

## 論文内容要旨

報告番号	甲 先 第 <b>171</b> 号	氏 名	李 萌萌
学位論文題目	Context-awareness and Personalization Using Ubiquitous Learning Logs 「ユビキタスラーニングログを用いたコンテキストウェアな個別学習支援に関する研究」		
内容要旨			
<p>In this doctoral dissertation, we mainly describe a context-aware and personalized learning model that is built on a learning log system called SCROLL. This study is done in the background of the prevalence of smartphones, which are equipped with several kinds of sensors. Therefore, how to make use of the sensors to support language learning and how to facilitate the mobile based note taking in language learning become the objects of this study.</p> <p>By doing the literature review on context-aware learning and personalized learning, we find that most researchers focus on how to offering the learners with the learning materials that are related to the context. But few of them employ learning context in other ways, such as taking the learning contexts as retrieval cues to help learners recall what they have learned. What's more, the value of the context history is not being investigated enough as well. Therefore, the model we proposed mainly contributes to these two problems. In this study, in order to take the advantages of learning context, the model can offer location-based reminder quizzes, recommend other learners' learning logs based on location and prompt learners to study according to his learning habits. In addition, because one objective of SCROLL is to facilitate learners to easily record and recall what they have learned, so in order to help them recall efficiently, the system design of SCROLL is on the basis of several theories and studies on human memory, like the environmental context effects, picture superiority effect, and testing effect and so on.</p> <p>To evaluate this study, three experiments were conducted to find answers to the following hypothetical questions.</p> <ol style="list-style-type: none"> <li>1) Does SCROLL contribute to more effective language learning than the paper and PC (personal computer) based learning method?</li> <li>2) Does the context-aware and personalized learning model we proposed serve the learner well?</li> </ol> <p>Through the experiments, we got two conclusions. Firstly, about SCROLL, we find that most of learners prefer to use this kind of tool for eff</p>			

efficient learning, because it not only can save learners' learning contents but also help them to recall them. Besides, the usability of our system satisfied most of the learners in the experiment III. However, we find that there are still some limitations of SCROLL. One limitation is caused by the hardware, such as the low speed of the 3G, the insufficient battery and the barrier of using smartphones. Another one is caused by the software, which restricts the format of the learning log. But with the evolution of the mobile technology and the prevalence of smartphones, these limitations will be improved in the future.

Secondly, the context-aware and personalized model really facilitates learners' learning. On one hand, as other researchers found, learners benefit from the recommendation of the learning materials related to the learner's contexts. On the other hand, utilizing the learning context as retrieval cues for learners to recall is also proved to be efficient. And the learning habits acquired by analyzing the context histories are also proved as a meaningful way to accommodate learners. However, the low response rate on the contextual recommendation needs to be improved and the inconvenience causing by the recommendation is also a challenge for us.

As for our future work, there are mainly three issues for us to explore. The first one is that in order to catch learners' learning contexts more accurately, more kinds of context elements and learning habits should be taken into account, such as learners' schedule. The second one is to provide learners with more control on both the recommendation actions and the predictions of the system. For example, learners can decide the alarm type of the recommendation. The third one is that we need to increase the attraction of other learners' learning logs and make the learner to participate in learning from others.

論文審査の結果の要旨

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<p>学位論文題目 Context-awareness and Personalization Using Ubiquitous Learning Logs ユビキタスラーニングログを用いたコンテキストウェアな個別学習支援に関する研究</p>			
<p>審査結果の要旨</p> <p>本研究は、センサー技術、ユビキタス技術を用いた学習環境における、コンテキストウェアな個人適応方式に関するものである。特にスマートフォンを用いて、学習者にとって、適切な時に適切な場所で適切な内容を提示する方式を提案した。この方法は、学習科学や記憶に関する理論を基に、学習者の過去の行動と現在の行動を分析して、学習内容の推薦を行うものである。Android端末を用いてシステムを開発し、実証実験にも成功している。</p> <p>以上、本研究は、ユビキタス学習環境において、新しく個人適応技術を提案したものであり、本論文は博士（工学）の学位授与に値するものと判定する。</p>			