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研究課題名（和文）A Pilot Study for Improving Engagement and Motivation In Language Learning

研究課題名（英文）A Pilot Study for Improving Engagement and Motivation In Language Learning

研究代表者
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研究成果の概要（和文）：本研究では、以下7つの目的を達成した。1)言語学習者のa)認知的、b)行動的、c)感情的エンゲージメントの尺度の開発。2)学習者が自らのエンゲージメントレベルを記録するためのコンピュータ等で使用するウェブベースのアプリケーションの開発。3)教師(および研究者)が学習者にエンゲージメントレベルの提出を求めるためのウェブベースのダッシュボードの開発、エンゲージメント測定が行われた指導の背景に関する詳細の記録、回答のリアルタイムでの閲覧。4)実験的研究を通じたエンゲージメント測定値の検証。5)妥当性と実用性の確認。6)一流Q1国際査読付き学術誌での研究結果の発表。7)将来のアプリ開発の機会の特定。

研究成果の学術的意義や社会的意義
We have shown that it is possible to use experience sampling to obtain valid & reliable live learner insights. At a practical level this can be conducted with minimal disruption to classroom practices, which has major implications for the use of engagement tracking in classroom environments.

研究成果の概要（英文）：The project has met its intended objectives. Primarily, these were to 1) develop a measure of language learner a) cognitive, b) behavioural, and c) emotional engagement; 2) develop a web-based application for use on computers, tablets and mobile phones by learners to record their engagement levels; 3) develop a web-based dashboard for teachers (and researchers) to a) request learners to submit engagement levels, b) record details about the instructional context in which the engagement measure was obtained (e.g. type of lesson, type of activity, type of interaction), and c) view the responses in real-time; 4) validate the engagement measures through an experimental study; 5) confirm validity and practical application through a practice-based usage study; 6) publish the results of the studies in top-tier Q1 international peer-reviewed journals; 7) identify opportunities for future development of the application.

研究分野：language education

キーワード：learning analytics　online learning tools　language learning　enhancing engagement　engagement variables　second language learning　engagement measuring

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様　式　C－１９、F－１９－１、Z－１９（共通）

１．研究開始当初の背景

Our research is centred around the concept of engagement in language learning, a phenomenon distinguished by its multidimensionality, dynamism, context-dependency, and intrinsic connection to motivation. Historically, researchers evaluated engagement by observable behaviours like attendance and classroom participation, assuming these were tangible manifestations of motivation (Liem & Martin, 2012; Mercer, 2019). However, contemporary studies propose a multi-faceted model of engagement, incorporating behavioural, cognitive, social, and affective dimensions (Philp & Duchesne, 2016; Svalberg, 2009; Reeve, 2012). Engagement is susceptible to fluctuations due to numerous internal and external factors, making it potentially amenable to pedagogical interventions.

While engagement measurement often employs self-reported data (direct metrics) or tangible measures like attendance data (consequential metrics), the reliability and validity of these methods have been questioned. These techniques may fail to accommodate the dynamic and evolving nature of engagement (Fuller et al., 2018; Fredericks & McColskey, 2014). In response to these limitations, we introduced an experience sampling method (ESM), utilising a mobile application named Classmoto (see Figure 1), which we designed for this project. This approach aimed to validate the app as a measure of L2 engagement and investigate its efficacy in capturing its cognitive, behavioural, and emotional subtypes, advancing our understanding of engagement and informing pedagogical strategies for effective language learning.

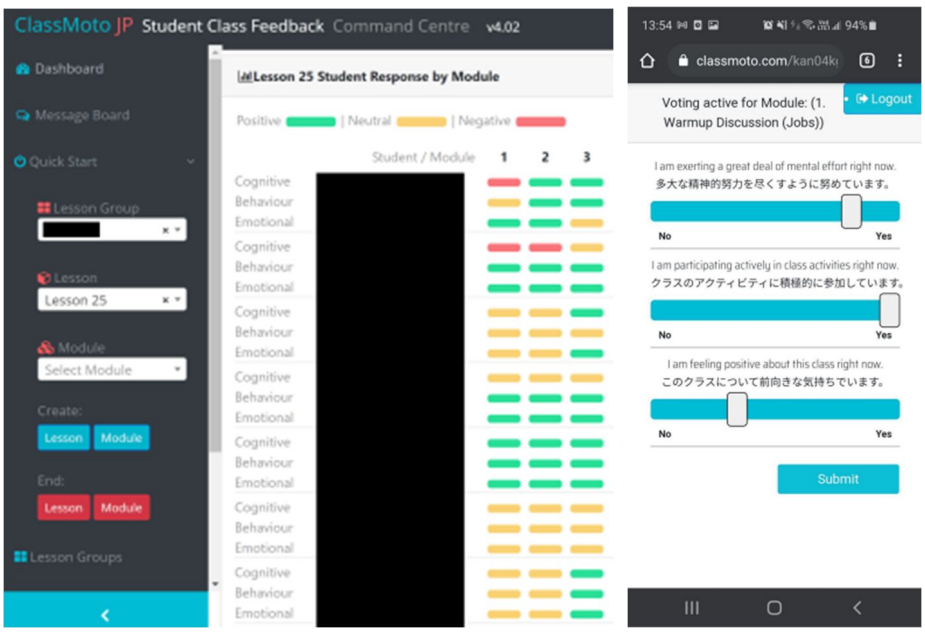

Figure 1: The Classmoto application teacher view (left) and student view (right).

２．研究の目的

Our research explored the multifaceted nature of engagement in second language (L2) learning by introducing an innovative, real-time measuring approach. Our objectives were twofold: to validate Classmoto and its effectiveness in capturing cognitive, behavioural, and emotional engagement, and to demonstrate that it is possible to obtain real-time measures of engagement with minimal disruption to classroom proceedings.

Traditional measurement methods might have fallen short in accurately capturing dynamic shifts in engagement. Classmoto countered these shortcomings by allowing real-time student feedback, mitigating later recall bias issues, and minimising disruption to the learning process. The successful validation and implementation of Classmoto has the potential to substantially advance the field of language learning engagement. This could facilitate more tailored strategies and interventions to boost student engagement, potentially enhancing L2 learning outcomes. The research aimed to enrich current L2 engagement frameworks and provide a novel tool for educators to gauge and nurture student engagement, contributing to a more effective and meaningful language learning experience.

3．研究の方法

With our research project being anchored in the validation of Classmoto and its efficacy in capturing its cognitive, behavioural, and emotional engagement, we designed the mobile application and conducted numerous pilot studies into its implementation into individual courses and surveyed students on their thoughts and reactions to its implementation.

The first stage of the research, prior to the implementation of the measurement application, involved designing an effective engagement-related data collection method. An initial 12-item pilot survey, focused on cognitive, behavioural, and affective engagement, was refined following expert review, and then tested on a group of 250 Japanese university students using principal component analysis (PCA). The PCA results indicated three factors corresponding to cognitive, behavioural, and affective engagement domains.

The second stage of the research involved taking those three factors and developing and testing the Classmoto app, which would use them to assess real-time engagement levels. Three feedback statements were designed based on the engagement domains: “I am participating actively in class activities right now”, “I am feeling positive about this class right now”, and “I am exerting a great deal of mental effort right now”. These statements were paired with a likert-scale style slider that would allow students to indicate their level of agreement or disagreement with each statement when requested by the teacher (see Figure 1, right side). This system was then implemented into the web-based application.

Designed to be flexible, scalable, and cost-effective compared to existing data collection applications, Classmoto was first tested with an individual class of students in an intermediate-

level English language acquisition course at a large private university in Japan, with multiple data collection points throughout each lesson of the course. Once feedback was collected and the application adjusted, teachers were recruited and the application was implemented into multiple courses over the entire academic year conducted by four teachers at the university. Students were informed about the purpose and functionality of the app, and trained in its use. The training included students seeing example feedback responses to specific scenarios and then trying the application out in mock feedback opportunities to check for understanding. Participation consent was then obtained.

At the conclusion of the courses, students and teachers were given opportunities to provide feedback on the application itself, which we published as (Measuring real-time learner engagement in the Japanese EFL classroom, 2022). The feedback data itself was analysed to assess Classmoto's efficacy in capturing accurate, real-time engagement data, which we published in (Tracking learner engagement in the L2 classroom with experience sampling, 2023).

４．研究成果

The results of our project suggest that the project has met its intended objectives. Primarily, these were to:

(1) develop a measure of language learner a) cognitive, b) behavioural, and c) emotional engagement, and;

(2) develop a web-based application for use on computers, tablets and mobile phones by learners to record their engagement levels live;

Additionally, with Classmoto, we observed a gradual decline in students' reported engagement. This fluctuation showcased the dynamic nature of engagement, which was accurately captured by our tool. The wide standard deviation distribution at each data collection point provided further evidence of Classmoto's validity, indicating that the questions were effectively capturing students' real-time cognition, and that students were responding honestly.

Our study validates prior research that single-item scales, like those used by Classmoto, can be effective when long scales are impractical. Classmoto's use could significantly influence classroom engagement research, providing real-time data, and offering insight into student language learning experiences, which could aid educators in tailoring classroom activities.

The study also identified areas for further research, including the inclusion of qualitative measures of learners' experiences with Classmoto, and the potential addition of social engagement measures. Moreover, our strategy to reduce each engagement sub-construct to a single item for less disruption opens avenues for future research to refine this process, minimising disruptions even further. Thus, our project provides a significant stride forward in assessing real-time student engagement, offering considerable opportunities for future enhancement and application.

５．主な発表論文等

〔雑誌論文〕　計2件（うち査読付論文　2件／うち国際共著　2件／うちオープンアクセス　1件）

１．著者名 Bonner Euan、Garvey Kevin、Miner Matthew、Godin Sam、Reinders Hayo	４．巻 NA
２．論文標題 Measuring real-time learner engagement in the Japanese EFL classroom	５．発行年 2022年
３．雑誌名 Innovation in Language Learning and Teaching	６．最初と最後の頁 1〜11
掲載論文のDOI（デジタルオブジェクト識別子） 10.1080/17501229.2021.2025379	査読の有無 有
オープンアクセス オープンアクセスではない、又はオープンアクセスが困難	国際共著 該当する

１．著者名 Reinders Hayo、Lee Bradford J.、Bonner Euan	４．巻 2
２．論文標題 Tracking learner engagement in the L2 classroom with experience sampling	５．発行年 2023年
３．雑誌名 Research Methods in Applied Linguistics	６．最初と最後の頁 100052〜100052
掲載論文のDOI（デジタルオブジェクト識別子） 10.1016/j.rmal.2023.100052	査読の有無 有
オープンアクセス オープンアクセスとしている（また、その予定である）	国際共著 該当する

〔学会発表〕　計2件（うち招待講演　0件／うち国際学会　1件）

１．発表者名 Bonner Euan, Miner Matthew, Godin Sam
２．発表標題 Reflections on the Creation and Implementation of an Application to Measure and Respond to Real-time Student Engagement Levels in Language Learning Classrooms
３．学会等名 CALICO 2022（国際学会）
４．発表年 2022年

１．発表者名 Bonner Euan, Garvey Kevin, Godin Sam
２．発表標題 Developing and piloting an application for measuring real-time learner engagement levels in foreign language classrooms
３．学会等名 JALTCALL 2022
４．発表年 2022年

〔図書〕　計0件

〔産業財産権〕

〔その他〕

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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