

# Preface to Volume 3: The Potential of One Tablet Per Student for Supporting Individualized Learning and Collaborative Learning

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## 1. Introduction

*Information and Technology in Education and Learning* (ITEL) is a joint international journal published by two academic societies in Japan: the Japan Society for Educational Technology (JSET) and the Japanese Society for Information and Systems in Education (JSiSE). ITEL is dedicated to disseminating unique research findings to professionals worldwide who are engaged in research on educational technologies, as well as advancements in the theory and methodologies pertaining to the use of computers in education. It operates as an open-access journal, with J-STAGE as an online publication platform.

Given the interdisciplinary nature of educational technologies and information systems, ITEL encompasses a wide range of topics within the realm of education and learning technology research. This includes various fields such as the humanities, social sciences, natural sciences, engineering, learning sciences, educational psychology, and other disciplines related to human behavior. Additionally, ITEL covers aspects of information science, including databases and artificial intelligence, along with cognitive science.

## 2. Invited Papers

The theme of this volume is “The Potential of One Tablet Per Student for Supporting Individualized Learning and Collaborative Learning.” In particular, the accepted papers provide an overview of individualized and collaborative learning supported by learning analytics, AI, and big data collected through the user’s PC. We have selected four invited papers that will guide us in providing enough support for personalized and col-

laborative learning on one PC per student. We thank the authors of this manuscript.

Yang *et al.*<sup>[1]</sup> explored learning analytics and educational data mining, focusing on improving learning outcomes. By analyzing data from MOOCs, they examined student learning patterns and interventions, revealing their impact on outcomes and Self-Regulated Learning (SRL) abilities. The experimental findings provide valuable insights into learning outcomes and SRL variations, offering tailored explanations for specific student groups and enhancing the understanding of effective learning strategies.

Lee *et al.*<sup>[2]</sup> reviewed AI and learning analytics projects in Singapore’s education system, categorizing initiatives according to the technology type. These projects include personalized learning, improved student engagement, resource optimization, and prediction of educational outcomes. They outline each project’s impact, limitations, and implications for Singapore’s education. They emphasize the need for continuous research and development to fully utilize AI and LA technologies to improve teaching and learning experiences.

Cho, the author of the third invited paper<sup>[3]</sup>, investigated South Korea’s ICT landscape in schools, focusing on the One PC per Student Initiative. He reported that, despite advanced digital infrastructure, low device-to-student ratios, and limited ICT use resulted from a teacher-centered approach, hindering personalized learning. He concluded that overcoming this requires improving teachers’ skills in creating personalized learning plans, offering tailored guidance, and promoting collaborative learning.

Horita and Nagahama, the authors of the last invited paper<sup>[4]</sup> undertook three main tasks: examining the progression of digitalization in elementary and secondary education in Japan, outlining the current educational policy’s focus on personalized learning, and

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synthesizing the outcomes of educational technology research up to the present day. They report that recent research findings on self-regulated learning have been applied in both elementary and secondary education.

### 3. Research Papers

For this volume, we reviewed 18 submissions (excluding translations and invited papers) and decided to publish six research papers (Regular Paper: 3, Short Paper: 3) under strict and prudent review. The selection rate was 33.3%. In addition, we have published seven translated papers in *Japan Journal of Educational Technology*.

Furuta and Knezek, the authors of the first regular paper<sup>[5]</sup>, employed hierarchical word clustering and the TF-IDF measure to analyze computer programming articles from the 1970s onwards. This research, aligned with established programming education literature trends, emphasizes the significance of text mining for valuable insights in the field.

Kuromiya *et al.*, the authors of the second regular paper<sup>[6]</sup>, introduced a reflective teaching workflow using learning analytics and the LEAF (Learning Evidence and Analytics Framework) platform, aiming to create evidence from routine data. To demonstrate the practical application of this reflective teaching workflow, they presented a case study of a high school math class in Japan. They discussed the implications of this reflective workflow, emphasizing its potential to create comprehensive evidence in the LEAF system, which could lead to the democratization of evidence-based practices in classrooms.

Yasuda and Ogata, the authors of the last regular paper<sup>[7]</sup>, presented a novel method for preventing proxy test-taking during online examinations using tablet devices. It authenticated the examinees' identities through diverse touch gestures, demonstrating superior performance with the support vector machine classifier, even with varied gestures and screen positions. This method allows the use of hand-shaped images from different angles for authentication. Future work will refine the setup to simulate real examination conditions and explore touch gestures at arbitrary points on a tablet screen for authentication purposes.

Matstushima and Ozaki, authors of the first short paper<sup>[8]</sup>, investigated the effects of open-ended questions and class preparation guidance on 42 university

students in an educational psychology class. The interventions resulted in higher learning strategies and class engagement scores, particularly benefiting students with low intellectual curiosity and highlighting their positive impact on engagement and learning strategies.

Sha *et al.*<sup>[9]</sup> explored the relationship between student participation in peer review activities and open-ended tasks in online classes. Utilizing both synchronous and asynchronous communication tools, students collaborated in small groups to create Open Educational Resources. Their contributions were assessed using self-reports and questionnaires. These results underscore the significance of active involvement in peer review activities in online learning environments, combining synchronous and asynchronous communication tools to enhance the completion of open-ended tasks.

Matstushima and Ozaki, the authors of the last short paper<sup>[10]</sup>, examined the influence of class orientation and academic engagement on students' fulfillment and self-growth in university. A survey of 212 students revealed that autonomous class orientation that valued interesting but challenging classes enhanced cognitive and social engagement. They concluded that this heightened engagement led to increased fulfillment in learning and self-growth at the university.

### 4. Toward the Next Volume

In this preface, we briefly describe the status of the submissions and reviews in Volume 3, as well as the main published papers. We hope to receive more submissions for Volume 4 from a wider range of countries in a variety of research fields. The theme of the next volume will be "Personalized Learning Environments," but not limited to this topic; we always accept good-quality submissions to ITEL.

Finally, all editorial board members of Volume 3 deeply appreciate all the readers, members, and non-members of the JSET and JSiSE for their tremendous contributions.

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