The Concept and Components of Engagement in Different Domains Applied to eHealth: A Systematic Scoping Review

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Within the context of eHealth interventions, a shared understanding of what constitutes engagement in and with eHealth technologies is missing. A clearer understanding of engagement could provide a valuable starting point for guidelines relating to the design and development of eHealth technologies. Given the cross-disciplinary use of the term “engagement,” investigating how engagement (and its components) is conceptualized in different domains could lead to determining common components that are deemed important for eHealth technological design. As such, the aim of this paper was 3-fold: (a) to investigate in which domains engagement features, (b) to determine what constitutes engagement in these different domains, and (c) to determine whether there are any common components that seem to be important. A comprehensive systematic scoping review of the existing literature was conducted in order to identify the domains in which engagement is used, to extract the associated definitions of engagement, and to identify the dimensionality or components thereof. A search of five bibliographic databases yielded 1,231 unique records. All titles, abstracts, and full texts were screened based on specific inclusion and exclusion criteria. This led to 69 articles being included for further analyses. The results showed that engagement is used in seven functional domains, categorized as follows: student (n = 18), customer (n = 12), health (n = 11), society (n = 10), work (n = 9), digital (n = 8), and transdisciplinary (n = 1) domains. It seems that some domains are more mature regarding their conceptualization and theorizing on engagement than others. Further, engagement was found to be predominantly conceptualized as a multidimensional construct with three common components (behavior, cognition, and affective) shared between domains. Although engagement is prolifically used in different disciplines, it is evident that little shared consensus as to its conceptualization within and between domains exists. Despite this, engagement is foremost seen as a state of being engaged in/with something, which is part of, but should not be confused with, the process of engagement. Behavior, cognition, and affect are important components of engagement and should be specified for each new context.

Keywords: engagement, eHealth, mHealth, systematic scoping review, positive organizational e-interventions
INTRODUCTION

Developing scalable, cost-effective, and efficient technological solutions to enhance the general health and well-being of individuals has become vital within today’s digital economy (Stand and van Zyl, 2019). Positive organizational interventions that focus on harnessing and improving individuals’ strengths to increase employees’ well-being, and organizational outcomes are examples that have begun to gain more attention (Winslow et al., 2017; Salanova and Ortega-Maldonado, 2019). Designing these types of solutions requires designers to ensure that technological interventions (such as health apps and web-based platforms) not only are effective and usable but also have the potential to actively immerse consumers and users in its content (Couper et al., 2010). If individuals are able to actively engage with such technologically driven interventions, they could potentially reap all the associated physical and psychological health benefits that it may bring. However, it has been shown and argued that technologically driven interventions often do not fully engage people, thereby limiting the effectiveness thereof (Christensen et al., 2009; Donkin et al., 2011; Kelders et al., 2012; Perski et al., 2017). Designing engaging technological interventions is therefore a crucial success factor to consider. Although there is considerable agreement in the literature in support of this argument, as well as the benefits that engagement yields, little consensus exists with regard to what engagement is and how it should be conceptualized.

In eHealth, the use of technology to support health and well-being, a much-documented issue related to a lack of engagement, is non-adherence. Often, people who use an eHealth solution do not use the offered technology the way in which the developers intended; this is what researchers refer to as non-adherence (Christensen et al., 2009; Kelders et al., 2012). Examples are participants not completing all lessons within an eMental health intervention, or not using all of the functions within a diabetes management system. Research has shown that there is a dose—response relationship: for people who use a technology more, the positive effects are greater (Donkin et al., 2011; Yeager et al., 2018). However, not all eHealth interventions show this relationship, and it has been argued that this has to do with the way adherence is conceptualized. The assumption that increased frequency of use equates to “better results” does not necessarily ring true (Sieverink et al., 2017; Kelders, 2019). Also, it seems that the reasons why people choose to use an intervention might be more important than the frequency or duration of its use. Research shows that when users feel involved in, or are able to identify with the intervention, the effects may be larger (Donkin and Glozier, 2012; Kelders, 2015). Similarly, a review on engagement in digital health interventions described engagement as the extent of usage and a subjective experience characterized by attention, interest, and affect (Perski et al., 2017). This definition clearly describes engagement to be more than only usage of a system. However, the majority of articles included in that review only viewed engagement in behavioral terms, that is, as usage. This call to see and measure engagement not (just) through usage data is shared by more researchers (Yardley et al., 2016; Short et al., 2018) not only within the field of eHealth technologies (O’Brien and Toms, 2008; Doherty and Doherty, 2018).

It is important to note here that both the content and the design (the way the content is delivered) of the intervention may influence users’ level of engagement or adherence. The design of a technological solution, its aesthetics, functionality, and behavior, is an important precursor to individuals’ engagement, because such actively influences their experience of—their emotional connection to—and the behavior directed toward the intervention (Desmet and Hekkert, 2007; Ludden et al., 2012; Niedderer et al., 2017). When controlling for intervention content, providing users with a highly immersive, personalized intervention experience seems to be more effective in enhancing outcomes than providing them with static, linear, and unengaging content (Couper et al., 2010; Kelders et al., 2018). In other words, the design of a technologically driven intervention strongly influences how it is perceived, how it is employed, and how effective it will eventually be (Ludden et al., 2015; Kelders, 2019). Given the importance that the design of a technological solution poses for both engagement and adherence, it is not surprising that it has become a centrally debated topic within the domains of Interaction Design and Human Computer Interaction in recent years (Doherty and Doherty, 2018). Researchers from these fields actively advocate for the design of highly engaging and immersive user experiences in order to enhance utilization and manage non-adherence. However, despite its relative importance, there is still no generally accepted model or theory on how design influences engagement. Overbeeke and colleagues (Overbeeke et al., 2004), for example, stated that engagement in interaction should be reinstated by a focus on the physicality of the product. In their line of reasoning, the aesthetics of interaction (the sensory pleasure that people experience through interaction) play an important role in engrossing individuals within the interaction. In contrast, Gulotta and colleagues (Gulotta et al., 2016) argued that the active use of a technologically driven intervention is a function of an alignment between an individual’s desire for and ability to achieve a specific outcome with said system. Here, the alignment between the personal characteristics of the user and the nature of the design seems to be an important factor for engagement. These types of inconsistencies in the literature result in confusion as to how intervention platforms should be designed in order to enhance engagement.

It is therefore clear that despite the agreement among all disciplines from which eHealth intervention research draws as to the importance of engagement, a commonly shared conceptualization of such is lacking. As engagement is a broad concept that has been used in many domains, it seems useful to look at how other domains define and use engagement in order to capitalize on such within eHealth intervention design. Whereas in eHealth the discussion on what engagement constitutes is just emerging, other domains have a rich tradition in studying engagement [e.g., patient engagement (Carman et al., 2013) and work engagement (Bakker et al., 2008)]. Important discussions in these domains are, for example, whether engagement should be seen as a process (getting and remaining engaged and/or disengaged) or a state (of being engaged) (Sonnentag, 2017).
In these domains, engagement is seen as a multidimensional construct consisting of multiple components (Graffigna, 2017), mirroring trends within eHealth research that engagement is more than just “usage.” Insight in what these components are in other domains might be a particularly timely step forward to better understand engagement in eHealth technologies. A better understanding of engagement in and with eHealth technologies can provide a much necessary starting point for guidelines for the design and development of eHealth technology.

As such, the aim of this systematic scoping review is to gain a better understanding of in what domains the concept of engagement features and what constitutes engagement in these different domains and to determine whether there are any common components that seem to be important. This systematic scoping review will focus on all domains where engagement is used as a concept, providing that engagement means something more than only using or doing something (e.g., engaging in warfare). Focus will be on which components of engagement are commonly identified and how such can be translated into eHealth intervention research.

**METHODS**

**Research Approach**

In order to determine how engagement is conceptualized, and to determine the global factors underpinning such, a systematic scoping review was conducted in line with existing guidelines (Peters et al., 2015). A systematic scoping review was deemed the appropriate method because of its focus on mapping the concept of engagement (Arksey and O’Malley, 2005). This approach is particularly useful to synthesize and summarize knowledge about an objective in question that exhibits a high level of heterogeneity and complexity that spans disciplines (Horsley, 2019).

**Search Strategy**

A comprehensive, systematic literature search was conducted between August 2018 and January 2019 in the following bibliographic databases: Scopus, Web of Science, Science Direct, PsycINFO, and ACM Digital Library. The databases were queried with a combination of the terms “engagement” AND “concept OR theory OR definition” occurring in the title of published, peer-reviewed articles. The last run was conducted on 18 January 2019. With the use of this search string, 2,143 titles were identified from 1994 up until 2018 (see Figure 1 for the flow diagram of article selection).

**Eligibility Criteria**

This review aimed to identify peer-reviewed academic articles (seminal works) that aimed to provide a definition, conceptualization, or theory of engagement, within any discipline. Only academic peer-reviewed scientific papers and conference proceedings that were published in English were eligible for inclusion in this study. Exclusion criteria were as follows:

1. Papers that only focused on antecedents or consequences of engagement and did not include a focus on the concept of engagement itself, for example, papers that solely aimed to explain or predict engagement (e.g., trust and usability) or focus on factors that resulted from engagement (e.g., enhanced performance), which did not specifically focus on conceptualizing engagement itself. This exclusion criterion was deemed relevant because of the large number of studies that focus solely on antecedents and consequences but do not provide any (new) information on the concept of engagement itself. Studies that state that they (also) focus on the concept of engagement were not excluded.

2. Papers that solely used the concept of engagement as a metric or as part of a larger empirical model, for example, papers aimed at using engagement as a factor in a structural model. This exclusion criterion was deemed relevant because of the large number of studies that only used a measure of engagement as part of a larger empirical model, while not providing additional information on the concept of engagement itself.

3. Papers that only employed engagement as a synonym for another term or to indicate action (e.g., interaction with the press and engagement in warfare).

4. Unpublished masters or doctoral theses.

5. Textbooks and book chapters were also excluded, because many textbooks and book chapters provide more of an overview of earlier work than new insights as original research papers do, and not all textbooks and book chapters are peer reviewed.

**Study Selection**

Study selection was done in two steps. First, after duplicates were removed, the titles and abstracts of all retrieved articles were screened for eligibility by two authors (SK and LvZ or GL). Next, the full text of all remaining publications was checked for inclusion by two authors (SK and LvZ or GL). Disagreements on the inclusion or exclusion of publications were discussed until agreement was reached. The average percentage of agreement between authors was approximately 90%, which is higher than the suggested 70% overlap (Booth et al., 2012). To check whether seminal works had been overlooked during the initial search process, included papers were checked whether they referred to any important publications that were not yet included.

**Data Extraction**

The characteristics of all included studies were extracted by one author (SK). Data extraction of 20% of the included studies (n = 14) was validated by the other authors. Data items that were extracted from each included study were country of origin, year of publication, type and subtype of engagement, purpose of the study, used methods, and main findings. Furthermore, for each included paper, the definition of engagement used was extracted. Here, it is was indicated whether this was a process definition (i.e., a definition about the process of getting and remaining engaged and/or disengaged); whether the definition was newly developed or already existing; or if no specific definition was chosen or if the definition was unclear. Lastly, whether engagement was said to consist of multiple components, and what these components were, was extracted.
RESULTS

Study Selection
The search yielded 1,231 unique titles after duplicates were removed. After title, abstract, and full text screening, 69 articles were included (Figure 1). In total, 91 titles were excluded based on the full text. The most common reason for exclusion was that the titles were not peer-reviewed articles (n = 40). Of these, many were book chapters that are often not peer-reviewed and/or provide more of a summary of earlier work than new studies. Twenty titles were excluded because they included the concept of engagement in the title, but the study was not concerned with engagement itself and therefore did not provide any new insights on the concept or definition. Another 16 articles were excluded because they focused on antecedents or consequences of engagement, but not on the concept itself. Although these papers are interesting, they were excluded from this review because the focus is on what constitutes engagement and not on antecedents or consequences. Nine publications were excluded because in the full texts it became clear that engagement was not used as a concept in itself but only as a synonym for participation, involvement, or to action something specific. Lastly, six studies were excluded because the full texts were not in English.

Characteristics of Included Studies
In total, 69 papers published from 1990 up until 2018 were included. Publications were sparse from 1990 until 2007 (a total of n = 7); however, it increased substantially afterwards, with a peak in 2017 (n = 14). Almost half of the publications emanated from the USA (n = 31), 21 publications originated from Europe, 10 from Australia and New Zealand, and three from Canada and the others ranging from United Arab Emirates to Japan. We categorized the papers into seven domains of engagement: student (n = 18), customer (n = 12), health (n = 11), society (n = 10), work (n = 9), digital (n = 8), and transdisciplinary (n = 1). Each category is discussed below. For each category, the characteristics of the studies are provided in a separate table. All definitions used in the different studies are provided in Appendix 1.
Student Engagement

Table 1 shows the characteristics of the 18 studies classified as student engagement. Of these studies, 11 used the term student engagement, and three focused on school engagement, two on agentic engagement (as a component of student engagement), one on reading engagement, and one on academic engagement. Eleven studies analyzed the concept of engagement by discussing or reviewing literature. Four studies focused on developing and testing a scale to measure engagement, using both qualitative and quantitative methods. Three studies used qualitative methods to investigate a stakeholder perspective of the concept and its components. Eight studies used one or more existing definitions of engagement for their study and aimed to get more insight in this definition, whereas seven studies resulted in a new definition. In three studies, it was unclear what definition of engagement the authors have used.

Looking at the components of engagement in this category, there seems to be some consensus: 11 studies mentioned behavior (or physical), affect (or emotion), and cognition as components of engagement. However, within these studies, there is much discussion on what exactly these components entail. Another five studies mention two of these components, or suggest other components besides behavior, affect and cognition, for example, agentic engagement. The last study also identifies cognition (cognitive effort) and adds other components as interest and mindfulness. Furthermore, two studies explicitly mention that the opposite of engagement (termed disengagement or disaffection) is also a construct that needs to be conceptualized (Skinner et al., 2009; Wang et al., 2019). Lastly, multiple...
TABLE 2 | Characteristics and findings of customer engagement studies.

| Study and subtype | Purpose | Method | Main findings | Definition and components |
|-------------------|---------|--------|---------------|--------------------------|
| (Abdul-Ghani et al., 2018); consumer | Analyze concept | Qual. | New definition and key themes (immersion, passion and activation) | New; cognitive, emotional, behavioral |
| (Bowden, 2014); customer | Apply to specific area + stakeholder perspective | Qual. | Conceptual framework with engagement cycle in C2C contexts | New; cognitive, affective, self-image, motivation |
| (Brodie et al., 2011); customer | Evaluate concept + development and validate scale | Qual. + quant. | Confirm concept; antecedents and consequences; scale validation | Existing; cognitive processing, affection, activation |
| (Dhanesh, 2017); customer | Analyze concept in specific area | Systematic review | Two different conceptualizations (behavioral activity or holistic) | New; behavior, cognition, emotion |
| (Gambetti and Gambetti, 2015); consumer brand | Analyze concept | Qual. | Conceptual framework to classify engagement programs | New; activation, engaged behaviors |
| (Hollebeek, 2011); customer brand | Analyze concept + new conceptualization | Discuss literature + qual. | Components confirmed; antecedents and consequences | New; physical, emotional, cognitive |
| (Hollebeek et al., 2014); customer brand | Evaluate concept + development and validate scale | Qual. + quant. | Components confirmed; antecedents and consequences | New; physical, emotional, cognitive |
| (Kulta and Karjaluoto, 2016); mobile customer | Analyze concept in specific area | Systematic review + case | Typology and model with characteristics, antecedents and consequences | Unclear; cognitive, affective, behavioral, agentic/emphatic, para-social |
| (Mittler et al., 2013); consumer | Apply to specific area + propose framework | Systematic review + case | Components confirmed; antecedents and consequences | New; management cooperation, individual participation, performance tolerance |
| (Solem and Pedersen, 2016); Customer brand | Analyze concept + develop and test scale | Discuss literature + qual. | Components confirmed; antecedents and consequences | New; management cooperation, individual participation, performance tolerance |
| (Tan and Apisit-Irsiyah, 2018); brand community | Analyze concept + develop model | Discuss literature + qual. | Components confirmed; antecedents and consequences | New; management cooperation, individual participation, performance tolerance |
| (Yoshida et al., 2014); fan | Analyze concept in specific area + validate new scale | Quant. | Components confirmed; antecedents and consequences | New; management cooperation, individual participation, performance tolerance |

authors stress the need for each study to be clear about what conceptualization of engagement is used (Jimerson et al., 2003; Appleton et al., 2008; Unrau and Quirk, 2014; Bernard, 2015).

Customer Engagement

Table 2 shows the 12 studies classified as customer engagement. These studies used variations of the term for their specific form of engagement (customer or consumer; with or without “brand”) but often did not differentiate between the terms. Interestingly, almost all studies yielded a new definition of engagement. Of the two that did not, one was a follow-up from an earlier study of the same author to evaluate the conceptualization of the previous study, and the other developed a new typology and model but was unclear about the specific definition. Four studies analyzed and applied the concept of consumer engagement to a new area, for example, sports fans, mobile technology, and health care. Eight studies included qualitative or quantitative data and the same number of studies reviewed literature.

When looking at the components, the same components (cognition, affect, and behavior) are found in eight studies, seemingly contradicting the need for a new definition in every study. When looking at these definitions (Appendix 1), it seems that many definitions convey a similar meaning (engagement as a multidimensional construct) but vary in what the different components entail, especially when applying the broad definition to a specific area. Interestingly, two studies explicitly see engagement more as a process than a state where the different components have a dynamic interplay that is more meaningful than the components in isolation (Bowden, 2014; Gambetti and Gambetti, 2015).

Health Engagement

Table 3 shows the 11 studies classified within the health engagement category. Within this category, there are numerous subtypes of which some (e.g., patient engagement, n = 3) seem to be broader than others (e.g., engagement in persons with dementia, n = 2; engagement in genetic testing, n = 1). The main purpose of seven studies is to analyze the concept of engagement, but there is also attention toward discussing and testing measures of engagement (n = 5). Most studies discuss or review literature (n = 8), and some use empirical data (qualitative, n = 3 and quantitative, n = 2) to gain more insight into the concept. There is an equal number of studies that formulate a new definition as studies that use an existing definition (n = 5), showing the breadth of the health engagement category.

This breadth is further illustrated in the components used to describe engagement, as these vary widely. A behavioral component is seen most (n = 8), with participation used most frequently (n = 5). Five studies include more than one behavioral component. Next to the behavioral component, attitude is mentioned most often (n = 4). Lastly, there are four studies that see engagement as a process of which two do not identify any components.
Societal Engagement

Table 4 shows the characteristics of the ten studies classified as societal engagement. Within societal engagement, multiple subtypes are identified. These vary in whose engagement they define and measure, that is, the engagement of citizens (n = 6) (Nicotera et al., 2010; Kemp, 2015; Nguyen et al., 2016; Arvanitidis, 2017; Cortés-Cediel et al., 2018; Pontes et al., 2018) in, for example, their community, politics, or art; the engagement of organizations with citizens (n = 3) (Taylor and Kent, 2014; Sallnow and Paul, 2015; Eder et al., 2018), for example, engagement of research organizations with citizens, or of an end-of-life care service with the community surrounding it; or the engagement of interest groups in policy (n = 1) (Halpin and Fraussen, 2017). Four studies’ main aim is to analyze the concept, but an equal number of studies apply the concept to a new area or seek a stakeholder perspective. Almost all studies discuss literature to achieve their aims (n = 8), but four use qualitative data and one includes qualitative data. Interestingly, only one study used an existing definition, whereas seven studies developed a new definition, often based on earlier definitions. Three studies mainly see engagement as a process, but all but one study identify multiple components of engagement.

Looking at these components, it is difficult to find commonalities, which might be due to the different target groups of these forms of engagement. However, there seem to be quite a few components of engagement that relate to behavior (e.g., civic or online activities). Furthermore, not all components seem to really reflect what engagement is but are motivations to be able to be engaged (e.g., intrinsic motivations to the subject and system), goals of engagement (e.g., to inform or consult), or preconditions to be able to be engaged (e.g., access and prominence).

Work Engagement

Table 5 shows the nine studies categorized as work engagement. Most studies discuss or review literature to analyze the concept and related issues, whereas one uses qualitative data. Within this field, we found three different concepts: work engagement, personal engagement, and employee engagement (in one paper further specified as organization engagement). It seems that in literature, these concepts are sometimes used interchangeably, but a firm need is expressed to use the appropriate concept in the appropriate context (Shuck et al., 2017; Gupta and Sharma, 2018).

For work engagement, there is one dominant (operational) definition, based on the Utrecht Work Engagement Scale.
(UWES) (Bakker et al., 2008). This definition, with the concepts vigor, dedication, and absorption, is used in four of five studies on work engagement. The components have also been categorized as energy, behavior, or physical engagement (vigor); emotion (dedication); and cognition (absorption). The discussion within this concept is mainly on specific issues (e.g., whether work engagement is the opposite of burnout) and less on the definition of the concept itself. For employee engagement, different new definitions have been proposed. The used components mirror the components of work engagement (e.g., cognitive, emotional, and behavioral energy), but other components have also been identified (e.g., social behavior). Interestingly, all studies within this category see engagement as a state and none as a process.

Digital Engagement
Table 6 shows the characteristics of the eight papers categorized as digital engagement. Four papers focus on (general) user engagement, three specifically on digital gaming (of which two on learning games), and one on engagement to digital behavior change interventions. Seven papers discussed or reviewed literature to analyze the concept, whereas three papers (also) used empirical data for this goal. In five studies, a new definition of engagement was constructed, based on the results of the study. Only one paper used an existing definition from literature, one study reviewed definitions but did not choose or construct one itself, and in one study, it was unclear what the chosen definition was based upon. In two papers, engagement is (also) seen as a process.

Seven papers consider engagement to exist of one or more components. Affect or emotion is mentioned in five papers, as well as cognition or related concepts (thought, interest, and attention). Behavior or participation is mentioned in four papers. Looking at the various definitions (Appendix 1), engagement seems to be a much-debated concept in this field, and there seems to be no accepted definition. The two most recent studies both strive to tackle this issue using a systematic review but arriving at two seemingly different conclusions: whereas Perski et al. created a new definition for their specific target area (digital behavior change interventions) (Perski et al., 2017), Doherty and Doherty stated that the field needs to move away from identifying one definition of engagement and that it is more important to select the most useful interpretation and measurement of engagement, based on the context (Doherty and Doherty, 2018).

Transdisciplinary Engagement
One study was classified as covering transdisciplinary engagement as it employs a systematic review to integrate literature on employee, consumer, and patient engagement to find overlap between the concepts (c.f. Table 7). The study concludes that there are similarities between the fields of engagement, for example, in that the concept is seen as consisting of multiple components of which emotional, cognitive, and behavioral are most apparent.

DISCUSSION
The purpose of this systematic scoping review was to investigate in what domains the concept of engagement features and

| Study and subtype | Purpose | Method | Main findings | Definition and components |
|-------------------|---------|--------|---------------|---------------------------|
| (Arvanitidis, 2017); civic | Analyze concept and antecedents | Discuss literature + quant. | Antecedents found | Existing; civic activities, electoral activities, political voice |
| (Cortés-Cediel et al., 2018); citizen | Present a process model | Discuss literature | Life cycle model different phases of engagement | New (process); intrinsic to the subject, intrinsic to the system, subjects’ extrinsic motivations |
| (Eder et al., 2018); community | Stakeholder perspective of concept | Quant. | Different definitions used, but similar indicators and measures | None chosen (process) |
| (Halpin and Fraussen, 2017); policy | Analyze concept | Discuss literature | Identified forms of engagement | Unclear; involvement, access, prominence |
| (Kemp, 2015); arts | Analyze concept + develop measure | Discuss literature + quant. | Scale validated; antecedents and consequences | New; affective, cognitive, behavioral, social, connection |
| (Nguyen et al., 2016); community crowdsourcing | Propose behavioral perspective on definition and measurement | Discuss literature | Illustrate utility of the Participant Engagement Index | New; Activity, intensity, diversity, recency |
| (Nicotera et al., 2010); civic | Develop and validate scale for new target group (preadolescents) | Quant. | Components confirmed and specified | New; foundation for civic ethics, community connection |
| (Pontes et al., 2018); political | Stakeholder perspective of concept | Discuss literature + qual. | New definition; example actions and behaviors | New; cognitive, emotional |
| (Sallnow and Paul, 2015); community | Apply concept to specific topic; present model and definition | Discuss literature | New model with types of engagement | New (process); inform, consult, co-production, collaborate, empower |
| (Taylor and Kent, 2014); dialogic | Analyze concept within dialogue theory | Discuss literature | New definition and conceptualization, fitting in dialogue theory | New; individual participation, relational purpose, advice, contribute |
what constitutes engagement in these different domains and to determine whether there are any common components that seem to be important. With the 69 papers we identified on the conceptualization of engagement, we have identified seven different domains of engagement: student, customer, health, sciences and sociology). Despite the level of maturity within a given discipline, our results showed that engagement is predominantly seen as a multidimensional construct, which is composed of a cognitive, behavioral, and affective component.

### Engagement Across Domains

A first observation is that engagement is viewed as an important concept across different domains but is also much disputed as seen by the many papers that analyze this concept. This resonates with the discussion on engagement in the field of eHealth.
technologies, or digital interventions (e.g., Yardley et al., 2016; Perski et al., 2017; Short et al., 2018). It seems that some fields are more mature regarding their conceptualization and theorizing on engagement than others. In particular, the field of work engagement seems to have a widely accepted definition (Bakker et al., 2008), but even in that area, there are numerous discussions surrounding the concept, for example, what the antipode is, what the attributing conditions are, and what the relationship is with employee/personal engagement. One of the aspects that seemed to have matured the domain of work engagement is the use of a commonly accepted measurement scale (UWES; Schaufeli et al., 2006), which is something that is not found in other fields. Other fields, for example, customer and societal engagement, seem to be somewhat less mature, in that they are in the phase of defining engagement as evidenced by the many new definitions that have been proposed in literature.

In all domains, engagement is mainly seen as a state of being engaged with something, but almost all domains also refer to engagement as a process. This process of getting engaged, staying engaged, disengaging, and re-engaging is sometimes viewed as more important that defining what the state of engagement really is (e.g., Bowden, 2014; Graffigna and Gambetti, 2015). However, it seems that by not separating the process of engagement from the state of engagement, antecedents for engagement can be confused for being part of engagement itself. Examples are digital engagement, where aesthetics have been proposed to be part of engagement (O’Brien and Toms, 2008), but recognized as antecedent or predictor of engagement in other studies (Short et al., 2018), and also societal engagement where motivations, goals, and preconditions are sometimes viewed as being part of engagement (Sallnow and Paul, 2015; Halpin and Fraussen, 2017; Cortés-Cediel et al., 2018).

### Engagement as a Multidimensional Construct

The results further show that across different domains, engagement is predominantly seen as a multidimensional construct comprising behavioral, cognitive, and affective components. There seems to be consensus on the combination of these three components in the domains of student and work engagement. Moreover, in customer and digital engagement, this combination is also seen quite often, although there does not seem to be consensus on the simultaneous manifestation or combination of these components (yet). In contrast, conceptualizations within health engagement seem to place more emphasis on the behavioral component (e.g., participation), but there is an ongoing discussion that engagement should be more than just doing something (Bright et al., 2015; Graffigna and Barello, 2018), which is similar to the discussion seen in engagement with eHealth technologies (Perski et al., 2017; Short et al., 2018). Similarly, societal engagement places emphasis on the behavioral component of engagement (e.g., various activities; Arvanitidis, 2017); however, recent discussions within the literature seem to point to engagement being more than just involvement or participation in societal activities (Pontes et al., 2018).

Although there is congruence between different domains as to the presence of behavioral, cognitive, and emotional components of engagement, the content of such differs significantly. Even within mature domains, such as work engagement, there are still debates into the psychological conditions or activities that categorize each of these components. For example, Kahn (1990) indicated that the physical/behavioral component of engagement refers to the extent toward which an individual can express himself or herself physically in a work role, whereas Bakker et al. (2008) argued that vigor (the physical/behavioral component in his model) refers to physical energy derived from work. The content of such differs even more between domains such as student engagement vs. work engagement. It is therefore understandable that different conceptualizations and definitions of engagement exist within and between different domains. Various studies aim to clarify what is meant by the behavioral, emotional, and cognitive components of engagement within a given context. This is done by either (a) constructing an operational or context-specific definition or approach of engagement or (b) employing a general meta-level model for engagement. The former results in a proliferation of definitions of engagement, which is difficult to keep track of or to maintain, and the latter results in a meta-level construct that ignores the context-specific challenges, experiences, or attributing factors. Arguably, an approach that lies between both options holds most merit for conceptualizing engagement in a new domain as eHealth interventions.

### Implications for Engagement With eHealth Technologies

Interest in understanding engagement within different disciplines has been increasing during the past three decades. Despite agreement between domains as to its importance, it is clear that theoretical discussions as to its conceptualization is ongoing within the literature. Controlling for context and discipline, it would seem as though engagement is predominantly seen as a state of being involved in or occupied with an object, activity, or artifact, which usually results in a positive outcome. This is part of the larger process of engagement.
Second, to go beyond the meta-construct of engagement, which ignores the context-specific challenges, experiences, or attributing factors and at the same time avoid a proliferation of definitions of engagement, which is difficult to keep track of or to maintain, it seems that the field needs a clear, tailored, and domain specific definition of the construct, which captures the associated emotional, behavioral, and cognitive components present within the given context. Questions that may need to be answered to arrive at this domain specific definition are, for example, whether behavioral engagement includes just the amount of usage or whether it should also include the quality of usage, for example, using as intended (Sieverink et al., 2017); whether interest and attention are the relevant cognitive aspects (Perski et al., 2017) or should other concepts be considered as, for example, involvement (Kelders et al., 2018) or “macro-engagement” (Yardley et al., 2016); and whether only positive emotions such as enjoyment should be seen as affective engagement or might negative affect also play a role, for example, when experiencing through eHealth technology that you have not reached your health-related goals (Triberti et al., 2018). In particular, when investigating the role of affect, a complicating factor is whether we should distinguish between experiences that are brought about by the content of the intervention and those that are triggered by the design of the intervention, for example, the sensory pleasure that people might derive from interacting with the intervention or the meaning they attribute to a particular feature in the design and that influences their affect. This is an area that has not received much attention but may give us more insight in the interplay between the design and content of interventions.

Ultimately, this may lead to a context-specific definition of engagement on a lower abstraction level, with an appropriate measurement method. However, it stands to reason that the more detailed the specification of the components will become, the more it will be aimed at one specific form of eHealth technologies. As the eHealth domain is very broad (e.g., encompassing interventions with or without care professionals; various devices and technologies; and various contexts), it is still an open question whether it is possible to gain a sufficiently detailed specification of the behaviors, cognitions, and affect that constitute engagement that is still broad enough to encompass the breath of the eHealth domain or whether there should be multiple specifications (and definitions) for subdomains. Therefore, it remains important for each individual study to be clear about what they mean by engagement.

Having a more commonly accepted understanding of the different components of engagement for eHealth technologies could allow a more structured investigation of how different technologies and forms of eHealth impact engagement; for example, in what way does blended care, or new forms of technology such as wearables, interactive devices, and virtual and augmented reality impact (the different components of) engagement? Also, new questions may then be addressed; for example, do people have different styles of being engaged; are some more inclined to be behaviorally engaged and others more affectively engaged (Kelders and Kip, 2019)? This might shed more light on why certain strategies, as, for example, gamification, work for some but not for others.

**STRENGTHS AND LIMITATIONS**

This review set out to give an overview of how engagement is conceptualized in different fields. This is both the major strength and limitation of the review. By encompassing many different fields, a comprehensive overview of conceptualizations is given, which can inspire researchers in the field of eHealth technologies and beyond to use the concept of engagement in a substantiated way. However, owing to the large scope of the review, we needed to limit the search to papers that indicate in the title their focus on the concept of engagement. This may have caused us to miss papers that provide interesting insights on engagement but whose main focus was other than that. However, we feel that we have overcome this limitation by including many overview and review papers that do take these primary studies into account.

**DATA AVAILABILITY STATEMENT**

All datasets generated for this study are included in the article/Supplementary Material.

**AUTHOR CONTRIBUTIONS**

SK, LZ, and GL contributed to the conception and design of the study. SK performed the search, analysis, and wrote the first draft of the manuscript. LZ and GL contributed to the search and analysis. LZ and GL wrote sections of the manuscript. All authors contributed to manuscript revision, read and approved the submitted version.

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**SUPPLEMENTARY MATERIAL**

The Supplementary Material for this article can be found online at: [https://www.frontiersin.org/articles/10.3389/fpsyg.2020.00926/full#supplementary-material](https://www.frontiersin.org/articles/10.3389/fpsyg.2020.00926/full#supplementary-material)
REFERENCES

Abdul-Ghani, E., Hyde, K. F., and Marshall, R. (2018). Conceptualising engagement in a consumer-to-consumer context. Australas. Market. J. 27, 2–13. doi:10.1016/j.ajus.2018.06.004

Appleton, J. J., Christenson, S. L., and Furlong, M. J. (2008). Student engagement with school: critical conceptual and methodological issues of the construct. Psychol. Sch. 45, 369–386. doi:10.1002/pits.20030

Arksey, H., and O’Malley, L. (2005). Scoping studies: towards a methodological framework. Int. J. Soc. Res. Methodol. 8, 19–32. doi:10.1080/1364550300119616

Arvanitidis, P. A. (2017). The concept and determinants of civic engagement. Hum. Aff. 27, 252–272. doi:10.1515/humaff-2017-0022

Bakker, A. B., Schaufeli, W. B., Leiter, M. P., and Taris, T. W. (2008). Work engagement: an emerging concept in occupational health psychology. Work Stress 22, 187–200. doi:10.1080/02678307082393649

Bargagliotti, A. L. (2012). Work engagement in nursing: a concept analysis. J. Adv. Nurs. 68, 1414–1421. doi:10.1111/j.1365-2640.2011.05859.x

Barkaoui, K., Barrett, S. E., Samaroo, J., Dahya, N., Alidina, S., and James, C. E. (2015). Teachers’ conceptions of student engagement in learning: the case of three urban Schools. Alberta J. Educ. Res. 61, 80–99.

Bernard, J. S. (2015). Student engagement: a principle-based concept analysis. Int. J. Nurs. Educ. Scholarsh. 12:58. doi:10.1186/ijnes-2014-0058

Booth, A., Papaioannou, D., and Sutton, A. (2012). The literature review: its role within research. Syst. Approach. Successful Literature Rev. 1, 1–16.

Bouvier, P., Lavoué, E., and Sehaba, K. (2014). Defining engagement and characterizing engaged-behaviors in digital gaming. Simulation Gaming 45, 491–507. doi:10.1177/104687811453573

Bowden, J. L.-H. (2014). The process of customer engagement: a conceptual framework. J. Market. Theor. Pract. 17, 63–74. doi:10.2753/TP0169-6679170105

Bright, F. A., Kayes, N. M., Worrall, L., and McPherson, K. M. (2015). A conceptual review of engagement in healthcare and rehabilitation. Disabil. Rehabil. 37, 643–654. doi:10.3109/09638288.2014.933899

Brodie, R. J., Holleebeek, L. D., Juric, B., and Bić, A. (2011). Customer engagement. J. Serv. Res. 14, 252–271. doi:10.1177/1094670511411703

Burch, G. F., Heller, N. A., Burch, J. J., Freed, R., and Steed, S. A. (2015). Student engagement: developing a conceptual framework and survey instrument. J. Educ. Business 90, 224–229. doi:10.8883/2323.2015.1019821

Carman, K. L., Dardess, P., Maurer, M., Sofaer, S., Adams, K., Becthel, C., et al. (2015). The nature of work engagement: toward a new need-based theory of work motivation. Res. Organ. Behav. 37, 1–18. doi:10.1016/j.robi.2017.10.007

Halpin, D. R., and Fraussen, B. (2018). Spotlight on the Patient Health Engagement model (PHEl model): a psychosocial theory to understand people’s meaningful engagement in their own health care. Patient Prefer Adherence 12, 1261–1271. doi:10.2147/PPA.S154646

Graffigna, G., and Gambetti, R. C. (2015). Grounding consumer-brand engagement: a field-driven conceptualisation. Int. J. Market. Res. 57, 605–630. doi:10.2501/IJMR-2015-049

Doherty, K., and Doherty, G. (2018). Engagement in HCI: conception, theory and measurement. ACM Comput. Surveys 51, 1–39. doi:10.1145/3234149

Doherty, K., Hendriksen, J., Naismith, S. L., Neal, B., Hickie, I. B., and Glozier, N. (2011). A systematic review of the impact of adherence on the effectiveness of e-therapies. J. Med. Internet Res. 13:e52. doi:10.2196/jmir.1772

Doherty, K., and Glozier, N. (2012). Motivators and motivations to persist with online psychological interventions: a qualitative study of treatment completers. J. Med. Internet Res. 14:e91. doi:10.2196/jmir.2100

Dreijng, K., Thil, S., and Hemeren, P. (2015). Engagement as a traceable motivational concept in human-robot interaction. IEEE 4, 956–961. doi:10.1109/ACII.2015.7346690

Eder, M. M., Evans, E., Funes, M., Hong, H., Reuter, K., Ahmed, S., et al. (2018). Defining and measuring community engagement and community-engaged research: clinical and translational science institutional practices. Prog. Commun. Health Partnersh. 12, 145–156. doi:10.1353/cpr.2018.0034

Fredricks, J. A., Blumenfeld, P. C., and Paris, A. H. (2004). School engagement: an emerging concept in occupational health psychology. Psychol. Sch. 41, 369–386. doi:10.1002/pits.20303

Fredricks, J. A., Blumenfeld, P. C., and Paris, A. H. (2004). School engagement: an emerging concept in occupational health psychology. Work Stress 22, 187–200. doi:10.1080/02678307082393649

Graffigna, G. (2017). Is a transdisciplinary theory of engagement in organized settings possible? A concept analysis of the literature on employee engagement, consumer engagement and patient engagement. Front. Psychol. 8, 872. doi:10.3389/fpsyg.2017.00872

Graffigna, G., and Barello, S. (2018). Spotlight on the Patient Health Engagement model (PHEl model): a psychosocial theory to understand people’s meaningful engagement in their own health care. Patient Prefer Adherence 12, 1261–1271. doi:10.2147/PPA.S154646

Graffigna, G., and Gambetti, R. C. (2015). Grounding consumer-brand engagement: a field-driven conceptualisation. Int. J. Market. Res. 57, 605–630. doi:10.2501/IJMR-2015-049

Doherty, K., and Doherty, G. (2018). Engagement in HCI: conception, theory and measurement. ACM Comput. Surveys 51, 1–39. doi:10.1145/3234149

Doherty, K., Hendriksen, J., Naismith, S. L., Neal, B., Hickie, I. B., and Glozier, N. (2011). A systematic review of the impact of adherence on the effectiveness of e-therapies. J. Med. Internet Res. 13:e52. doi:10.2196/jmir.1772

Doherty, K., Hendriksen, J., Naismith, S. L., Neal, B., Hickie, I. B., and Glozier, N. (2011). A systematic review of the impact of adherence on the effectiveness of e-therapies. J. Med. Internet Res. 13:e52. doi:10.2196/jmir.1772

Doherty, K., Hendriksen, J., Naismith, S. L., Neal, B., Hickie, I. B., and Glozier, N. (2011). A systematic review of the impact of adherence on the effectiveness of e-therapies. J. Med. Internet Res. 13:e52. doi:10.2196/jmir.1772
Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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