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研究課題名(和文) Adaptive model for teaching strategy of computer literacy in a multicultural environment  
研究課題名(英文) Adaptive model for teaching strategy of computer literacy in a multicultural environment  
研究代表者  
VASILACHE SIMONA (Vasilache, Simona)  
筑波大学・システム情報系・助教  
研究者番号：30606934  
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研究成果の概要(和文)：この研究では、多文化環境におけるコンピュータリテラシー教育戦略の適応モデルを開発しました。我々のモデルは、文化特有のクラスの好み、LMS (Learning Management System) の認識、生徒のレベルの格差など、クラスの条件に適応できます。また、コンピューターリテラシーのクラスを教える際の文化の違いの重要性を理解する事に役立ちました。

#### 研究成果の学術的意義や社会的意義

This research helped to understand the importance of cultural differences when teaching computer literacy. It highlighted the need of an adaptive teaching approach, tailored to the needs of students from various cultural backgrounds and with various knowledge levels.

研究成果の概要(英文)：This research developed an adaptive model for teaching strategy of computer literacy classes, helping to understand the importance of cultural differences when teaching computer literacy classes. Our model can adapt to class conditions such as culture-specific class preferences, LMS awareness, and student level disparities.

研究分野：computer literacy education

キーワード：computer literacy multicult. environments cultural differences

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## 1 . 研究開始当初の背景

As an integral part of general education, computer literacy (CL) education has an important role and related courses are offered in many high-level institutions. In case of multicultural academic environments, several factors make CL education difficult. First, the CL knowledge levels of international students from various countries vary a lot: they have different literacy levels and various personal experiences with information technology. Second, because many kinds of learning management systems (LMS) are used in education in the world, the LMSs that the international students experienced in their previous CL education varies significantly. Finally, cultural differences affect the teaching and learning process in many ways. While cultural differences are taken into consideration in more and more fields, their impact in teaching CL in particular remains poorly understood. The current methods of teaching CL classes do not consider cultural differences and they cannot suitably accommodate the large variety of students.

## 2 . 研究の目的

The purpose of our research is to develop a model for teaching strategy which addresses the lack of attention given to CL education, in particular in multicultural contexts. Our research aims to identify cultural aspects of computer literacy education, in relation to: a) teaching style and course structure; b) use of learning management systems. We believe that, by addressing cultural differences in teaching computer literacy, the performance and level of satisfaction of students can be significantly improved.

## 3 . 研究の方法

We started work on this project by focusing on the students' perceptions of CL classes. We based our results on data gathered after 2015 while teaching CL related classes at the University of Tsukuba, with students from more than 25 different countries. Through class surveys and questionnaires, we identified international classroom perceptions, differences in teaching style and learning, effects of cultural differences on communication with peers/teachers, difficulties in group work etc.

Furthermore, during a visit at a higher-education institution abroad, with a large number of international students, questionnaires and interviews were conducted and two peer-teaching sessions took place. This work highlighted the perception of students with regard to cultural differences in international classrooms. The results showed that students are undoubtedly aware of these differences and, furthermore, they believe that these differences are relevant when learning CL, as much as they are when learning any other subject.

We continued our work with the development of our model for teaching strategy. We identified cultural aspects of computer literacy education, in relation to: a) teaching style and course structure; b) use of learning management systems. We investigated how cultural differences manifest in CL education and we identified the effects of these differences on student preferences for particular class formats, teaching styles, examination methods etc.

At first, we focused on the general course structure and class style. The initial class structure can be determined by several factors, as shown in Fig. 1a. The style employed in the subsequent classes is shown in Fig. 1b. As the course progresses, the instructor can observe the development of the class and can regularly receive feedback from the participating students. This allows a continuous adaptation and improvement of class style.

Next, the role of the LMS was identified and adapted. Choosing the LMS feature appropriate for each class can be considered from two points of view: timing and target users. On one hand, they depend on the flow of the course and, on the other, on the preferences of students/faculty members. These preferences can be experience-dependent, culturally influenced or performance-dependent. Choosing the LMS feature appropriate for each class can be decided based on previous classes' results, surveying the students or personal decision based on other factors.

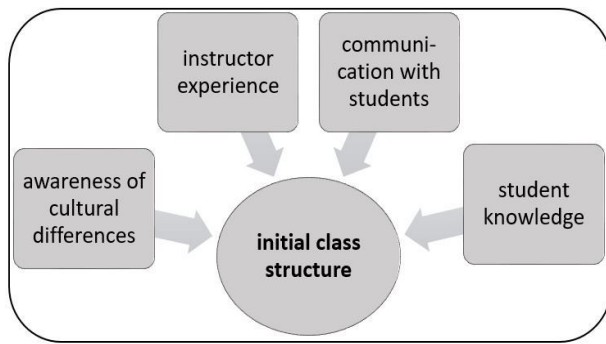


Fig. 1a: Initial class structure

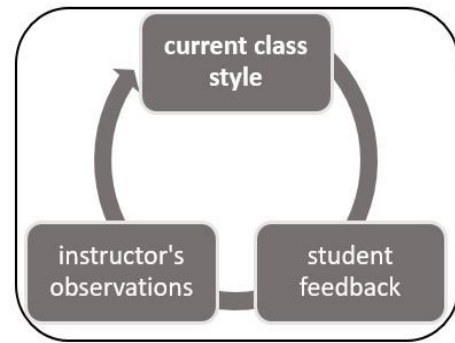


Fig. 1b: Determining class style

The model was compared to the previous method of conducting classes in terms of:

a) academic performance of students (as resulting from their grades, assignment completion rate etc.); b) level of satisfaction of students (as resulting from questionnaires administered to students at the end of the course). The model was modified and improved according to the feedback received and it highlighted the importance of a culturally responsive teaching strategy, to be adopted in CL education.

#### 4 . 研究成果

We developed an adaptive model for teaching strategy of CL classes which is adaptable to the class conditions: cultural-specific class preferences, perceptions of LMS and disparities in students' levels. The model is concerned with the following aspects: course planning, course implementation, in-class activities, outside-class activities, assignment style and frequency, evaluation style, LMS features, as well as performance and level of satisfaction of students. Throughout the course, quantitative, as well as qualitative analysis is made possible. This helps in adjusting and adapting the class style and the manner of using the adopted LMS. At the end of the course, lessons can be learned and incorporated in the current framework, so that the instructor can make use of the new information and continuously improve the model. We believe that our work can be significant for the CL education at the university level. In the current internationalization context, the needs of students from various cultural backgrounds and with various knowledge levels can be considered and fulfilled.

## 5. 主な発表論文等

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3. 雑誌名 Ao SI., Gelman L., Kim H.K. (eds) Transactions on Engineering Technologies, Springer, Singapore	6. 最初と最後の頁 121-131
掲載論文のDOI（デジタルオブジェクト識別子） 10.1007/978-981-15-8273-8_10	査読の有無 有
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[学会発表] 計6件 (うち招待講演 3件 / うち国際学会 4件)

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〔図書〕 計0件

〔産業財産権〕

〔その他〕

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6. 研究組織

	氏名 (ローマ字氏名) (研究者番号)	所属研究機関・部局・職 (機関番号)	備考
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7. 科研費を使用して開催した国際研究集会

〔国際研究集会〕 計0件

8. 本研究に関連して実施した国際共同研究の実施状況

共同研究相手国	相手方研究機関
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