

RETHINKING THE CONCEPTUALISATION OF ONLINE EDUCATION

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Abstract

This paper deals with the question of how to conceptualise online education. To answer this question data from an online course were interpreted through a theoretical frame consisting of interactional and transactional approaches to human action. Consequences for understanding and conceptualise the environment, technology, and communication in online education were unfolded. Conceptualisations building on the concept of learning environment were found to be problematic.

Introduction

A search of Google Scholar shows that there are a growing number of studies that focuses on students and teachers actions in online education. There are a significant number of studies each year that focuses on such actions, particularly in terms of participation in computer-mediated communication (CMC). The discussions of action in these studies are often linked to the term “learning environment” (e.g., Anderson, 2009; Merriënboer & Kirschner, 2007; Moreno & Mayer, 2007). This performance of action in learning environments could be discussed in terms of being a part of or an aspect of a conceptualisation of education. However, all conceptualisations of education bring ontological assumptions about how to understand the relation between human action and the environment. In the case of discussing performance of human action in terms of learning environments these assumptions build on an interactive approach. Nevertheless, studies of online education usually leave these ontological assumptions unquestioned. However, to avoid a naïve understanding any analysis needs to pay some attention to the ontological assumptions of the key concepts. Here we will go deeper into the consequences of these assumptions. Therefore, this paper utilises transactional assumptions of human action to discuss conceptualisations of online education and to challenge the prevailing interactional approach (Altman & Rogoff, 1991; Dewey & Bentley, 1949/1960). This discussion starts with unfolding the relation between man and the environment and then moves on with a description of the paper’s empirical frame, an online course where students and teachers apply CMC. The following sections discuss issues that relate ontological assumptions of the environment to education, technology

and communication. Finally, conclusions are drawn from the paper's elaboration of key concepts in educational conceptualisations.

How the actions of man are to be understood has been debated at least since the philosophical writings of Plato. It includes issues such as how to relate the mind of man to the surrounding environment. Through history, at least three different positions have held favour (Wartofsky, 1979). The first two positions, idealism and empiricism, make dualistic claims about the relation of mind to the environment. Idealists such as Plato emphasised the mind as the location where the real world exist. The environment outside is just a shadow world, a mirror of the ideas that exist solely in the mind of man. The empiricist position, popularised by Francis Bacon in the 17th century, is that the environment consists of matter in motion. In this view, the mind is a separate mental world, which is subject to the influence of external experiences. These dualist positions encountered critical remarks over the strong separation of mind, body and environment. Empiricists were criticised for reducing human beings to machines and idealists were criticised for ignoring the materiality of the world. In other words, these two positions emphasise a perspective where human action is a product of man acting on a surrounding environment independent and external to the mind of man.

The third position rejects the dualism between mind and body or mind and environment. Instead, it embraces a dialectical and ecological view that emphasises the relation between mind and environment as a dynamic whole. There is a necessary relationship between man and the environment embracing the idea that human action cannot be separated from its surroundings. In challenging interactive views of human action this position is taken. The following section elaborates this view further.

During the late 19th and the early 20th centuries, scholars rejected the dualist view of man and the world by linking human action to social life and societal development (e.g., Dewey, 1916; Vygotsky, 1934/1987). They regarded "every historically developed social form as in fluid movement, and therefore takes into account its transient nature not less than its momentary existence" (Marx, 1867/1990, p. 11). These scholars emphasised the social, cultural, and historical transformations that occur through human activity. Building on this dialectical and materialistic view of the world, they highlighted the link between man and the surrounding environment. Dewey criticised the empiricist dualist position of mind and the environment and claimed that it isolated people from each other and the communities in which they exist. In other words, there is no escape from either the physical or the social aspects of the environment. Human action occurs as part of this environment and is a condition for the emergence, in a human being, of "a mind of his own" (Dewey, 1916, p. 344). Mind and the surrounding environment are inseparable and "the self achieves mind in the degree in which knowledge of

things is incarnate in the life about him; the self is not a separate mind building up knowledge anew on its own account” (Dewey, 1916, p. 344). Humankind is in symbiosis with the environment while “the influence of nature on man, asserts that man, in turn, affects nature and creates through his changes in nature new natural conditions for his existence” (Vygotsky, 1978, p. 60). Therefore, being part of the world is to live as part of the emerging cultural, historical, and social patterning of the world. In this view, human action is inseparable from the culturally, historically, and socially transformed configuration of the surrounding environment (Vygotsky, 1934/1987).

However, the dualist and non-dualist positions could be distinguished on their conceptualisation of human action. These two positions affords two different approaches to the analyses of human action, interactional and transactional approaches (Altman & Rogoff, 1991; Dewey & Bentley, 1949/1960). Interaction derives from the Newtonian laws of motion where “action and reaction are equal and opposite . . . classical mechanics is such a system of interaction involving particles, boundaries, and laws of effects” (Dewey & Bentley, 1949/1960, p. 68). Such an interactional approach to human action “shatters the subjectmatter into fragments in advance of inquiry” (Dewey & Bentley, 1949/1960, p. 68). In other words, the interactional approach retains a dualistic division of elements or variables, for example man — environment or mind — environment.

An alternative non-dualist approach to human action includes transactional observations which reach across time and space. These are historical and comprise “the right to see together, extensionally and durationally, much that is talked about conventionally as if it were composed of irreconcilable separates” (Dewey & Bentley, 1949/1960, p. 69). Transactional approaches incorporate a wider view of human action. In these approaches “there are no separate elements . . . the whole is composed of inseparable aspects that simultaneously and conjointly define the whole” (Altman & Rogoff, 1991, p. 24). Furthermore, transactional approaches focus on situations, which occur where actions and environment intersect. Therefore this approach not only incorporates temporal and spatial processes but also change.

By contrast, interactional approaches are committed to a narrow study of human action which takes no account of cultural, historical, social, or temporal conditions or motives. In other words, interactional approaches separate human action from environmental and situational aspects of the action. The rest of the paper explores the consequences of applying these two different approaches of human action for understanding participation in online education through CMC.

The Online Course

The data discussed below arise from a course “Flexible Learning” offered as a fulltime 5-month course by a department of Education at a Swedish university. The majority of the collaborative actions in the course were supposed to be performed through what some scholars call a learning management system (LMS). These systems include an assembly of different technological features, such as chat, electronic conferences, and e-mail (e.g., Paulsen, 2003).

The course consisted of four 5-week modules. The study guide consists of five documents, which describe the course extensively. There is one document for each module and one describing the general structure of the course. The general guide and the first module guide were distributed in hard copy to the students ahead of the start of the course, and they were also made available online as PDF files.

This article includes discussion of the participation of 15 students and 3 teachers. Fourteen lived in Sweden, and one had recently moved abroad. One of these students was a male. Some students were training to be teachers while others were participating in a course in Education for the first time. The students’ age ranged from 21–43, with a majority between 30–35. Students’ experience of participating in online courses ranged from nothing up to two years. All three university teachers had at least nine years online experience.

At the beginning of the course, the teachers randomly divided the participating students into three study-groups. All willingly agreed to be part of the study, but two of the students could not be reached to give permission for their postings to be used in this paper. However, all student names are fictional. Since I was one of the teachers in the course, and since I subsequently decided to use the course data in my research, none of the exchanges with myself is included below. Finally, and for the same reason, the other two teachers were responsible for the selected tasks given to the students.

Sampling Online Utterances

The study was conducted as an instrumental single-case study insofar as it could provide insights into online courses in higher education. In this approach the examined course was “looked at in depth, its contexts scrutinized, its ordinary activities detailed” (Stake, 1994, p. 237). Therefore, the investigation adopted an approach that was sensitive to the specific educational conditions of the online course. It embraced descriptions of critical incidents and a theoretical sampling procedure that focused on the written utterances within one task. This task was chosen since it could provide rich information about the phenomena of written online educational communication (Jones, 1999; Patton, 2002). Further, these

tasks embraced the full range of online performances — synchronous as well as asynchronous — likely to be encountered on the course.

The data comprised written online utterances such as study-guides and syllabuses, and postings exchanged within the study-groups and between students and teachers. These utterances were seen as constituent aspects of the inter-personal computer-mediated communication (e.g., Buzzelli, 1996; Mercer & Wegerif, 1999; Wertsch, 1998).

Communicative features such as chat rooms, computer conferences and e-mail furnish the utterances examined in this study. They were recorded within the LMS (FirstClass) and, to a lesser extent, within web-based chat (e.g. Yahoo Messenger). Within the LMS, much of this record-keeping was linked to a range of conference sites which were designed to provide opportunities for student collaboration, submission of task documents, sourcing of course documents and the exchange of links to web-sites and other software. In addition to exchanges within the LMS, the course included three face-to-face meetings that introduced students to the content and structure of the course. These sessions were not recorded.

The empirical illustrations are taken from a collaborative task, an online seminar divided in two sections: preparatory work and seminar. The textual material related to the task consisted of approximately 190 pages comprising 44 000 words and 1000 utterances.

Environment and Education

As discussed above, interactional and transactional approaches to human action emerge from different positions of understanding the relation between man and the environment. From this we could also discuss consequences for understanding human action in education, particularly participation in education through CMC. In the interactional approach dualistic claims of participation in education are possible. Ontologically it is possible to separate man from the environment. From this dualistic assumption it follows that man and the environment are separate elements that can be understood independently without reference to each other. A consequence of such dualistic reasoning is that there also is possible to discuss the environment in terms of several different environments. The interactional ontology allows the appearance of such different environments. We can consider that agents are simultaneously performing actions in a world divided into different environments, for example geographical environments, physical environments, psychological environments, and social environments. Another environment frequently discussed in the research and practice of online education is the learning environment (e.g., Anderson, 2009; Merriënboer & Kirschner, 2007; Moreno & Mayer, 2007). Consequently, if we assume that there is more than one

environment, we also accept a fragmented view of online education there the learning environment is separated from other environments.

From a transactional approach a dualistic separation of man and the environment is unreasonable if a more coherent and dynamic understanding of education is sought. Man and the environment are aspects of and belong to a common whole that is not possible to divide. This means that man participates in a single integrated environment, an environment that embraces aspects of, for example, geographical, physical, psychological, and social features. Discussions of different environments, such as geographical environments and learning environments, in education are therefore not compatible within a transactional approach. Transactional approaches need to find other concepts for discussing participation in online education. These concepts must be compatible with a dynamic and holistic view of the relation between man and the environment.

Environment and Technology

Interactional conceptualisations of online education afford discussions of different environments. Therefore we could discuss educational practice, for instance, in terms of online learning environments (OLE) or virtual learning environments (VLE). However, this conceptualisation raises ontological questions on the relation between the technology and these environments. This discussion is illustrated with an excerpt from the online course.

Excerpt 1: An asynchronous exchange of utterances during the preparatory work for the online seminar.

Anja (The 9th of April, 08:55:17) Good, I am available anytime. Another thing, Last night I read that we should use Yahoo Messenger (I don't know anything about it, and some of us had problem with it last Monday) otherwise the seminar will be performed through telephone. That will not suits you too well (Karla) though you have to pay for 90 minutes international call to Sweden? Should we ask if we could use this forum instead, posting and replying to each others emails(together with the teacher). Alternatively, do you have another suggestion?

Karla (The 9th of April, 10:20:13) I am grateful for not having to sit by the phone during 90 minutes — it will be expensive! I am happy to perform the seminar in this forum. Will you check with the teacher or should I do it? Think that we are so lucky to have such a wise Anja in our group. Hugs Karla

According to the study guide, one of the assessments was performed at a seminar. The performance of this seminar was flexible according to location, time and technology. Students were offered to choose between couples of points of time, and decide if the seminar should be located at campus or online. If they choose to perform it online, they had to choose what kind of technology they should use. Two of the three groups participated through Yahoo Messenger. The third group also discussed chatting, but reconsidered when the teacher suggested a telephone conference as an alternative in the event of troubles with the technology. Telephone conferences are expensive if you live abroad, which Karla did at that time. This was noticed by Anja, who mentioned it to Karla. To be on solid ground both economically and technologically, they asked the teacher to run the seminar through a FirstClass-based electronic conference. The excerpt above illustrates that the conditions for using the technology differ between the students. These differences relate to aspects such as access, experience, and skill. Moreover, the teacher identified the technological solution that had been chosen as itself problematic. When discussing the threaded discussions used during the electronic conference he said that the *"delays were worse for those of you that use the web-version than for me as a client-user."* However, if we understand this educational situation in terms of an online learning environment (OLE) or virtual learning environment (VLE) we encounter problems while we limit our understanding of what is included in the virtual or online space. The existence of these learning environments depends on a technology. A technology that needs to be up and running for the environment, which Anja referred to as being problematic. Therefore, this limitation yields questions about how technologies operate in education. From a transactional approach these issues are important in attempting to reach a coherent understanding of the situation. Nevertheless, from an interactional approach these issues of technology and environment raised by Anja and Karla may be de-emphasised as less relevant for understanding their action.

In a transactional analysis we could take it one step further and challenge the interactional approach by raising the question of what happens with the OLE when the technology fails? Without the technology these environments did not exist and are impossible to create and shape. Outside the technology they could not appear. This raises issues of the ontological status of these environments. Is there any difference between the technology and the OLE? It is a tricky question to make a distinction between these concepts. If we admit that these environments are understandable without reference to the students and teachers that use them we made a dualistic claim. The consequence of this is that we also say that the OLE is the same as the technology. This makes the concept OLE unnecessary; instead the concept technology is more appropriate to use.

Further, this focus on the OLE also emphasises the role of technology in solving educational problems. A departure in the technological opportunities is

problematic since “if we are always technology-led we get sub-optimal solutions” (Laurillard, 2008, p. 139) to these problems. To get the best solution we first need to understand the educational problem. Consequently, the educational problem that the excerpt above illustrates should not be discussed in terms of technology. The identification and reflection from the teacher about the educational problem of using different technologies focuses on getting a suitable solution that insures that all participants get access to the seminar. This solution includes conditions for the performance of communication from both the teacher as well as all the students in the study group. The educational problem needs to be superior to the technological solutions.

However, if we take an interactional stance and argue that learning environments in online courses are not the same as the technology we must at least admit two things; that OLEs are totally dependent on the technology for their existence and that these OLEs also need to reference the students and teachers that use the technology. If we take a closer look at the implementation of technology in an online course, we will see that the course embraced different technological solutions to support communication between agents and the performance of their different actions by the agents. Two of the seminars were performed through a chat and the third through an electronic conference. However, if the OLE is understandable as something other than the technology, it needs to reference the students and teachers that use the technology. Then the OLE will become a tool, a conceptualisation of technology that embraces its use by humans (e.g., Wertsch, 1998; Vygotsky, 1978).

A tool is a non-dualistic transactional concept that mediates human action. The function of tools “is to serve as the conductor of human influence on the object of activity” (Vygotsky, 1978, p. 55). Agents use and extend “tools and practices inherited from previous generations. As people develop through their shared use of cultural tools and practices they simultaneously contribute to the transformation of cultural tools, practices, and institutions” (Rogoff, 2003, p. 52). Therefore the tool is a concept that emphasise the inseparability between the agent and the environment. This means that if we discuss technology with reference to human action the OLE will, whether we want it or not, become a mediating tool for the performance of human action. In the illustrating online course tools were a crucial feature of their operation. While participants took an online course the performance of their collaborative action, such as in the seminar, were conditioned by the technology. In other words, what we call learning environments cannot be distinguished from the concept of tools. Or, as Lillefjord and Dysthe (2008, p. 80) emphasise, such courses are about “text production with a VLE as a mediating tool”. Therefore, it is more appropriate to discuss the above-mentioned technological solutions in terms of tools instead of online or virtual learning environments.

A conceptual discussion of technology from an interactional perspective is problematic. It is hard to tell the difference between learning environment, technology and tools. Therefore this paper suggests that online education should use concepts that links technology to human action, for example terms such as artefact, means, or tools. These concepts emphasises that human action needs technology for its performance. Nevertheless, even if the action of students and teachers are discussed in terms of being mediated by tools, we have not yet mounted an adequate challenge to educational conceptualisations that build on dualistic concepts such as “learning environment.” Aspects of this tool-mediated communication also challenge these interactive dualistic claims.

Environment and Communication

Education that physically separates agents from each other has a long tradition of employing new tools for communication. Research has shown that “nearly every communication medium has been adapted” (Anderson & Garrison, 1998, p. 101). To this tradition recent decades of technological development has added an extensive array of new communication tools. The deployment of such tools conditions performance of communication in different locations and for different purposes. In the online course studied in this paper, students and teachers used an assembly of tools, for example chat, e-mail, electronic conferences, and telephone conferences for different communicative purposes such as academic support, assessment, online seminars, and tutoring. They communicated with each-other between their homes, and within and between different campuses and study-centres. How could we understand this feature of online courses? From a dualistic conceptualisation of education this issue is not particularly problematic. In an interactional approach the actions of students are only dependent on what is happening online. The physical location of the students is of less importance. The environment is divided into at least two different environments, the physical environment and the online environment. Actions are defined as the interaction between students in the online environment. Learning is supposed to occur in this environment or at least through this environment. Therefore the online environment could be discussed in terms of online or virtual learning environments. From an interactional approach we could also argue that the each agent has a personal learning environment and that this learning environment geographically is based in their home. Communication in online courses could therefore be understood as being performed in as many learning environments as the number of participating students.

Nevertheless, if we still have the intention of using the concept of learning environment to understand communication in online courses it is a tricky question to understand the dualistic boundary of the particular learning environment.

However, whether each agent has a personal learning environment or belongs to a common OLE, the dualistic boundaries of these learning environments makes it a difficult task to use this concept in design and research of online education. Overall, an inclusion of features from the homes of the student extends the level of complexity of education. This complexity is ignored in an interactional approach. From a transactional approach personal aspects and features of students home is important for understanding actions in online courses. Therefore transactional approach solves this complexity by adding these features from the homes of the students to the conditions in the surrounding environment.

As discussed above the conditions for using tools in educational communication has changed. However this communication still relates to ontological and epistemological assumptions taken by agents of online courses. In the online course we have discussed, some of these assumptions were explicitly expressed in the study-guides. The course team declared that actions are processes that depend on social and cultural aspects of the surrounding environment, that knowledge develops through critical evaluation of information, and that steering of the learning process is a tool for enhancement of learning. However, the teachers are not alone in having particular assumptions about human action. Students also have assumptions that influence their actions. In the course different ontological positions were emphasised by participants in their way of communicating. Results from another study of the same empirical material showed that two different communicative genres emerged. These genres were linked to particular study-groups. It seems likely that the ontological assumptions within these groups influenced their approach to communication. One of these genres embraced participants taking a transactional approach to communication. This genre was student-centred and included students taking responsibility for communication. Mainly the communication within these groups had a dialogical functionality. Excerpt two below illustrates a dialogic pattern that is typical for the communication within this genre. This genre embraces communication between the agents, through the online features, as a tool for collaboration around both curricula and private issues. The responsibility for steering communication were shared between students and teachers in a patterns similar to the ID-pattern identified by Dysthe (2002). This pattern comprises initiation from the teacher followed by a dialogical exchange of utterances within the group of students (1–3, 5–11). The steering of this dialogical pattern involves both students (7) and teachers (4).

Excerpt 2: A synchronous exchange of utterances during the online seminar.

1. Marta (10:20:59): I am not sure if education should be compulsory for everybody, but everybody should be treated equally.
2. Betty (10:21:18): We can never require the same from all pupils ...
3. Betty (10:21:36): It is good to be aware of the conceptions of the pupils.
4. TEACHER (10:21:43): Should we really treat everybody equal, or should we respect everyone as an equal and act accordingly?
5. Eva (10:21:44): this means that a pupil with low expectations gets high quality attention when he or she is treated as equal to the one with high expectations.
6. Marta (10:21:58): Maybe not everybody needs to be good at maths. It seems like we are back on the educational goals of the pupil.
7. Andrea (10:21:58): But how do we today treat the pupils who perform badly academically but are good in practical training?
8. Betty (10:22:07): it is important to start with the pupil then help him or her to set reasonable and reachable goals.
9. Marta (10:22:20): Respect everybody. Differences facilitate the process of learning!
10. Eva (10:22:46): but not always.
11. Andrea (10:22:53): Yes, but the society of today has high academic expectations.

The other genre was teacher-centred and included students treating communication with other agents instrumentally and therefore they avoided extensive communication with other agents. As excerpt three below illustrates the teacher alone steered the exchange of utterances (12, 14, & 18). The students answered shortly (13, 15–17) and were less interested in following the thread from the co-students. To nurture and sustain the exchange, the teacher had to feed students with comments and questions. Alternatively, one student took the position of the teacher and the rest of the group treated this student as if he/she was the teacher. Overall the communicative patterns in this genre showed similarities to the IRE-

pattern extensively found in research of classroom communication (e.g., Buzzelli, 1996; Mehan, 1979). In this pattern the teacher initiate the discussion with a question, task or so on, followed by responses from students, finally the teacher evaluate this response. In the teacher-centred genre students' considered education as an individual endeavour.

Excerpt 3: A synchronous exchange of utterances, taken from the online seminar.

12. TEACHER (09:46:27): What do you think?

13 Kristen (09:47:55): hum. I believe that some people are conservative and have problems with new lines of thought...

14. TEACHER (09:48:16): and the rest of you?

15. Charlene (09:48:21): From my point of view the teacher must adapt to the learner's needs. For good and bad.

16. Marcus (09:48:23): interesting, I think the idea of competence is a given winner. It is all about finding new forms of assessment, not merely starting with how it works today.

17. Kristen (09:48:35):...then it is hard to use the available resources.

18. TEACHER (09:49:06): in general, how much time has a teacher for each student?

The emergence of these two different genres of communication in the studied online course reveals a problem for designing educational communication through online tools. The involved agents had different assumptions on human action that influenced their approach to communication and collaboration. These assumptions interplayed with the predetermined design of the online course. In this course it consisted of a well-considered design in so far as the teachers worked out a detailed plan of the course before the introduction of the course, including study-guides that describe tasks, assessments, tools, supposed communication and so on. However, if we believe that learning relates to the social aspects of the environment such as communication, design problems appear if we discuss design of online courses in terms of learning environments. If participation is defined as being performed in an online learning environment, the emergence of different genres reveals the problems of linking that particular learning environment to a preferred result of learning; for example, in terms of how particular features in the learning environment lead to a particular learning result. As this illustration shows

education is more complex than thinking in these terms. The empirical data reveals a complex view of actions in the online course. Aspects from students' social life and physical aspects of the environment extensively influence their actions in the online course. Therefore, aspects linked to both the educational organiser and the student are important for understanding why these two different genres emerged in the online course. These aspects could not be separated as in the case of discussing the performance of communication in terms of learning environments. Instead, education embraces interplay of different aspects.

Conclusion

In this paper human action, such as participation in computer-mediated communication, has been put under scrutiny. The investigation emphasised the ontological assumptions of two different approaches, interactional and transactional. The consequences for conceptualising online education were discussed.

To summarise: the message of this paper is that interactional approaches to online education face ontological challenges from transactional approaches. These challenges have their roots in how to understand the relation between human action and the environment. Interactional approaches emphasises a dualistic understanding of this relation. This understanding has subsequent consequences for participating in online education. Use of interactional concepts such as learning environment in the research and design of online education neglects problems related to the dualistic position of human action. Interactional approaches offer an individualistic view of human action where human beings are separated from the surrounding environment, including other humans. It also separates communication from cultural, ecological, historical, and social features of human life. This leads to understandings of online education that are open to critique from transactional approaches.

The focus of this transactional critique, as developed in this paper, emphasises differences in the understanding of how to relate both online and offline features of the environment to aspects of communication and technology. From a transactional approach online education is a boundless activity that needs to incorporate aspects of both online and offline character. Therefore, communication and technology needs to be understood in terms of being an aspect of this activity. This activity embraces that human actions, communication, and tools belongs to a common whole. An understanding of each of these aspects could only exist in the light of the other aspects.

From this it follows that conceptualisations of online education need to embrace suitable concepts that emphasises this character of being boundless. Such

conceptualisation can comprise concepts such as agents, computer-mediated communication and tools. A common feature of these concepts is that they center “on the individual’s ongoing transaction with meaningful features of the environment” (Heft, 2001, p. 7). Such conceptualisation should underwrite the idea that “the reciprocity of the environment and the person, is a central feature” (Heft, 2001, p. 7).

These concepts should therefore simultaneously relate to human action, and the environment. However, such concepts with a transactional character, for example CMC and tools are used in interactional approaches. Nevertheless, the logic of using these concepts in such approaches to design and research online education is unclear. While de-emphasising offline features of the environment interactional conceptualisations of online education face ontological problems of how to relate human action to communication and technologies. The use of concepts such as CMC and tools did not solve that problem. The ontological status of human action in general and participation in computer-mediated communication in particular is still unclear in such approaches. The transactional approaches offer a solution to these ontological problems. Since these approaches emphasises both offline and online aspects of the environment they seem to be more suitable to support a coherent conceptualisation of online education. Therefore, transactional approaches benefit a clearer understanding of online education than interactional approaches. This understanding could be utilised by designers and researchers of online education.

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