definitions and their approach to information

Eight different health literacy concepts with 21 definitions were identified in the systematic review. The definitions were grouped into three thematic categories following remarks made in earlier health literacy literature (see e.g. Altin et al., 2014; Mårtensson & Hensig, 2012) and representing the main ethos of each definition (see Appendix 3). The categories were as follows:

- health literacy as general and skill-based
- health literacy as multidimensional
- health literacy as a domain-specific concept

The definitions describing health literacy as an individual’s skills to obtain and utilize health information to ensure better health were categorized as general and skills-based health literacy concepts. These definitions approached information from two perspectives: First, health information was portrayed as general information obtained through information seeking; second, health literacy was described as basic skills to acquire, process and understand health information and as something to be utilized universally in decision-making situations. According to the reviews, the most frequently used health literacy definition of this kind was the one presented by Ratzan and Parker (2000) describing health literacy as a capacity that individuals possess to varying degrees. Within this definition, information was framed as something that an individual should ‘obtain, process and understand’ at a basic level to make ‘appropriate health decisions’ (Ratzan & Parker, 2000, p. vi). The MLA’s definition of health information literacy (Shipman et al., 2009) and its re-conceptualization, everyday health information literacy (Niemelä et al., 2012), fell within this category as well. These concepts were introduced and have been
predominantly used in the field of information studies. Therefore, they focus on the attribute of information. A health information–literate person, according to the definition (Shipman et al., 2009), should be able to ‘recognize a health information need’, identify likely sources from which to retrieve relevant information, assess the quality and applicability of the information and ‘analyze, understand, and use the information to make good health decisions’. This definition stresses the information-seeking process and especially individuals’ abilities to identify information needs, potential sources and assess the relevance of the gained information. These aspects were not present in other skills-based health literacy definitions. Moreover, neither other definitions of health literacy nor the definition of health information literacy specify the type of health information with which individuals are dealing. However, the definition of everyday health information literacy addresses health information acquired in everyday situations. This is unique within the health literacy research.

Multidimensional health literacy concepts usually included a model consisting of several attributes, such as basic reading and writing skills combined with influential social factors and the cultural context (see e.g. Baker, 2006; Sørensen et al., 2012; Zarcadoolas et al., 2005). Critical appraisal of the retrieved information was taken into account more thoroughly in these models, and some even emphasized awareness of possible ‘biased authorities’ (see e.g. Zarcadoolas et al., 2005). The role of information in multidimensional health literacy concepts was holistic; information and knowledge were gained not only through information seeking but also from prior experiences, as presented in the health literacy models of Baker (2006) and Zarcadoolas et al. (2005). In addition, these definitions often understood literacies, along with information, from a sociocultural perspective, as a ‘relationship between one’s actions and the larger social group’ (Zarcadoolas et al., 2012 p. 63). However, the review indicated that these multidimensional definitions of health literacy were used very rarely, perhaps due to difficulties in operationalizing them into measurements.

Most of the reviewed studies adopted a domain-specific health literacy concept, which usually focused on a specific context or targeted a specific patient group. Within these definitions, information was understood as highly contextual. For example, information seeking was seen to differ when undertaken in different contexts and when dealing with different types of information. The most often used domain-specific concept was the eHealth literacy coined by Norman and Skinner (2006a), targeted at detecting health literacy especially in online contexts. Similar to health information literacy, the definition of eHealth literacy addresses
information seeking and retrieval as the first steps of becoming a health-literate individual. Appraisal of the retrieved information was mentioned as well. Other domain-specific concepts identified in the systematic review included mental health literacy, oral health literacy and bad health literacy. Of these, the concept of bad health literacy was used in one study and referred to individuals who were literate enough to find, understand and process even low-quality information from online sources, for example, but failed to differentiate ‘false, irrelevant or fraudulent’ information from seemingly trustworthy information (Allam et al., 2014).

4.1.2 Academic practices of measuring health literacies: Operationalizing concepts for measurement

According to the review, health literacy within online contexts was typically operationalized by using self-efficacy measures aimed at detecting the health literacy levels of patients and the general adult population. These measures tended to be based on health-related questions for screening individuals’ self-reported skills (see e.g. Mancuso, 2009; O’Neill et al., 2014).

The general health literacy concepts were operationalized by using reading comprehension and numeracy measures to detect the health literacy levels of a certain population. Such measures were often simple, based on reading comprehension or pronunciation questions. For example, the most often used general health literacy measure in this review, the Newest Vital Sign (Weiss et al., 2005), consists of six questions regarding a nutrition label on an ice cream container. Another commonly used measure, the Rapid Estimate of Adult Literacy in Medicine (REALM; Davis et al., 1993), is an oral reading and recognition test which measures patients’ ability to pronounce common medical words. In a few studies, general health literacy was measured with self-efficacy measures and knowledge tests, performance tests and qualitative assessment. Typically, the self-efficacy measures included only a few items, such as questions about using the internet to seek health information, reading problems and confidence in filling in medical forms. Multifaceted self-efficacy measures were used less frequently but included multiple questions related to, for example, frequency of the patient’s health-related actions (Functional Communicative and Critical Health Literacy [FCCHL] scale; Ishikawa et al., 2008). The only measure aimed at screening the health information literacy levels of ‘laypersons’, the EHIL screening tool (Niemelä et al., 2012), was used in one reviewed study. EHIL aims to ‘detect
individuals with problems related to their interest and motivation, finding, understanding, evaluating and using of health information but being literate at the average level’ with 10 statements based on the person’s self-report (Niemelä et al., 2012, p. 130). EHIL was one of the few measures within the reviewed studies highlighting information as the central element of health-related literacy skills.

The operationalization of multidimensional health literacy concepts varied, and several different measures were used. A few studies used self-efficacy measures, such as the FCCHL scale and a single-item health literacy measure by Chew et al. (2004). Only one study used several measures including reading comprehension, numeracy and self-efficacy measures. Noticeable within this category of the review were clear inconsistencies in the operationalization of multidimensional concepts. Although the concept of health literacy was described as including several attributes, the measures included few items and, thus, did not represent those attributes in practice.

The domain-specific health literacy concepts were most often operationalized by using self-efficacy measures. Of these, the most frequently used one was the eHealth Literacy Scale (eHEALS) to measure ‘consumers’ combined knowledge, comfort, and perceived skills at finding, evaluating, and applying electronic health information to health problems’ (Norman & Skinner, 2006b). eHEALS consists of eight questions seeking self-reported skills and confidence in finding, using and assessing online health information (Norman & Skinner, 2006b). Although eHEALS does frame health information as an important attribute of health literacy, within the reviewed articles, the scale was described merely as a measurement that detects consumers’ perceived information technology or computer skills. Moreover, the aspect of seeking health information on the internet was seen as central to the scale. Other measurement types used in articles that adopted a domain-specific health literacy concept were health knowledge tests, information retrieval performance tests and a combined measure of reading comprehension, numeracy and knowledge. In one study, eHealth literacy was measured via a qualitative assessment method based on focus group discussion (Connolly & Crosby, 2014).

### 4.1.3 Finding ways to fill in research gaps

This section critically examines the previous research on health literacies and introduces ways to fill in the identified research gaps. The findings of the review are in line with earlier reviews showing that the health literacy community lacks
consensus on how to define health literacy (see e.g. Guzys et al., 2015; Mackert et al., 2015; McCormack et al., 2013; Sørensen et al., 2012). Moreover, health literacy research is often quantitative and focused on detecting the basic health literacy levels of individuals with reading comprehension, numeracy or self-efficacy measures. The operationalization of health literacy concepts within research in online contexts appears challenging and inconsistencies are observable. It seems that the aim of health literacy definition development is to create a definition that is simple enough to serve the purposes of measurement design. However, as earlier reviews have stated, health literacy cannot be denoted merely as reading comprehension or pronunciation skills related to health (Chinn, 2011; Samerski, 2019). The findings of phase 1 presented a clear mismatch between the concepts and measures of health literacy and, accordingly, show that measurement development has fallen behind. In other words, the academic discourse on health literacies appears to be regenerating and prone to concept development, whereas the practice of measuring health literacies is degenerating.

As the review showed, health literacy can be understood as a multifaceted set of skills or competencies influenced by cultural and social factors. As indicated by the findings, this multidimensional understanding of health literacies may not be easily operationalized for measurement but is still a valuable research topic. For this thesis, which seeks to gain a deep understanding of health information literacies in online contexts by taking a sociocultural perspective on literacies as socially constructed phenomena, the current measures do not offer useful tools that would cover these aspects. Typically, the definitions and measures of health literacy do not take into account the transforming practices emerging especially in online contexts, although some of the measures focus on the screening skills needed in these environments.

The historical body of health literacy research seems to be constructed on the original idea of health literacy as a tool for healthcare services and benefitting public health. This view is still visible in the definitions of health literacy and academic discourses related to health literacy. Similarly, the interaction order seems to be focused on interrelated discussions among medical and health sciences researchers and specialists. The contexts of everyday life are examined very rarely, although these aspects of human life have been studied in other fields of literacy research, such as the new literacies studies and information literacy research.

To contribute to filling in research gaps identified in previous research, phase 2 investigated young people’s everyday health information literacy practices in online contexts. Specifically, the research adopted a sociocultural approach and
focused on information creation, an aspect of literacies often disregarded in empirical information literacy research (see e.g. Hicks, 2020; Kitzie, 2019) but discussed to some extent from theoretical perspectives (see e.g. Huvila et al., 2020) and acknowledged in a few practical information literacy models (see e.g. ACRL, 2015). In addition to information literacy and health literacy perspectives, the thesis employs views from the new literacies studies (see e.g. Lankshear & Knobel, 2011) which highlight the creation of informational content and the emergence of new ICTs in the everyday lives of people. This enables an investigation of health information literacies in online contexts from perspectives not indicated in the findings of the review: information creation as part of the health information literacy practices of young people. In phase 2, instead of health literacy, the concept of health information literacies was used, as it was seen to more effectively serve the research purposes, which concerned the aspect of information and related practices. In particular, the notions of seeking and assessing information as central to information literacies were considered important for phase 2.

4.2 Health literacies in online environments: Navigating health information literacy practices of young video bloggers (phase 2)

This sub-chapter introduces the findings of phase 2, which aimed at empirically investigating the information literacy practices of young video bloggers creating health-related videos on YouTube. Guided by the nexus analytical concepts of discourses in place, interaction order and historical body (see Fig. 4), the investigation focused on the ways these aspects influenced the information creation process and, through it, the information practices as well. The participants were Jane, a 16-year-old high school student; Laura, a 22-year-old university student; and Emma, a 24-year-old employed woman. The data consisted of video diary data [participant_diary], pre- and post-interviews [participant_pre] [participant_post] and YouTube videos created by the participants [participant_video]. A detailed description of the data can be found in chapter 3.3.2.
4.2.1 Information literacy practices in the information creation process

The participants’ information literacy practices during the process of creating YouTube videos varied and appeared to be related to the topic of the video, constructed either on the basis of first-hand or second-hand information or a remix of these. The topics represented aspects of the participants’ historical bodies and, for them, information seeking appeared important if their own previous knowledge or experience related to the topic was scarce. For example, Jane decided to create a video about stress which she had been struggling with earlier. She used several tools (mediational means) to find information, such as her mobile phone and laptop. Moreover, she found an online health library article presenting tips on dealing with stress and stated that those tips were ‘really reasonable’ and that she ‘would
definitely use some of them’ [Jane_diary]. In the post-interview, Jane commented that she used the tips ‘to give direction’ and that she wanted to use them as a basis for the video, as they ‘felt close’ to her own experiences. However, despite searching for additional information by googling the word ‘stress’, Jane did not mention using other information sources in the video [Jane_post]. This exemplifies that Jane employed remixing of information (see e.g. Koh, 2013) as a central information practice during her video creation process.

For Laura, information seeking appeared to be the most central practice in the video creation process. Her other information literacy practices included taking notes on the scientific articles she had found online, writing a manuscript and printing it out to help organize the presentation of information in the video [Laura_diary]. Laura’s chosen topic for the video was Autonomous Sensory Meridian Response (ASMR6). She was familiar with this topic owing to her own ASMR videos. However, as she was not familiar with the scientific background of the phenomenon, she decided to do the video from this point of view and, at the same time, fulfil her own information need (see e.g. Koh, 2013) [Laura_diary]. In the pre-interview, Laura explained that her usual information-seeking practices during a video creation process included checking the facts so that ‘the information I have at the moment, is it at the moment, like, still accurate, so that here isn’t something stuck with me on the way’ [Laura_pre]. Moreover, she usually sought information online using university library databases and sometimes searched directly with the name of a researcher who she knew had studied the topic [Laura_pre].

For the third participant, Emma, information seeking did not appear to be a central information literacy practice. Instead, Emma concentrated on planning the video, which she filmed during a winter vacation. Her initial plan had been to film quite spontaneously and make the YouTube video ‘a summary, like the whole trip’ [Emma_diary]. However, in the post-interview, Emma explained that she had searched for suitable music for the video: ‘I searched the internet with different search terms … where I can find that kind of legal music which would altogether be suitable for it’ [Emma_post]. In the pre-interview, Emma explained that for her, in general, information seeking on health means mainly googling interesting topics that she has come across online and ‘just jumping from site to site to find out what

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6 ASMR is a popular type of video on YouTube in which the video producer talks very quietly, almost whispering, into a microphone, scratches different surfaces or makes sounds with their mouth to produce a tingling experience for the viewer.
they offer’. Sometimes, she used YouTube to find information about a certain issue and ‘if someone had done’ a video on the topic [Emma_pre]. During the video creation process, Emma seemed to rely heavily on her embodied knowledge of a healthy lifestyle. In the final YouTube video, Emma modelled embodied practices used in activities, such as downhill skiing and a snowmobile safari, presenting the performative nature of her information practices (see e.g. Olsson, 2010a, 2010b).

4.2.2 Discourses in place within information creation processes

In terms of information literacy practices, the most apparent discourses in place with each of the participants were associated with the credibility of information sources, acceptable sources and authenticity of information and self in general. Jane’s talk and actions while creating the YouTube video foregrounded two occasionally contradictory discourses in place related to the use and credibility assessment of information sources: one prioritizing first-hand information based on her own experiences and another emphasizing credible and acceptable sources of second-hand information (Wilson, 1983). In the post-interview, Jane explained that she wanted the topic to be ‘current’ for herself so that she ‘would have naturally more to say’ about it [Jane_post]. This emphasizes the importance of first-hand experience to Jane. Moreover, it explains Jane’s motivation for creating the video: fulfilling her information needs. The pre-interview provided insight into the information literacy practices regarding the use of second-hand information that Jane had learnt previously in school. Jane explained that the credibility of information sources had been addressed in school and, for example, her teachers had stressed the need to use other sources in addition to Wikipedia when doing school tasks because ‘there is the possibility that anyone can edit’ Wikipedia. However, Jane expressed that ‘if you think of it with common sense, if you read something in there that is suspicious for you, you can always check it’ [Jane_pre].

A central discourse in place within Laura’s information creation process regarded the credibility of scientific information with which she worked on a daily basis in her studies at the university and used also in the YouTube video. For Laura, using scientific information as a source for the video appeared to indicate the credibility of her video as a whole: ‘if there is not any scientific ground, it kind of eats its own credibility to the topic’ [Laura_pre]. In the post-interview, Laura explained her information literacy practices for assessing the credibility of the sources she found: ‘Well, for example, some of them were like those that were cited often and published in some reasonably good journals. And the sample sizes and
methods seemed reasonable and the study was conducted, like, following good research and scientific [principles'] [Laura_post].

A discourse on authenticity was foregrounded in Emma’s talk and actions during the video creation process. Emma described authenticity as essential for any health-related YouTube channel. When discussing the general trustworthiness of video bloggers, Emma explained that ‘you can be credible when you are yourself and do not try to act anything’, and she continued that ‘for me, it’s like, be your own genuine self; it does not need anything else’ [Emma_pre]. For Emma, authenticity appeared to be related to the credibility and general trustworthiness of a video and the video blogger. Grounded in her embodied knowledge and through a strong visual narrative in her YouTube video, Emma was able to express her values and show her viewers how she maintains good health. In this manner, authenticity played a crucial part in the embodied information practices she wanted to display.

4.2.3 Interaction order setting frames for action

The interaction order during each video creation process concerned relations between the participant, researcher, anticipated audience of the video and the video blogging community as a whole. The participants appeared to position themselves differently in relation to their audience and the researcher. In the interviews and video diary, Jane adopted the position of an informant, referring, for example, to the school norms for source credibility. This may reflect Jane’s need to meet the expectations of the researcher. In her YouTube video, however, Jane took on the role of adviser, grounded in her own experience with the topic rather than second-hand information. Earlier, during the pre-interview, Jane had explained that she might exert an influence on her audience: ‘When I was making the video [about a vegan diet], I thought that I could really influence what people are doing’ [Jane_pre].

Within Laura’s information creation process, several relations representing the interaction order were noticeable. For her anticipated audience, Laura wanted to appear convincing: ‘somehow, when making this type of scientific video, there is big pressure that everything is 100% okay and that the video has to be convincing’ [Laura_post]. To make the video convincing, Laura rigorously searched scientific information and used two workdays to find and review studies. These information literacy practices follow the norms and conventions of information seeking within university studies and scientific research in general and, therefore, represent Laura’s historical body in these institutions. In relation to the researcher, a similar
observation could be made: When asked whether participation in the study influenced her approach to creating the video, Laura explained that she made the video ‘more carefully’ because of it, searched more information and ‘somehow paid more attention to these things’ [Laura_post].

Emma’s talk and actions in the interviews and video diary represented aspects of her positioning herself as a beginner in video blogging. She described video blogging as a hobby that she is still learning and stated that she is a beginner [Emma_pre, Emma_post, Emma_video diary]. However, this aspect was not evident in her YouTube video, which was technically well executed. Emma’s relationship with her audience did not appear close, as the video lacked direct verbal communication with the anticipated audience.

4.2.4 Historical body as an accumulation of gained knowledge

The participants’ historical bodies appeared to affect not only the selection of the topic of the video but also the crucial information literacy practices the participants employed during the information creation process. Jane explained in the pre-interview that at 16 years old, she had been video blogging for almost five years and was especially accustomed to making ‘topic videos’ similar to the video she made for the study. She had learned to edit videos by herself and was fluent in two languages including her native language, Finnish. This helped her retrieve a greater variety of information on different topics. In the pre-interview, Jane also explained that her aim in video blogging was to present her true personality and ‘just altogether who I am’. These aspects of Jane’s historical body may explain why she searched for additional information for her YouTube video but chose not to mention the source of this information in the final video.

According to the pre-interview, 22-year-old Laura had six years of experience in writing a blog and had started making YouTube videos recently. She explained that her motivation for starting a YouTube channel had been based on discussions with her younger friends and the fact that blogs are not that popular anymore. In addition, she wanted to have more interaction with her audience. Having studied psychology at university, Laura was especially interested in making videos about mental health. She also wanted to make videos about psychology studies and, for example, entrance examinations, about which she had been writing in her blog. In the pre-interview, Laura indicated that the experience she had gained through her studies marked her competence: ‘and as I am studying psychology, I know things’ [Laura_pre].
Emma explained in the pre-interview that at 24 years of age, she had just started her YouTube channel and had recorded a few videos already. In the future, she wanted to concentrate on making videos about health topics because she had been pursuing a healthier lifestyle for a while already. She also wanted to have a career in the wellness industry, which provided motivation for making videos. Emma considered herself a beginner at video blogging and wanted to learn editing and the use of different tools as a hobby [Emma_pre]. In the post-interview, Emma suggested this beginner position by explaining difficulties in finding legal music to use in the video and not being ‘a top’ video blogger [Emma_post].
5 Discussion

Within this chapter, I relate the findings of this thesis to previous literacy research and conceptualizations of literacies and provide insights into understanding new health information literacies as a sociocultural phenomenon (sub-chapter 5.1). Then I discuss and evaluate the methodology of this thesis (sub-chapter 5.2) and present implications for future research (sub-chapter 5.3).

5.1 Understanding new health information literacies as a sociocultural phenomenon: Potential for changing the nexus of practice

This sub-chapter discusses the potential for changing the nexus of practice addressed in this thesis – that is, understanding new health information literacies as a sociocultural phenomenon. Change within the nexus analytical research perspective relates to the overall idea of the researcher becoming a part of the research process, not as a neutral observer but as a participant who unavoidably always makes changes within the nexus of practice under investigation (Scollon & Scollon, 2004). Within this thesis work, the process of change began in the early stages of the research, when I chose the topic of the thesis, and it developed further throughout the research process. Next, the sub-chapter considers potential change in the findings of this thesis on previous conceptualizations of and empirical research on literacies (sub-chapters 5.1.1, 5.1.2 and 5.1.3). I discuss how research on different literacy concepts – namely, information literacy, new literacies, health literacy and other related concepts – can inform the understanding of new health information literacies in online, and other contemporary information environments of people. Theoretically, these ideas are rooted in a sociocultural understanding of literacies as socially enacted practices. Finally, I discuss the practical implications of this thesis for information literacies and health literacies research (sub-chapter 5.1.4).

5.1.1 Academic discourse and practices related to health literacies in online environments

In this thesis, the findings of the systematic review are considered to reflect the current academic discourses and practices related to health literacies. According to the findings, most of the reviewed studies focused on studying health literacy
among adult populations, such as patients or adults with risk factors for a certain disease, older adults or veterans, or the general public. The studies were exclusively conducted using quantitative methods in medical and health contexts. In other words, qualitative approaches and everyday settings were rare exceptions in the reviewed body of literature. The findings concerning health literacies research in online contexts are in line with previous research indicating that, overall, although the health literacy research community has shown interest in the conceptual and theoretical development of the concept, research has concentrated on the empirical examination of health literacy using quantitative methods within medical contexts (see e.g. Chinn, 2011; Guzys et al., 2015; Mancuso, 2009).

The findings suggest that there is a tendency to refer to the early definitions of health literacy concepts, thus presenting a functional understanding of the concept. Moreover, these studies tended to adopt a domain-specific or general and skills-based health literacy definition over a multidimensional one. Similar to the earlier health literacy reviews, the findings suggest that several concepts with overlapping features were used in the studies over disciplinary boundaries, and there is no clear consensus on the definitions of these concepts (see e.g. Batterham et al., 2017; Chinn, 2011; Guzys et al., 2015; Mackert et al., 2015; Sørensen, 2019; Sørensen et al., 2012; Sykes et al., 2013). Furthermore, practices, such as information creation, that can be considered relevant in online contexts specifically were not addressed in the reviewed definitions of health literacy. Instead, they focused on information seeking, evaluation and use.

A novel finding of this thesis is the way the role of information varied within the health literacy definitions. Typically, health information was portrayed as general information obtained through information seeking. Within the skills-based health literacy definitions, information was described in relation to basic skills to acquire, process and understand health information and as something to be utilized universally in decision-making situations. Within the multidimensional health literacy definitions and models attached to them, information was understood more holistically – that is, information and knowledge were gained not only through information seeking but also from prior experiences. Moreover, a critical appraisal of the found information was taken into account more thoroughly in these models. Although multidimensional conceptualizations were rare in the reviewed empirical studies, they are common within policy programs, as presented by Batterham et al. (2017) and WHO (2021), for example. In this regard, the findings indicate that the conceptualizations of health literacies seem to lack specificity regarding the
definition of information and how it differs from knowledge (see e.g. Greyson & Johnson, 2016).

According to the findings of the review, the notion of information use as part of health literacy abilities is disregarded in most of the basic health literacy definitions. Among the multidimensional definitions, information use is mentioned in some of them, but it is usually understood as applying health information when making health decisions (see e.g. Sørensen et al., 2012) or is left unexplained. Perhaps due to multidimensionality itself, it is not very common to cite these types of definitions of health literacy, as the findings of the review suggest.

Within the domain-specific definitions, such as eHealth literacy, information was described as contextual and information seeking was considered to differ when conducted in different contexts and when dealing with different types of information. The findings of the review indicate that eHealth literacy was often framed as individuals’ computational skills, placing other important aspects of literacy competencies aside. This is in line with earlier notions made on the eHealth literacy definition and the model accompanying it not fully capturing the essential competencies needed in digital environments (Bautista, 2015; Gilstad, 2014; Griebel et al., 2018). For example, Griebel et al. (2018) included communication and creation of health information in their evolved definition of eHealth literacy combining aspects of earlier definitions. However, this notion was not present in the definitions of eHealth literacy within the findings of the review. Similar to some of the multidimensional health literacy definitions, eHealth literacy stresses information seeking as the first step to becoming health literate, acknowledges critical appraisal of retrieved information and addresses information use as applying the gained knowledge to address and solve health problems (see e.g. Norman & Skinner, 2006a).

According to the findings of the review, the concept of health information literacy was cited in only a few studies, similar to the multidimensional health literacy concepts. This may be due to the origins of the concept in the field of information studies (see e.g. Hirvonen et al., 2020) and its use mainly by researcher of this field. The definition of health information literacy emphasizes the role of information (i.e. the information-seeking process) and especially individuals’ abilities to identify information needs and sources and critically assess the relevance of the retrieved information. Although the concept is seen to present a rather general view on health literacy competencies, these aspects which draw the focus to information seeking and appraisal are usually ignored in other health literacy definitions and, thus, offer a unique perspective to health literacy research.
(see e.g. Hirvonen et al., 2020). However, although the definition of health information literacy acknowledges, for example, recognition of information needs, assessment of the quality and applicability of retrieved information and its analysis, similar to other health literacy definitions, it denotes using this information as making good health decisions. There is a clear need to develop the concept further to include aspects of literacies that are essential in the contemporary information environments of people, such as social media.

The findings also suggest that there are clear inconsistencies in operationalizing health literacies. For example, studies referring to a multidimensional concept sometimes used a reading comprehension test to measure participants’ health literacy levels. Different types of measures were used and self-efficacy measures were especially common. In general, studies which framed health literacy as a multidimensional construct combined several types of measures. These findings are in line with earlier notions of the current state of health literacy measurement. For example, although the use of reading comprehension and numeracy tests has been largely criticized within the health literacy community, these measures were nevertheless used in several studies (see e.g. Frisch et al., 2012; Guzys et al., 2015; Haun et al., 2014). However, there was a detectable shift, as the review evidenced an increase in the use of self-efficacy measures to study eHealth literacy in particular (see e.g. Frisch et al., 2012; Griebel et al., 2018; Pohl et al., 2015).

Overall, the findings indicate that there is a tendency to use a simple definition of health literacy that can be effectively operationalized. However, it should be considered whether the concepts and measures reflect actual competencies and practices of people, especially beyond healthcare settings (see e.g. Chinn, 2011).

5.1.2 Everyday health information literacy practices enacted on social media

The findings of phase 2 emphasized the interconnected social, material and embodied health information literacy practices. Discourses in place, interaction order and historical bodies were considered to reflect the participants’ actions and, thus, to frame and transform the video bloggers’ health information literacy practices (see Fig. 4). The findings show that video bloggers employ several health information literacy practices during their information creation processes, including seeking, planning, organization, editing and presentation of information. The participants often employed information practices in similar ways, but unique
aspects were identified as well. For example, in line with earlier information creation studies, practices of mixing and visualizing information were common (see e.g. Hicks, 2018; Kitzie, 2019; Koh, 2013). However, information seeking served different purposes for the participants and was not central for all of them. The findings support Koh’s (2013) notion that content development, organization and presentation of information were important steps in the information creation process of teenagers actively producing and sharing information objects.

The findings highlighted embodied information practices, which were manifested through the created video. This resembles the findings by Fairbrother, Curtis and Goyder (2016) of children making meaning of health information through their own embodied experiences. According to Fairbrother et al. (2016), children may use their own embodied experiences to check or sometimes problematize the health information they interact with, that is, to assess the meaningfulness of health information for their everyday lives. Video bloggers, in this sense, have the capacity to interact with and influence their, often young, audiences by grounding their presentations on embodied experiences rather than second-hand information. A similar emphasis on embodied knowledge was found in Olsson’s studies, which discussed the performative nature of information practices; he recognized ways in which theatre professionals (Olsson, 2010a, 2010b) and archaeologists (Olsson, 2016) embodied their knowledge and manifested their abilities to gain recognition from community members. This way embodied knowledge served as a source of authority (Olsson, 2016).

Discourses about credibility of information sources and authenticity of information in general were highlighted in the findings. Especially authenticity of the presentation as whole, of the information, and of self, was emphasized. Authenticity was considered as essential for any health-related YouTube channel, and as such, this may have guided the participants’ information creation processes in general. Building trustworthiness toward their audiences by grounding on genuine and authentic presentation is considered to be a norm within social media influencers, as presented by Abidin (2015), for example. On the other hand, the credibility of information sources related to the participants’ historical bodies mirrored their previously learned information-seeking practices. This relates to the findings by Haider & Sundin (2020) of students attempts to apply similar credibility assessment practices in school settings and everyday lives. Although young people acknowledged and recognized these learned practices, they may prove too difficult to apply outside school contexts (Haider & Sundin, 2020). Overall, discourses in place – that is, discursive elements circulating throughout the social actions of
participants — had a noticeable influence on young video bloggers’ health information literacy practices during their information creation processes.

Interaction with the actual or anticipated audience was reflected in many aspects of the video bloggers’ information creation processes, including their information literacy practices, such as information seeking. For example, the role of an advisor was grounded in either experience-based or second-hand information. Thus, the findings suggest that the video bloggers’ information literacy practices were guided by the anticipated expectations of their audiences. Such relations, sometimes described as falsely intimate parasocial relations (see Horton & Wohl, 1956) with the audience, are the essence of the social media interaction order. Abidin (2015) conceptualized these relations as perceived interconnectedness and contended that unlike parasocial relations, perceived interconnectedness directs the focus to interactive and reciprocal communication between influencers and their audiences. In this vein, the influencers’ authority from the perspective of their audience should not be understood as a one-way influence but as co-constructed.

The participants’ information literacy practices appeared to be constructed, based on, influenced and guided by the historical bodies of the participants, and practices previously learned were brought to a new scene of action. All the participants had different kinds of backgrounds in making YouTube videos; while two were familiar with video blogging practices, one saw herself as a beginner, in her own words. The information literacy practices, especially information seeking, seemed to be driven by practices learned in the university or school context. However, these learned practices were embodied, built on experiences of a healthy lifestyle and manifested through the video presentation. To some extent, these findings add to previous understandings within sociocultural information literacy research showing that literacy practices are highly context-specific (see e.g. Limberg et al., 2012; Lloyd, 2010b, 2017), as they highlight the importance of previously adopted practices brought into the context. However, according to Papen (2013), context within information literacy practices may also refer to the context of the issue at hand, personal context and prior experiences. In this sense, context relates to the notion of historical body brought to every scene of action (see Scollon & Scollon, 2004). The contextuality of information practices, following these ideas, is about merging learned practices, norms, values and discourses from different contexts.
5.1.3 Theoretical contribution

The current health literacy conceptualizations do not acknowledge the multimodality of information and practices, including information creation, or the role of new technologies that are addressed within new literacies research. Furthermore, they do not reflect the variety of information practices emphasized in information literacy research. However, as noted earlier (see sub-chapter 2.3.1), health information, especially in online contexts, should be regarded as highly multimodal, consisting of not only information acquired from healthcare professionals but also information gained from various other sources, such as family and friends and social media. Moreover, health information is based on people’s embodied experiences of their own health and well-being, as exemplified by the findings of this thesis. The visuality of social media serves as a powerful platform to create and share information that is based on these embodied experiences.

Moreover, the emergence of social media and related information practices are constantly changing. New applications are developed which call for adjusting and creating new information practices. Within the new literacies perspective of Lankshear and Knobel (2011), the notion of new relates to, on one hand, new technical ‘stuff’ which emphasizes digitality and the continual growth and ongoing development of digital-electronic technologies. On the other hand, it regards new ethos ‘stuff’ – that is, the effects of these changes to our everyday social practices which are transforming and transformed by new technologies (Lankshear & Knobel, 2011). Our everyday social media practices exemplify these notions. When related to the findings of this thesis, these ideas of the new literacies perspective are highlighted; in the context of information creation on social media, people need and enact a variety of information practices that are developed within and transformed through the new technologies. These practices include, for example, information seeking online, mixing of multimodal health information constructed of embodied experiences and second-hand information, editing and visual presentation of content. All these practices can be described as echoing both the new technical ‘stuff’ and the new ethos ‘stuff’ that Lankshear and Knobel (2011) described as the core of new literacies. Moreover, attaching the notion of plurality to literacy addresses the multiplicity of information practices and how they ‘shift with contexts, texts, and the identities of people using literacy’ (Rowsell & Walsh, 2011, p. 55).

As noted in the findings of this thesis, the role of information within health literacy definitions varied, and it was most apparent in the definition of health
information literacy, a concept merging notions of health and information literacies (American Library Association, 1989). Information literacy and health information literacy both concentrate on the information-seeking process that includes the ability to recognize information needs, find relevant sources and assess the quality of the found information (Shipman et al., 2009). These are aspects of literacies which are regarded as highly relevant in our everyday information environments due to the rapid flow of information and the amount of misinformation spread especially online (Koltay, 2017). Moreover, information literacy research has focused on the evaluation of information in general but also how credibility is invested in information sources and the role of authoritative voices in this process (see e.g. Haider & Sundin, 2020; Papen, 2013; Whitworth, 2014; Wilson, 1984). These notions are highlighted in the findings of phase 2; through different information practices and grounding in both experience-based and second-hand information, the participants were able to construct their own authoritative voices in relation to their audience. This emphasizes the importance of understanding the mechanisms of authority construction not only from an authority evaluation perspective but also with a focus on people’s own authoritative positions.

The findings highlight the complexity and centrality of information creation as an information literacy practice. Specifically, the findings suggest that the information creation process is composed of several interconnected social, material and embodied information literacy practices. Similar to the new literacies perspective, recent information literacy research has, to some extent, brought the notions of information creation and embodiment to the agenda (see e.g. Hicks, 2020; Huvila et al., 2020; Koh, 2019; Lloyd, 2010b; Olsson, 2010a, 2010b). Within information literacy research, information creation is understood, for example, as the way people create messages, cues and other information content ‘that can be used to meet the existing or potential information needs of the creator or other users’ (Koh, 2013, p. 1827). Embodiment or embodied knowledge is considered a corporeal modality of information literacy; the body serves as an important source of knowing and the activities associated with it are constituted in the practice of information literacy (Lloyd, 2010b). According to Lloyd (2010b), from this perspective, ‘the focus is turned towards understanding the enactment, performance and production of knowledge and how these activities take place or “happen” as situated action within a collective practice’. These notions are specifically important in regard to health and well-being and, accordingly, must be taken into account within the conceptual development of health information literacies and overall in information literacy research.
As noted earlier, the conceptual development of health literacy has been driven by interest in perspectives on healthcare and public health and measurements of health literacy (see e.g. Chinn, 2011; Guzys et al., 2015; Mancuso, 2009; Mårtensson & Hensig, 2012; Pleasant & Kuruvilla, 2008). This differs from the sociocultural perspective on literacies emergent within the new literacies and information literacy research fields. However, an important asset of health literacy research is that it calls attention to the significance of health and well-being and health information in our everyday lives. For that reason, research on health literacies and their definitions and operationalization for measurement have value as such. That being said, there is a clear need to determine what health and well-being and health information mean in general, in specific contexts and in relation to health literacies. The multimodal definitions and models, in particular, provide valuable notions regarding new health information literacies. The notions of lifelong learning and the impact of prior experiences on developing health literacy competencies (see e.g. Sørensen et al., 2012; Zarcadoolas et al., 2006) are especially important factors regarding information practices; as the findings suggest, prior experiences – that is, people’s historical bodies – influence how information practices are enacted in different settings. Moreover, the recent conceptualizations of health literacies as a social practice by Samerski (2019) and Fairbrother et al. (2016) should be considered important steps towards a more sociocultural understanding of the concept.
Fig. 5. New health information literacies drawing from other literacy concepts and nexus analysis

Following these notions drawn from research on different literacy concepts – namely, information literacy, new literacies and health literacies (see Fig. 5) – I suggest that new health information literacies as a sociocultural phenomenon concern ways of knowing (see e.g. Lloyd, 2017) about health and well-being – that is, information practices related to seeking, finding, evaluating, understanding and creating health information that are enacted in the social settings and everyday environments of people, including online contexts. Moreover, new health information literacies ought to be understood as

- socially created, constructed and enacted within people’s everyday actions
- being continually transformed by and transforming new technologies
composed of several interconnected social, material and embodied information literacy practices
- mediated through multimodal informational content
- developed and contested throughout people’s lifetimes
- affected by both broad and context-specific discourses taking their form in the interaction between participants
- connected to ways authority is constructed and invested within different practices

These notions can be considered in research focusing on further development of health information literacies from a sociocultural perspective. They are not intended to be used as a specific definition of the concept but, rather, to inspire further elaborations.

5.1.4 Practical implications

The practical contribution of this study relates to increased understanding of health information literacies in online contexts, specifically of young people’s health-related information literacy practices on social media. The findings of this study may be of interest to practitioners involved in health promotion or education or information literacy instruction, specifically if the aim is to consider (health) information literacy practices relevant in everyday life.

Health education or promotion could benefit from the findings of this thesis, specifically by considering how information is approached, framed or understood in their current instructional or promotional activities. For example, this may imply whether health literacy is understood as individual skills for obtaining general health information through information seeking or more holistically as socially constructed practices enacted in people’s everyday social realities (see e.g. Samerski, 2019). The latter approach can help in mapping learners’ accounts of health and well-being and enable them to reflect their information practices in their own everyday information environments.

For information literacy instruction included in health educational activities, it could be especially fruitful to include information creation in practical learning tasks. These tasks could include creating content constructed of different information types, grounded in first-hand, experience-based knowledge and second-hand knowledge. The learning tasks could include a discussion of different information practices enacted in these tasks, such as how they are perhaps
embedded in learners’ everyday activities, if there are learned practices brought to the scene of action and if the learners acknowledge related discourses circulating through the scene in which the tasks are undertaken. Moreover, the learners could be guided to acknowledge, recognize and contest the authoritative voices invested in different information used and created in these tasks. These include recognition of the learners’ own authority and possible bias. The tasks could prove especially advantageous if conducted in actual online contexts, such as on social media. Overall, it is important to consider the actual information practices of people seeking, finding, evaluating, understanding and creating health information in their social settings and everyday environments, including online contexts.

5.2 Evaluation of the methodology

This thesis constructed of two research phases in which I used several different methods to investigate health information literacies in online environments and has employed nexus analysis as a theoretical-methodological lens through which to consider the two phases. As a whole, the thesis is qualitatively driven by employing, in phase 1, a systematic review with an interpretive perspective and, in phase 2, an ethnographic approach including interviews and video diaries.

There has been an ongoing debate over what is the quality of qualitative research (Morse, 2018). The traditional criteria for assessing the methodological validity of scientific research were formulated from within the positivist perspective on doing social science research with quantitative methods (Altheide & Johnson, 1994; Corbin & Strauss, 2008; Morse, 2018). Guba and Lincoln’s (1985) seminal study was one of the first to present criteria for the validity and reliability of qualitative inquiry, especially focusing on how to establish trustworthiness by assuring the credibility, transferability, dependability and confirmability of the research process. However, this perspective has been argued to disregard that ‘quality’ is a rather elusive phenomenon and, therefore, ‘validity’ and ‘reliability’ do not adequately encapsulate the variety of issues relating to it (Seale, 1999). For example, researchers should, rather than simply following a strict methodological scheme to carry out their research, engage in philosophical and methodological debate that could develop methodological awareness and inform practical conduct of the research (Seale, 1999).

Therefore, recent approaches aimed at validating qualitative research have focused on overall appraisal of the completed research – that is, the rigour in qualitative inquiry as presented by Morse (2018) and Tracy (2010), for example.
Before evaluating the rigour of qualitative research, the researcher should determine what types of data are included in the study. Morse (2018) divided these into hard data, considered to present facts, such as demographic or other numeric data, and soft data, which is interpretive and describes experiences. Validation and verification of research consisting of both descriptive and interpretive data appropriates the use of validation and/or verification strategies to evaluate the rigour of the research – validation of hard descriptive data and verification of soft interpretive data. Next, following the criteria presented by Morse (2018), I present the strategies of validation and verification employed in the research process of this thesis.

The data of this thesis are descriptive and interpretive. The systematic review data in phase 1 – the data presenting the selected studies and their characteristics – can be described as descriptive in nature. For validating this type of data, Morse (2018) suggests ‘quantitizing’ – that is, categorizing and coding the data – and using interrater reliability to ensure that there is agreement on the content and categorization of the data. Within this thesis, validation of the systematic review data was conducted by using PRISMA (Moher et al., 2009), which was considered appropriate for improving the transparency of the systematic review as a whole by providing clear guidelines including a checklist and a flow diagram (Moher et al., 2009). Moreover, interrater agreement of the study selection was conducted by the second author (Studies I and II), resulting in a 93% agreement rate.

According to Morse (2018), verification of interpretive data can be done through member checking, seeking saturation in the analysis process, peer reviewing (also peer debriefing; see Lincoln & Guba, 1985) and audit trails – that is, documenting the research process. Within this thesis, three of these strategies were employed thoroughly to verify the interpretive data consisting of interview, video diary and YouTube data. Data saturation is considered to ‘link similar concepts and processes in different instances, experiences, contexts and events’ (Morse, 2018, p. 812). In this thesis, I used nexus analysis as a theoretical-methodological perspective to guide the data analysis and provide a conceptual framework to mirror the findings. This, I consider, served as an effective way to ensure saturation within the analysis, as presented by Morse (2018). To peer review my research, I regularly attended research community meetings and data sessions where I could discuss data collection, data interpretation and the findings. Audit trails are considered useful especially for conceptual management of interpretive data (Morse, 2018). My research process included making notes and writing
articles as an iterative process, which served me as a documentation of the research process.

In addition to these validation and verification strategies, I employed other evaluation criteria, such as data triangulation and thick description of data (see e.g. Lincoln & Guba, 1985). Most commonly, the application of triangulation in qualitative research is conducted by using multiple methods (Silverman, 2011), which was the case in this thesis. By conducting semi-structured interviews and using video diaries and YouTube videos created by the participants in phase 2, I could draw similar conclusions from these different data and, therefore, validate the findings of the study (see Moisander & Valtonen, 2006). Moreover, acknowledging the researcher’s perspective (Corbin & Strauss, 2015; Gray, 2004) enables a critical examination of possible bias within the research process. As Scollon and Scollon (2004) argued, a researcher employing nexus analytical, or any other, methodology is not in a privileged position to bring about change within the nexus of practice under investigation. Thus, the researcher is not considered a neutral observer but an active part of the research process. Within this thesis process, I considered these notions carefully and tried to acknowledge my subjectivity throughout the study process. For example, my own thoughts, actions and positioning are likely to have influenced the actions and utterances of the study participants.

In this thesis, nexus analysis served as an important way to discover not only discursive descriptions of the information creation process but also how discourses, interaction order and historical bodies of participants enabled the action under study. Employing these elements through the research process and the combination of different data allowed for a richer investigation of different phases of the information creation process and its end result. As the study was limited to three participants, these findings should not be considered to provide a generalized presentation of the phenomena beyond this limited context. Moreover, as noted in sub-chapter 3.3.2, participant recruitment was conducted by contacting the individual video bloggers, aged 15–24 years old, by e-mail and private messages on social media. Young video bloggers, who wanted to participate, all appeared enthusiastic to take part in scientific research and were interested in health topics in general. These aspects had implications for the overall findings and outcome of this thesis.

Overall, I consider the research process of this thesis an important way to learn about scientific inquiry. If there was something that I would have done differently, it would relate to the planning of the research. It would have been more efficient
and time-saving to write only one systematic review article instead of two and move straight to phase 2. This might have enabled a more thorough investigation of the everyday health information literacies on social media, including, for example, more research participants and a more comprehensive set of ethnographic research methods to gain a deeper understanding of the phenomenon. In addition, including participatory research methods (see e.g. Bradbury-Jones & Taylor, 2015; Kilpatrick et al., 2007), such as peer-to-peer interviews, would have involved the young participants as active agents in the research process and, thus, supported their sense of agency, considered a resource in its own right (see e.g. Kulmala & Fomina, 2021).

5.3 Future research

Future research should focus on conceptual development and empirical research on new health information literacies. The recent information literacy research has focused on sociocultural perspectives of literacies as socially enacted practices (see e.g. Lloyd, 2005, 2010a, 2011, 2017; Lloyd & Somerville, 2006; Lloyd-Zantiottis, 2010) and on embodiment and information creation as well (see e.g. Hicks, 2020; Huvila et al., 2020; Kitzie, 2019; Lloyd, 2010b; Olsson, 2010a, 2010b). However, more research is needed within both perspectives and especially on the information practices enacted in the everyday contexts of people, of which the online context is an essential part. Specifically, research on information literacies ought to investigate how authority is invested and constructed through information creation in online contexts. For example, studying how social media influencers construct their authoritative voices on their varied social media platforms may provide understanding of the contemporary information practices of this group which is considered to offer indications, for example, of the health information behaviours and practices of young people (see e.g. Abidin, 2015; Balabanis & Chatzopoulou, 2019; Vaterlaus et al., 2014). This type of information literacy research could include aspects of new literacies research which highlight the multimodality of informational content and the emergence and effects of the new technologies in our everyday social practices (see e.g. Lankshear & Knobel, 2011). Furthermore, employing a nexus analytical toolkit in the examination could provide a deeper understanding of how discourses, interaction order and the historicity of people are perhaps embedded in everyday information practices.

For both information literacy and health literacies research, this thesis could provide insight into the practical research conduct. For example, qualitative methods including ethnography or participatory approaches may be valuable in this
task. By employing methods such as interviews, observation and ethnography, studies may gain a deeper understanding of how people actively construct meaning from (health) information through their own embodied experiences (Fairbrother et al., 2016). Researchers seeking to employ such approaches may consider the benefits of nexus analysis. In this study, nexus analysis provided a way to investigate both the information practices that the young video bloggers employed and the different elements in their everyday lives that were embedded in the processes of information creation. This way, the study informed our understanding of the health-related information literacy practices of these young people in ‘real-life’ situations, in contrast to merely presenting their self-reported health literacy skills (see e.g. Chinn, 2011). The value of nexus analysis is understood to lie within its unique way of combining elements of various approaches and the practical guidelines it offers for multimodal analysis. In particular, nexus analysis draws the focus towards individuals’ unique experiences, learned practices and understandings – the historical body – as an important element of social action. This study is among the first to employ nexus analysis in information literacy research or the field of information studies.

Overall, the conceptual development of health literacies is warranted and researchers should be encouraged to provide a clear description of the operationalization of concepts they use to ensure transparency in reporting. In addition to conceptual development, Haun et al. (2014) suggested that researchers aiming to develop new health literacy measurements should include a full range of conceptual dimensions of health literacy in the measure and use a more representative sample of the target population to administrate ‘a more refined and flexible approach to research in this field’ (p. 303). However, Chinn (2011) and Samerski (2019) proposed using a qualitative approach to study health literacy, which can direct the focus towards the aspects of health information with which people actually interact in real-life situations.

I do not suggest that all health literacies or health information literacies research should adopt qualitative methods but, rather, that it should aspire to draw attention to other ways of investigating competencies, skills and practices related to literacies regarding health and health information. Although the use of mixed methods is encouraged and there is an increasing trend towards it (see e.g. Diviani et al., 2016; McCormack et al., 2013), only a few of the reviewed health literacies studies mixed qualitative and quantitative methods. The benefits of mixing methods are seen to lie with capturing different aspects of human thought, such as values and attitudes that would not emerge when using only less interactive research
methods, such as a questionnaire (Diviani et al., 2016). Moreover, including a mixed-methods perspective may provide deeper insight into the small-scale and large-scale discourses circulating around the research topic, as suggested by the findings of this thesis. For example, this might be done by first conducting a questionnaire within a sample population to map the discourses around the topic as well as self-reported health literacy competencies and practices, and then employing ethnography to study the social actions and practices of a smaller set of participants. However, before methodological development, current health literacy research should concentrate on the conceptual development of health literacy and related concepts.

That said, the development should start with defining what is meant by health and well-being and health information in general and in different contexts, such as online. Following Quennerstedt (2010, 2018), I suggest that the health literacy community should re-examine the scientifically normative view on health as an absence of disease and as a static condition that is achievable through avoiding diseases or risks of diseases. It could be more valuable to view health as a combination of material and perceived well-being (see sub-chapter 2.3.1) including, for example, physical, social, political, spiritual, religious and economic resources, but also actions, diseases and environmental factors (Quennerstedt, 2018). This kind of sociocultural view on health and health information draws attention to the complexity of human well-being, constructed of bodily experiences and second-hand information, for example. Napier et al. (2014) noted that there is no single universal definition of health that can describe the entirety of the phenomenon and apply to everyone. Therefore, health, health information and health literacies ‘should not merely be defined by measures of clinical care and disease’ (Napier et al., 2014, p. 1; Samerski, 2019).
6 Conclusion

This study aimed at increasing the understanding of new health information literacies as a sociocultural phenomenon. By investigating health information literacies both as theoretical constructions and as practices enacted in everyday online information environments, this thesis provides novel knowledge of the variety of health information practices enacted in the everyday social environments of people.

The findings of phase 1 indicate that there is a need for conceptual and empirical development of health literacies in online environments. They suggest that within current research, there is a tendency to understand health literacies as individual-level skills and a focus on the process of information seeking to resolve health problems. Within this body of research, health information is portrayed as general information obtained through information seeking or more holistically, including people’s prior experiences. However, this research did not take into account the ways that new technologies transform our information literacy practices or the multimodality of informational content shared and created online. The findings of phase 2 exemplify the complexity and centrality of information creation on social media, which is composed of several interconnected social, material and embodied health information literacy practices. Specifically, health information literacy practices constructed and enacted through embodied knowledge and authenticity of the presentation of information and of the self were emphasized. By highlighting the importance of previously adopted practices, these findings contribute to sociocultural information literacy research that typically emphasizes the context-specificity of information literacy practices. Moreover, the findings suggest that through different information literacy practices and grounding in both experience-based and second-hand information, authoritative voices can be constructed in relation to different audiences. This emphasizes the importance of understanding authority construction as part of health information literacies not only from an authority evaluation perspective but with a focus on people’s own authoritative positions.

The thesis is among the first studies to employ nexus analysis in information literacy research or the field of information studies. The nexus analytical approach provided an effective way to engage with and encounter discrepancies in the academic discourses and practices of the health literacy research community and the everyday discourses and practices of health information literacies enacted on social media. There is a continued need for research aimed at understanding health
information literacies as everyday practices that are socially constructed, material and embodied. These practices are transformed by and transform new technologies and involve multimodal information. This thesis adds to our knowledge of information literacy practices in creating health information on social media. Therefore, the practical contribution of this thesis relates foremost to this improved understanding of our everyday lives in a digitalized society. The findings may be of interest to practitioners involved in health promotion or education or information literacy instruction, specifically if the aim is to consider health information literacy practices relevant in everyday life. In future research, it would be valuable to consider new health information literacies as ways of knowing about health and well-being. This can be done by employing nexus analysis to examine information practices affected by macro- and micro-level discourses, interactions between people and their accumulated experiences and understandings.
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Appendices

Appendix 1. Search strategy
Appendix 2. Characteristics of the included studies
Appendix 3. Description of health literacy concepts and definitions in the included articles
Appendix 4. Interview questions
Appendix 5. Guiding questions for analysis
Appendix 1. Search strategy

Online OR internet OR digital OR web OR "social media" OR SNS* OR "social networking site*" OR "social networking service*" OR facebook OR twitter OR youtube OR instagram OR snapchat OR periscope

AND

health* OR wellbeing OR well-being OR wellness OR disease OR health OR e-health OR ehealth

AND

literacy OR literacies OR comprehend* OR "abilit* N2 (read* OR search* OR seek* OR writ* OR evaluat* OR assess*)" OR "comprehen* N2 read*" OR "skill* N2 (read* OR search* OR seek* OR writ* OR evaluat* OR assess*)" OR competenc* OR "health knowledge" OR numeracy
### Appendix 2. Characteristics of the included studies

<table>
<thead>
<tr>
<th>Study and year</th>
<th>Research area</th>
<th>Method of data collection to study health literacy</th>
<th>Method of data analysis</th>
<th>Sample and target population</th>
<th>Health literacy concept used (main concept first), defined by</th>
<th>Tool used to assess health literacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree et al, 2015</td>
<td>Sociology</td>
<td>Questionnaire survey</td>
<td>Quantitative</td>
<td>346 adults over 35 years</td>
<td>Health literacy by Ratzan and Parker</td>
<td>REALM⁷</td>
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<tr>
<td>Allam et al, 2015</td>
<td>Communication</td>
<td>Questionnaire survey, performance tests</td>
<td>Quantitative</td>
<td>39 marketing students + 197 adults</td>
<td>Health literacy by Schulz and Nakamoto</td>
<td>knowledge test (vaccination)</td>
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<td>Austvoll-Dahlgren et al, 2012</td>
<td>Health sciences</td>
<td>Questionnaire survey, task data</td>
<td>Quantitative</td>
<td>96 parents</td>
<td>Health literacy by Nutbeam; Zarcadoolas et al.</td>
<td>Search tasks and DISCERN², TPB³, PAM⁴</td>
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<td>Bailey et al, 2015</td>
<td>Pharmacy</td>
<td>Questionnaire survey</td>
<td>Quantitative</td>
<td>1077 patients</td>
<td>Health literacy by Ratzan and Parker</td>
<td>NVS⁵</td>
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<tr>
<td>Bickmore et al, 2016</td>
<td>Computer and information science</td>
<td>Questionnaire survey</td>
<td>Quantitative</td>
<td>89 participants with low HL and computer literacy</td>
<td>Health literacy by Ratzan and Parker</td>
<td>REALM⁷</td>
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<td>Blackstock et al, 2016</td>
<td>Medicine</td>
<td>Interviews</td>
<td>Quantitative</td>
<td>63 women with HIV</td>
<td>eHealth literacy by Norman and Skinner</td>
<td>eHEALS⁸</td>
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<tr>
<td>Chan et al, 2011</td>
<td>Biomedical informatics</td>
<td>Performance tasks, audio-recordings</td>
<td>Mixed</td>
<td>1 user in pilot phase, 20 users in testing</td>
<td>eHealth literacy by Norman and Skinner</td>
<td>Cognitive task analysis + performance tasks</td>
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<td>Chang et al, 2015</td>
<td>Health education</td>
<td>Questionnaire survey</td>
<td>Quantitative</td>
<td>1869 students and 1365 parents</td>
<td>eHealth literacy by Norman and Skinner</td>
<td>eHEALS⁵, EHIL⁷</td>
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<td>Chisolm et al, 2011</td>
<td>Medicine</td>
<td>Questionnaire survey</td>
<td>Quantitative</td>
<td>180 adolescents</td>
<td>Health literacy by Ratzan and Parker</td>
<td>TOFHLA⁸</td>
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<td>Domain</td>
<td>Methodology</td>
<td>Sample Description</td>
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<td>Choi et al, 2013</td>
<td>Gerontology</td>
<td>Questionnaire survey</td>
<td>Quantitative 270 under 60 yrs, 763 over 60 yrs</td>
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<td>Quantitative, 2680 Hispanic adults</td>
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<td>One-item screening instrument by Chew et al</td>
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<td>31 questions; understanding of mental health concepts and application of skills</td>
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<td>Treatment depression literacy; knowledge based</td>
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<td>Questionnaire survey</td>
<td>Mixed, 48 older adults</td>
<td>eHealth literacy by Norman and Skinner</td>
<td>eHEALS⁶ (adapted)</td>
<td></td>
</tr>
<tr>
<td>Manafò et al, 2013</td>
<td>Nutrition Science</td>
<td>Questionnaire survey</td>
<td>Quantitative, 67 older adults</td>
<td>eHealth literacy by Norman and Skinner</td>
<td>eHEALS⁶; eSEARCH 14</td>
<td></td>
</tr>
<tr>
<td>Marshall, et al, 2012</td>
<td>Information Science</td>
<td>Questionnaire survey, workshops, interviews</td>
<td>Qualitative, 385 answered to survey, 39 participated in the workshop, 18 interviewed</td>
<td>Health literacy by Nutbeam</td>
<td>Qualitative assessment of information literacy regarding health</td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>Field</td>
<td>Questionnaire Type</td>
<td>Research Question</td>
<td>Health Literacy Tool</td>
<td>Other Notes</td>
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<tr>
<td>Mayberry et al, 2011</td>
<td>Medicine</td>
<td>Questionnaire</td>
<td>Quantitative 61 adults with type 2 diabetes</td>
<td>Health literacy by Ratzan and Parker</td>
<td>Three-item HL screening instrument by Chew (modified)</td>
<td></td>
</tr>
<tr>
<td>McCleary-Jones et al, 2013</td>
<td>Nursing</td>
<td>Questionnaire</td>
<td>Quantitative 88 African-American adults</td>
<td>Health literacy by Ratzan and Parker; the American Medical Association</td>
<td>SILS15</td>
<td></td>
</tr>
<tr>
<td>Meppelink et al, 2015</td>
<td>Communication</td>
<td>Questionnaire</td>
<td>Quantitative 61 participants with low or limited HL</td>
<td>Health literacy by Berkman et al.</td>
<td>Short Assessment of Health Literacy in Dutch (SAHL-D)</td>
<td></td>
</tr>
<tr>
<td>Mine et al, 2015</td>
<td>Medicine</td>
<td>Questionnaire</td>
<td>Quantitative 83 cancer patients</td>
<td>eHealth literacy by Norman and Skinner</td>
<td>eHEALS6</td>
<td></td>
</tr>
<tr>
<td>Mitsutake et al, 2012</td>
<td>Health and Behavioral</td>
<td>Questionnaire</td>
<td>Quantitative 2970 Japanese adults</td>
<td>eHealth literacy by Norman and Skinner</td>
<td>eHEALS6 (Japanese version)</td>
<td></td>
</tr>
<tr>
<td>Nahm et al, 2012</td>
<td>Nursing</td>
<td>Questionnaire</td>
<td>Quantitative 27 caregiver-care receiver dyads (pair)</td>
<td>eHealth literacy by Norman and Skinner</td>
<td>eHEALS6</td>
<td></td>
</tr>
<tr>
<td>Neter et al, 2012</td>
<td>Behavioral sciences</td>
<td>Questionnaire</td>
<td>Quantitative 4286 Israeli adults</td>
<td>eHealth literacy by Norman and Skinner</td>
<td>eHEALS6</td>
<td></td>
</tr>
<tr>
<td>Ossebaard et al, 2012</td>
<td>Public health</td>
<td>Questionnaire</td>
<td>Quantitative 21 patients</td>
<td>eHealth literacy by Norman and Skinner</td>
<td>eHEALS6 (Dutch version)</td>
<td></td>
</tr>
<tr>
<td>Paek et al, 2012</td>
<td>Advertising and public</td>
<td>Questionnaire</td>
<td>Quantitative 182 students</td>
<td>eHealth literacy by Norman and Skinner</td>
<td>eHEALS6</td>
<td></td>
</tr>
<tr>
<td>Park et al, 2016</td>
<td>Nursing</td>
<td>Questionnaire</td>
<td>Quantitative 108 library users</td>
<td>eHealth literacy by Norman and Skinner</td>
<td>eHEALS6</td>
<td></td>
</tr>
<tr>
<td>Study Authors, Year</td>
<td>Field of Study</td>
<td>Research Design</td>
<td>Sample Size</td>
<td>Health Literacy Measure</td>
<td>eHealth Literacy Measure</td>
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<tr>
<td>Park et al, 2016</td>
<td>Nursing</td>
<td>Questionnaire survey</td>
<td>Quantitative</td>
<td>108 adults</td>
<td>eHealth literacy by Norman and Skinner</td>
<td>eHEALS⁶</td>
</tr>
<tr>
<td>Reininger et al, 2013</td>
<td>Health promotion and behavioral sciences</td>
<td>Questionnaire survey</td>
<td>Quantitative</td>
<td>71 adults at risk for diabetes</td>
<td>eHealth literacy by Norman and Skinner</td>
<td>TOFHLA⁶, diabetes knowledge</td>
</tr>
<tr>
<td>Rowsele et al, 2015</td>
<td>Psychology, medicine</td>
<td>Questionnaire survey</td>
<td>Quantitative</td>
<td>64 adults</td>
<td>Health literacy by Nutbeam ; Sørensen et al.</td>
<td>One-item screening instrument by Chew et al + HLS-EU-16⁶</td>
</tr>
<tr>
<td>Sheng et al, 2013</td>
<td>Psychology</td>
<td>Questionnaire survey</td>
<td>Quantitative</td>
<td>771 adults</td>
<td>eHealth literacy by Norman and Skinner</td>
<td>eHEALS⁶</td>
</tr>
<tr>
<td>Smith et al, 2015</td>
<td>Medicine</td>
<td>Questionnaire survey</td>
<td>Quantitative</td>
<td>534 adults</td>
<td>Health literacy by Ratzan and Parker</td>
<td>NVS⁷</td>
</tr>
<tr>
<td>Subramaniam et al, 2015</td>
<td>Information studies</td>
<td>Questionnaire survey, observation, interviews, focus groups, web portal data</td>
<td>Mixed</td>
<td>30 students</td>
<td>Health literacy by Sørensen et al.; Zarcadoolas, Pleasant and Greer; National Network of Libraries of Medicine; the American Medical Association</td>
<td>Health literacy skills inventory (a literature based design)</td>
</tr>
<tr>
<td>Sun et al, 2013</td>
<td>Social medicine and health education</td>
<td>Questionnaire survey</td>
<td>Quantitative</td>
<td>3222 participants</td>
<td>Health literacy by Ratzan and Parker; Berkman et al</td>
<td>A skills-based HL instrument regarding infectious respiratory diseases (Sun)</td>
</tr>
<tr>
<td>Tam et al, 2015</td>
<td>Medicine (dentistry)</td>
<td>Questionnaire survey</td>
<td>Quantitative</td>
<td>100 adults</td>
<td>Health literacy by Sørensen et al.; Ratzan and Parker</td>
<td>eHealth literacy by Norman and Skinner</td>
</tr>
<tr>
<td>Study</td>
<td>Research Field</td>
<td>Methodology</td>
<td>Sample Size</td>
<td>Measures of Literacy</td>
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<tr>
<td>Taylor-Rodgers et al., 2015</td>
<td>Psychology Questionnaire</td>
<td>Survey</td>
<td>56 young adults</td>
<td>Mental health literacy by Jorm et al.</td>
<td></td>
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</tr>
<tr>
<td>Tennant et al., 2015</td>
<td>Health education and promotion</td>
<td>Questionnaire survey</td>
<td>283 baby boomers and older adults</td>
<td>eHealth literacy by Norman and Skinner; Health literacy by Ratzan and Parker</td>
<td></td>
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</tr>
<tr>
<td>Tse et al., 2015</td>
<td>Health education</td>
<td>Questionnaire survey</td>
<td>22 adolescents</td>
<td>Oral health literacy by the U.S. Department of Health and Human Services</td>
<td></td>
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</tr>
<tr>
<td>van der Vaart et al., 2011</td>
<td>Health education</td>
<td>Questionnaire survey</td>
<td>189 patients with rheumatic diseases (study 1), 88 Dutch adults (study 2)</td>
<td>eHealth literacy by Norman and Skinner; Health literacy by Baker</td>
<td></td>
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</tr>
<tr>
<td>van der Vaart et al., 2013</td>
<td>Performance tasks</td>
<td>Mixed</td>
<td>15 + 16 patients</td>
<td>eHealth literacy by Norman and Skinner; eHealth literacy 2.0 by Norman</td>
<td></td>
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</tr>
<tr>
<td>van der Vaart et al., 2013</td>
<td>Performance tasks</td>
<td>Mixed</td>
<td>227 patients</td>
<td>Health literacy by Baker</td>
<td></td>
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</tr>
<tr>
<td>Wenhong et al., 2015</td>
<td>Communication survey</td>
<td>Quantitative</td>
<td>540 students</td>
<td>eHealth literacy by Norman and Skinner; Health literacy Berkman et al.</td>
<td></td>
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</tr>
<tr>
<td>Woods et al., 2016</td>
<td>Psychology</td>
<td>Questionnaire survey</td>
<td>46 participants with HIV-infection</td>
<td>eHealth literacy by The Patient Protection and Affordable Care Act; REALM 1, HIV Knowledge 18, Expanded Numeracy Scale, Short Assessment of Health Literacy, TOFHLA, NVS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xie, 2011</td>
<td>Information studies</td>
<td>Questionnaire survey</td>
<td>172 older adults</td>
<td>eHealth literacy by Norman and Skinner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>Study Type</td>
<td>Study Design</td>
<td>Sample Size</td>
<td>Measures</td>
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<tr>
<td>2012</td>
<td>Information studies</td>
<td>Questionnaire survey</td>
<td>218 older adults</td>
<td>eHealth literacy by Norman and Skinner, Health literacy by Ratzan and Parker, Computer Anxiety Scale; Attitudes Toward Computers Questionnaire (Efficacy and interest subscales); Computer and Web knowledge tests; Questionnaire of the “satisfaction with the training and changes in participation in one’s own health care”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>Information studies</td>
<td>Questionnaire survey</td>
<td>156 older adults</td>
<td>eHealth literacy by Norman and Skinner, Health literacy by Ratzan and Parker</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1Rapid Estimate of Adult Literacy in Medicine, 2DISCERN: an instrument for judging the quality of written consumer health information on treatment choices, 3Theory of Planned Behavior, 4Patient Activation Measure, 5Newest Vital Sign, 6eHealth Literacy Scale, 7Everyday Health Information Literacy Screening Tool, 8Test for Functional Health Literacy in Adults, 9Functional, Communicative and Critical Health Literacy Scale, 10Short Test for Functional Health Literacy in Adults, 11Brief Health Literacy Screening Tool, 12Health Literacy Scale, 13Health Information National Trends Survey, 14eSEARCH eHealth Literacy Tool, 15Single Item Literacy Screener, 16Health Literacy Survey – Europe – 16 Questions, 17Rapid Estimate of Adult Literacy in Medicine and Dentistry, 18Anxiety Literacy Questionnaire, 19Depression Literacy Questionnaire, 20Rapid Estimate of Adult Literacy in Dentistry
### Appendix 3. Description of health literacy concepts and definitions in the included articles

<table>
<thead>
<tr>
<th>Thematic category and concept</th>
<th>Defined by, year</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>General and skills-based</td>
<td></td>
<td></td>
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<tr>
<td>Health literacy</td>
<td>Nutbeam, 1998</td>
<td>&quot;[T]he cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health.&quot;</td>
</tr>
<tr>
<td></td>
<td>American Medical Association, 1999</td>
<td>&quot;[C]onstellation of skills, including the ability to perform basic reading and numerical tasks required to function in the health care environment.&quot;</td>
</tr>
<tr>
<td></td>
<td>Ratzan &amp; Parker, 2000</td>
<td>&quot;[T]he degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions.&quot;</td>
</tr>
<tr>
<td></td>
<td>Australian Bureau of Statistics, 2006</td>
<td>&quot;[T]he knowledge and skills required to understand and use information relating to health issues such as drugs and alcohol, disease prevention and treatment, safety and accident prevention, first aid, emergencies, and staying healthy.&quot;</td>
</tr>
<tr>
<td></td>
<td>Rootman and Gordon-El-Bihbety, 2006</td>
<td>&quot;The ability to access, understand, evaluate and communicate information as a way to promote, maintain and improve health in a variety of settings across the life-course.&quot;</td>
</tr>
<tr>
<td></td>
<td>Berkman, Davis &amp; McCormack, 2010</td>
<td>&quot;The degree to which individuals can obtain, process, understand, and communicate about health-related information needed to make informed health decisions.&quot;</td>
</tr>
<tr>
<td></td>
<td>The Patient Protection and Affordable Care Act, 2010</td>
<td>&quot;The term 'health literacy' means the degree to which an individual has the capacity to obtain, communicate, process, and understand health information and services in order to make appropriate health decisions.&quot;</td>
</tr>
<tr>
<td></td>
<td>National Network of Libraries of Medicine, 2013</td>
<td>&quot;Health literacy requires a complex group of reading, listening, analytical, and decision-making skills, as well as the ability to apply these skills to health situations.&quot;</td>
</tr>
<tr>
<td>Health information literacy</td>
<td>Shipman, Kurtz-Rosel &amp; Funk, 2009</td>
<td>&quot;[T]he set of abilities needed to: recognize a health information need; identify likely information sources and use them to retrieve relevant information; assess the quality of the information and its applicability to a specific situation; and analyze, understand, and use the information to make good health decisions.&quot;</td>
</tr>
<tr>
<td>Multidimensional</td>
<td>Health literacy</td>
<td>Nutbeam, 2000</td>
</tr>
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<td>--------------------</td>
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<tr>
<td></td>
<td>Baker, 2006</td>
<td>Conceptual model of the relationship between individual capacities, health-related print and oral literacy, and health outcomes: Two subdomains: 1) reading fluency and prior knowledge (vocabulary and conceptual knowledge of health and health care) 2) health literacy (health related print and oral literacy). Other factors that influence: Culture and norms, barriers to change.</td>
</tr>
<tr>
<td></td>
<td>Zarcadoolas, Pleasant &amp; Greer, 2006</td>
<td>“… wide range of skills and competencies that people develop over their lifetimes to seek out, comprehend, evaluate, and use health information and concepts to make informed choices, reduce health risks, and increase quality of life.”</td>
</tr>
<tr>
<td></td>
<td>Nutbeam, 2008</td>
<td>Conceptual model of health literacy as an asset: “It commences with recognition of prior knowledge and capability, leading to tailored health education and communication. -- People who have better developed health literacy will thus have skills and capabilities that enable them to engage in a range of health enhancing actions including personal behaviours, as well as social actions for health and the capability of influencing others towards healthy decisions such as quitting smoking, or participating in preventative screening programs.”</td>
</tr>
<tr>
<td></td>
<td>Sørensen, Van der Broucke, Fullam, Doyle, Pelikan, Slonska and Brand, 2012</td>
<td>“Health literacy is linked to literacy and entails people’s knowledge, motivation and competences to access, understand, appraise, and apply health information in order to make judgments and take decisions in everyday life concerning healthcare, disease prevention and health promotion to maintain or improve quality of life during the life course.”</td>
</tr>
<tr>
<td>Domain-specific</td>
<td>eHealth literacy</td>
<td>Norman and Skinner, 2006</td>
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<tr>
<td>Source</td>
<td>Definition</td>
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<td>Bodie and Dutta, 2008</td>
<td>“Thus, high eHealth literacy is not just the ability to use the Internet to find answers to health-related questions (e.g., devise appropriate search strategies, find information on poorly mapped sites); it also entails the ability to understand the information found (e.g., What does it mean? What does it mean for me?), evaluate the veracity of this information (e.g., Can I trust this source? Does the information found from multiple sites conflict or agree?), discern the quality of different health Web sites (e.g., Is this site sponsored by associations with potential conflicts of interest?), and use quality information to make informed decisions about health.”</td>
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</tbody>
</table>
| eHealth literacy 2.0.                       | “Items could be developed that consider skills and tasks like:  
  • confidence in expressing oneself clearly in social interactions online  
  • ability to synthesize professional and non-professional advice  
  • comfort and skill in navigating through information obtained through a mobile device  
  • ability to use apomediaries to filter relevant and trustworthy information” |
| Mental health literacy                      | “[K]nowledge and beliefs about mental disorders which aid their recognition, management or prevention”. “Mental health literacy includes the ability to recognise specific disorders; knowing how to seek mental health information; knowledge of risk factors and causes, of self-treatments, and of professional help available; and attitudes that promote recognition and appropriate help-seeking.” |
| Oral health literacy                        | “Based on the definition of health literacy, the degree to which individuals have the capacity to obtain, process, and understand basic oral and craniofacial health information and services needed to make appropriate health decisions.” |
| “Bad” health literacy                       | “[I]n the context of false or misleading health information, we speak of bad (or dangerous) health literacy —, meaning the presence of the ability to understand medical information turned sour by the simultaneous absence of the ability to recognize it as false.” (Allam, Schulz, Nakamoto, 2014). |
Appendix 4. Interview questions

- Please tell me about yourself.
- When did you start video blogging? What drew you to it? Did you have any concerns?
- What kinds of topics do you make videos about? What kinds of topics are you interested in?
- How do you think up ideas for your videos?
- Could you tell me about your process for making a YouTube video?
- Do you seek information specifically for the purpose of making a YouTube video? Where do you seek this information? Why these sources?
- What have you learned when making YouTube videos? What kinds of competencies, in your opinion, are needed for video blogging?
- Do you follow other video bloggers? Whom and why? Whom would you not follow?
- What kinds of comments have you received about your videos? What types of followers do you have?
- Do you think you can influence your followers somehow?
- What, in your opinion, is meant by health or well-being?
- What kinds of health topics interest you? What kinds of health issues worry you?
- Have you ever thought that something is not ‘healthy’? Why?
### Appendix 5. Guiding questions for analysis

<table>
<thead>
<tr>
<th>NA concept</th>
<th>Guiding questions</th>
<th>Cues for the analysis; Talk or visual presentation of</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discourses in place</td>
<td>How are mediational means used in the social action?</td>
<td>The chosen information-seeking methods, the used technologies and tools</td>
</tr>
<tr>
<td></td>
<td>What kinds of discourses are present in the social action? What is talked about, and how?</td>
<td>The used information sources</td>
</tr>
<tr>
<td></td>
<td>What kinds of information sources are deemed trustworthy and/or competent?</td>
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<tr>
<td>Interaction order</td>
<td>What kinds of roles and role expectations do the participants have?</td>
<td>The information that is presented to the audience and researcher</td>
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<tr>
<td></td>
<td>How does the interaction play out between the video blogger and her audience or the researcher?</td>
<td>The norms and attitudes that are guided by peer groups or other communities</td>
</tr>
<tr>
<td></td>
<td>What kinds of power relations or mutual histories are present in the social action?</td>
<td></td>
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<tr>
<td>Historical body</td>
<td>What kinds of information practices emerge in the social action?</td>
<td>The learned practices, experiences and motives regarding information seeking and credibility assessment</td>
</tr>
<tr>
<td></td>
<td>What kind of activities are related to information-seeking and evaluating situations?</td>
<td>Authority statements about information sources</td>
</tr>
<tr>
<td></td>
<td>What prior knowledge and experiences are brought to the scene? How habitual is this action for the participants?</td>
<td>The differences between talk and actions</td>
</tr>
</tbody>
</table>
List of original publications


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177. Komu, Teresa (2020) Pursuing the good life in the North: examining the coexistence of reindeer herding, extractive industries and nature-based tourism in northern Fennoscandia


180. Käämä, Marijukka (2020) Social difference as action: a nexus analysis of gender and ability in World of Warcraft game culture

181. Sokol, Robin (2021) Taking the next step in a collaborative project: a multimodal analysis of verbal and embodied actions at the computer

182. Koivumäki, Kaisu (2021) Fragmented science communication: mapping the contemporary challenges of organizational science communication


184. Nuortimo, Kalle (2021) Hybrid approach in digital humanities research: a global comparative opinion mining media study


187. Keräinen, Teija (2021) Everyday energy information literacy: defining the concept and studying it empirically in Finland

188. Vehkavuori, Suni-Maria (2021) Early lexicon: associations to later language skills and screening

189. Cooke, Taina (2021) Culture on trial: an ethnographic study of the de/constructing of culture in Finnish law courts


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A NEXUS ANALYTICAL STUDY