Learning as Communication:
Development and Validation of the Self-Directed Learning Model

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INTRODUCTION

This study examines the structural model of self-directed learning (SDL) and discusses how the communication process explains SDL. SDL and similar concepts of an active learning style have been studied for many years, but the findings of these studies have been scattered throughout several different fields. This study collects and organizes the elements of SDL inter-disciplinarily, and develops the model to explain the process of SDL as the way communication takes place.

SDL is usually considered as an independent process. However, educational studies, especially constructivism, have shown that learning happens through interaction. This interaction is not limited to face-to-face relationships; in fact, one cannot learn without communication. On the other hand, some communication studies suggest that communication itself is the process of meaningful interaction, which is also not limited to face-to-face relationships but with many other medium. Both are processes of change and understanding. The idea of "learning as communication" therefore offers a new approach to the discussion of SDL, which is a significant concern of the information and communication technology (ICT) society.

Since the topic of SDL has been central to many studies in various disciplines, the author reviewed the literature broadly and found that SDL is comprised of seven elements. To examine the elements of SDL, the author used the survey research to Japanese university students. First, the seven-element model was examined by confirmatory factorial analysis, as a result of which two elements were merged into one. Six elements were therefore determined to be the structure of SDL: media environment, interpersonal contacts, media switching, planning habits, self-monitoring, and critical thinking. Second, structural equation modeling confirmed that SDL, as described by these six elements, is statistically significant for learning outcomes. The present study demonstrates that the entire process of SDL is actually a process of communication, and highlights the importance of communication in education. It also suggests the possibility of further studies of learning as communication.

LITERATURE REVIEW

The inseparable relationship between communication and education has been demonstrated by researchers and educational practitioners in both Japan and the United States. In Japan, Hatano discussed the "education as a communication process" theory, and offered an approach for investigating educational experiences in the context of the communication process.

Though learning does not occur without interaction, many studies of SDL had studied only independent actions. This study relies on viewpoints like Hatano's to ensure that the interaction phase

of SDL is not ignored. In addition, our research depicts SDL as one conceptual model among many that have been widely used in communication science. As the communication model is used in practice as well as in research, if the SDL model is confirmed, people in many educational fields will be able to make use of results from numerous studies. Thus, this research discusses the composition of SDL in term of modeling, based on the learning-as-communication approach.

In numerous studies, SDL is defined as the process by which learners manage their own education through their own initiative, in many research domains. The key aspects of SDL were articulated as early the sixteenth century. In the field of educational philosophy, several works of Rousseau discuss the autonomy of learners, and reveal the importance of leaving learners to their own devices as they grow. Current studies of the connection between social networking services (SNS) or learning management systems (LMS) and independent learning has shown that learners still need autonomy to learn, even in this digital era.

History shows that SDL has been a field of research in almost every education-related domain. However, the list of elements that comprise SDL varies in the literature, with the learning content and the subject of each domain determining to some extent its view of SDL's structure.

The educational philosophy mentioned above gave rise to studies in language education, and produced research on students' best practices. In this field, self-directed learners are called "good learners," and "learner autonomy" is a firm goal. This led to new educational fields such as adult learning and media studies, including the practice of educational psychology and the development of educational technology. These new fields use SDL widely, though educational psychology addresses it somewhat differently. Its concept of self-regulated learning (SRL) has spread all over the world and has engendered practical research on the subject in schools and universities.

Because SDL is known by various names, research has produced multidisciplinary reviews. Originally, SDL was seen as being comprised of four elements: active communication, media use, routine learning cycles, and meta-cognition. However, as a result of broader literature reviews using an updated definition of SDL, these four were not sufficient to explain all the details, which are necessary if SDL is to be used in real educational situations. Moreover, the four elements do not share a common approach when trying to utilize them in practice. Preferably, each element should be stated in the form of an action verb, as is done elsewhere in the field of education, like Bloom's classification of learning. Expressing them as verbs on also fits the basic concept of this study: learning as communication.

Based on the earlier four-element classification of SDL, a new SDL model was proposed, breaking it into three elements. Then four more elements were articulated, and this is the seven-element SDL model this study examines. The seven components are as follows: creating active communication strategies, choosing appropriate media, obtaining appropriate media resources, managing motivation, creating habits to continue learning, applying critical thinking to what one learned, and monitoring one's own learning. To explore these seven elements, the author conducted seven separate analyses on each SDL element. This led to a finding that these seven behaviors are strongly connected to SDL, but

does not confirm that the entire SDL process is comprised solely of these elements. This indicates that more research is needed in this area.

METHOD

Because the elements of SDL still need to be verified, as shown in the previous section, two research questions (RQs) can be formulated at this point. RQ1: Do these seven elements show potential classifications for SDL? RQ2: As the hypothetical model is concerned that all seven elements make the same contribution to SDL, do all confirmed elements have a positive relationship to learning outcomes?

The cross-sectional surveys were distributed to classes in universities in the Greater Tokyo Area. With the cooperation of the professors and lecturers in six universities, 508 valid answers out of 549 responses were collected; 52.8% of the answers were from male participants, and the average age of the participants was 19.9.

The questionnaire was composed of five sections: a face sheet that included respondents' GPA; self-evaluations on learning; the proposed seven elements of SDL, described simply; the self-regulated learning scale developed by Fujita; and other scales to assess communication skills and subjective media literacy. In addition to the 42 questions, which asked the students directly if they agreed with the proposed seven elements of SDL, the questionnaire also asked for respondents' details such as GPA. All research ethical conditions were plainly articulated on the front page, and participants were assured that they were able to discontinue answering the questionnaire anytime they wished.

Analysis was done through structural equation modeling (SEM) to validate the model, using SPSS Amos for Windows software.

RESULT

In response to RQ1, exploratory and confirmatory factor analysis showed that six factors could be confirmed as SDL, not seven as proposed. This is the result of merging the motivation and habituation elements; the other elements were found to be consistent as suggested. One of the elements incorporated into the new model was "routine action to encourage self-improvement," which was one of the four SDL categories developed before the seven-element proposal. This result was therefore not an unexpected counterstatement, but a confirmation of the original proposal. The seven-element proposal made a distinction between trying to work on one's own psychology and caring about one's outer behavior, but in the context of communication process, these behaviors have same meaning: creating habits in order to continue the learning cycle.

Secondarily, in response to RQ2, the SDL model as it explains learning outcomes was confirmed through the structural equation modeling. It demonstrated that SDL leads leaners to higher learning outcomes, and showed that all six factors have a significant effect, with the model showing enough values that can be judged as good. In other words, the study found that an SDL model composed of the six proposed elements has a definite influence on learning outcomes, and that all six elements are

significantly related. The six elements therefore become strategies: establishing a media environment, creating interpersonal contacts, doing media switching, habit-planning, self-monitoring, and thinking critically.

Furthermore, it was found that the exogenous variables calculated from two other scales dealing with communication attitudes helps explain the process through which SDL leads to higher learning outcomes. While these two outside elements, which describe students' normal communication habits, do not have a direct impact on learning outcomes, they have an indirect effect on them. This also shows that SDL is not solely the process of independent learning, but the process of communication as a whole.

DISCUSSION

Based on the above results, the confirmed elements of SDL are not limited to certain subjects or research domains. These six elements explain the whole process of SDL in general. One element of SDL, for example, is to have many interpersonal contacts. This includes not only receiving learning advice but also includes any conversation with followers, so long as the contents are related to learning. This would mean that teaching or sharing the contents learned is an essential part of SDL—in other words, SDL is not a solitary process, but one that requires others. The second element is a strategy of media switching: it seems necessary to adjust one's learning media depending on the scene, including the ability to manage distractions. And it is also necessary to prepare the media environment so that is can be easily accessed. Social or economic impediments have to be removed so that the learning material can be accessed directly. Also, to continue the learning cycle, it is important to manage one's own motivation and plan one's learning behavior habitually. Another element of SDL is critical thinking. This is more of a content-based element than the other elements are. To organize the learning contents by oneself, and to approach new information armed with questions, especially concerning its implications, are indispensable tasks of SDL. Finally, self-monitoring is essential for SDL: continuing one's own learning, assessing one's degree of progress, and managing one's feelings toward learning, are vital aspects of SDL. While this also sounds like an independent process at first, adding this element as part of the SDL process suggests that it is a sort of decoding process similar to critical thinking strategies.

When the learning process is examined in conjunction with the learning outcome, a discussion of the differences in each element's influence is possible. For example, when the goal is higher learning outcomes at university, the learning process seems to have a strong influence. However, even when things are not directly related to learning specific content, SDL still has an impact. It is possible to state that elements that are deeply involved in the decoding process of communication have more impact than elements concerned with the approach phase of communication, though this is also important since this phase is needed to continue the process of SDL.

On the other hand, this research confirms the relationship between communication and learning—particularly in the whole SDL model. If one looks at the communication in all the processes,

learning as communication, as Hatano first introduced it, was confirmed. However, the current study shows that for self-directed learners, all communication is part of the learning process: the entire environment becomes a vehicle for learning something new. In further studies, it is expected to develop the model usability, as the model demonstrates the whole process of SDL as communication.

In short, this research summarizes the elements of SDL in a single model. Each element is taken as a concrete item that takes the form of actions and strategies and is easy to utilize in practical use. When studying communication as a form of learning, especially SDL, the sort of elements that are included in the process become clear. Based on these results, as research on learning as communication develops, we will see more discussion on what SDL is and how it works in actual learning environments.