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研究課題名 (和文) An Investigation into High-Feedback Engagement Factors in  
Technology-Enhanced-Learning Materials that tap into the OCEAN Personality  
Traits of ESL Learners

研究課題名 (英文) An Investigation into High-Feedback Engagement Factors in  
Technology-Enhanced-Learning Materials that tap into the OCEAN Personality  
Traits of ESL Learners

研究代表者

Robert Cvitkovic (Cvitkovic, Robert)

東海大学・国際教育センター・講師

研究者番号：00412627

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研究成果の概要 (和文) : この研究では、アプリの利用パターンと人格クラスター-具体的には達成努力、自己規律、能力-の間の相互作用が、被験者が教育用英語アプリの価値をどのように評価するかの指標となることを示しています。教育用アプリの利用パターンと、良心的なファセットの5つのクラスターと英語力の間には、有意な相互作用がある。すべての英語能力レベルにわたって、アプリの価値を他のクラスターよりも有意に高く評価するファセットのクラスターがある。

研究成果の学術的意義や社会的意義

There are significant interactions between educational app usage patterns, five clusters of the facets of conscientiousness and English ability. There are facet clusters that rate app value significantly higher than other clusters across all English proficiency levels.

研究成果の概要 (英文) : The aim was to determine the degree of correlation between perceived app value and 1) OCEAN five dimensions of personality, 2) six facets of conscientiousness, 3) five English proficiency levels, 4) educational app usage patterns, and 5) regulation autonomy index (RAI). Multiple linear regression results showed significant positive correlations between app value and English proficiency, RAI, and app usage patterns. Furthermore, significant positive correlations also were found when personality traits were grouped using cluster analysis. A 3-way independent ANCOVA revealed significant interactions between educational app usage patterns, five clusters of the facets of conscientiousness and English ability. Two points stand out, 1) there are facet clusters that rate app value significantly higher than other clusters across all English proficiency levels, and 2) subjects with high usage patterns rate app value statistically higher irrespective of English proficiency level.

研究分野 : Effectiveness of English Learning apps

キーワード : Personality traits MALL elearning feedback

## 1. 研究開始当初の背景

In recent years, the list of books and articles that suggest the powerful learning potential of technology enhanced learning (TEL) materials has increased (Edery & Mollick, 2008; Fletcher & Tobias, 2006; Gee, 2007a; Gee & Hayes, 2010, 2011; Ke, 2008; Vogel et al., 2006) but strong empirical evidence to support many of the claims are fragmented, and often inconclusive (Hayes, 2005; Vogel et al., 2006). Research that does exist indicates that TEL materials can have a positive impact on affective and motivational outcomes (Przybylski, Rigby & Ryan, 2010; Rigby & Ryan, 2011; Jennett et al., 2008; Weibel, et al., 2008), knowledge acquisition (Beale et al. 2007; Papastergiou, 2009), social/soft skills (Backlund, 2008) as well as other learning outcomes (Hogle et al., 2008). However, there are no quantitative studies that correlate personality traits with TEL engagement features and then determine which TEL features produce the highest learning gains in the various student personality clusters.

One appeal of TEL materials is its capability to give specific customized feedback about learner performance in auditory, textual and graphical forms (Butler & Winne, 1995; Hattie & Timperley, 2007; Rigby & Ryan, 2011). Another appeal is increased engagement, which promotes deep learning (Ainley, 2011). Several high quality studies have been carried out in educational contexts but are heavily weighted toward science, engineering and math (Nte & Stephens, 2008; Wijers, Jonker & kerstens, 2008), health (Orvis et al., 2008; Aylon et al. 2005), social issues (Hamalainen et al. 2008) or business (Lindh Hrastinski, Bruhn & Mozgira, 2008). We also know that not all students learn using the same strategies because of individual differences (Reed, 1995; Skehan 1991) and personality types (Apple 2001). Of the very few experimental studies on the effects of TEL materials and English language learning, none involve personality traits, ESL students and learning gains.

From the current literature it is difficult to deduce that TEL materials have a positive effect on learning and education (Erhel, S., Jamet E, 2013). The results of research comparing technology-enhanced learning with more traditional media are still somewhat contradictory. Part of the disagreement among researchers is that often experiments using TEL materials to measure engagement and learning outcomes conflate variables through poor experimental designs and lack of sophisticated statistical analysis (Clark, 2001; Hays, 2005; Johnson, 2010). In addition, many authors use a media approach that compare TEL materials against more traditional ones. However, that design is most susceptible to confounding factors. This study uses a value added approach (Adams et.al., 2012), comparing variables from within the same TEL content or similar TEL designs, and thereby avoid the possibility of conflating variables. In addition, this study investigates English language learning gains as a function of personality and TEL engagement factors.

## 2 . 研究の目的

Research has consistently shown an existing relationship between personality traits and preferred learning styles. However, one area that has received little attention, is the connection between personality traits and learning preferences through different modalities, specifically mobile apps. As the landscape of education is transforming with the introduction of mobile digital technologies, we set out to ascertain the degree to which personality traits, English proficiency levels, and app usage patterns correlate with preferences to learn English using mobile apps. Following the validation of a new instrument measuring Perceived Value of Educational English Apps, a follow up survey comprising 70 items was administered to 3000 Japanese university students. The aim was to determine the degree of correlation between perceived app value and 1) OCEAN five dimensions of personality, 2) six facets of conscientiousness, 3) five English proficiency levels, 4) educational app usage patterns, and 5) regulation autonomy index (RAI). Multiple linear regression results showed significant positive correlations between app value and English proficiency, RAI, and app usage patterns. Furthermore, significant positive correlations also were found when personality traits were grouped using cluster analysis. A 3-way independent ANCOVA revealed significant interactions between educational app usage patterns, five clusters of the facets of conscientiousness and English ability. Two points stand out, 1) there are facet clusters that rate app value significantly higher than other clusters across all English proficiency levels, and 2) subjects with high usage patterns rate app value statistically higher irrespective of English proficiency level.

## 3 . 研究の方法

Following the validation of an instrument measuring Perceived Value of Educational English Apps, a survey comprising 70 items separated into 5 sections was used to investigate whether there are any correlations between perceived app value and several predictor variables. These variables included, i) OCEAN 5 dimensions of personality, ii) 6 facets of conscientiousness (C1~C6), iii) 5 English proficiency levels, iv) educational app usage patterns, and v) regulation autonomy index (RAI). The survey was completed over a period of 2 months using 16 different instructors at 5 different universities within the Tokyo Kanagawa areas. Respondents from 52 classes and 36 departments comprised 5 different English abilities that ranged from novice to advanced.

## 4 . 研究成果

There were significant correlations at  $p > .000$  between English App Value and (a) English competence, (b) autonomous regulation, (c) controlled regulation and (d) RAI, but not for Casual Gamer. Multiple Linear Regression showed similar results accounting for 11.5% of the variance in the data. There were no significant correlations between English App Value and (a) any of the TIPI five dimensions of personality. Regression also confirmed these results.

There were significant correlations at  $p > .01$  between English App Value and C4: achievement striving, C5: self-discipline, C3: dutifulness, C2: order, C1: competence with a R-squared of approximately 2%.

The correlation and Multiple Linear Regression results indicate that the correlation between App Value and any one of the predictor variables alone is very small or not existent. There are no correlations between App Value and dimensions of personality and the largest R-squared significant predictor from the six facets of conscientiousness, C4 and C5, and app value only accounts for 1% of the total variance.

A series of one-way ANOVAs was conducted to evaluate the relationship between English ability and (1) English App Value perceptions, (2) Casual Game Play-time, English Competence, (3) Casual game-play time, (4) English competence, (5) Autonomous-regulation. The independent variable, English ability, included 5 levels: novice, low-elementary, high-elementary, intermediate and advanced. The dependent variables are described above. There was no significant difference within the levels of English ability for (2) comparison app value  $F(4,1110)=1.95$ ,  $p=.100$ .

The test for homogeneity of variances for (3) casual game-play time and (6) controlled-regulation was significant so Welch's robust test of means was used, and there was a significant effect for both casual game-play time  $F(4,202)=10.49$ ,  $p=.000$ ; and  $F(4,187.69)=2.51$ ,  $p=.043$ .

For the remaining variables, (1) App value, (4) English competence, 5) autonomous regulation, the ANOVAs were significant:  $F(4,1110)=3.31$ ,  $p=.010$ ;  $F(4,1110)=72.04$ ,  $p=.000$ ;  $F(4,1110)=26.33$ ,  $p=.000$ . Pair-wise and Dunnett contrasts with novice set as control. Equal variances are not assumed for any contrast.

### Summary of Results

1. Gender does not play a role in perceptions of App Value.
2. English ability alone does not play a role in App Value when taken together with experience with EEApps.
3. There are three levels of experience, the most experience was whether they had paid for an educational app and used it, the lowest level was whether they had no experience with an educational app, which includes never paying for one, and the mid level was whether they used an EEApp but not paid for it. In this day of free apps, in fact this category was the highest with over 50% of the subjects.
4. There is potential bias in the design since those subjects who had purchased an EEApp had done so because they intrinsically valued it to begin with; however, this bias was eliminated by including casual gaming time with any app as a covariate.
5. The interaction between ability and experience is the most interesting. All simple contrasts within English ability is significant with medium to large effect sizes. The only non-significant contrast was for advanced ability between no experience and medium experience and that was due to low sampling at that ability level. These contrasts combined with the no significant change in app value across ability for

paid experience is highly suggestive that the subject's perception of value changes drastically when they have had the experience of using an EEApp and is independent of ability level. Said in another way, a subject is more likely to rate the value of an educational English app much lower if they have not had the experience of using one but will raise the value after having used one irrespective of English ability.

6. Furthermore, advanced students will rate the value of an EEApps the lowest with in the no-experience condition and highest of all combinations of experience and ability after using one!

## 5. 主な発表論文等

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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
研究 分担 者	ボビー ヒロユキ	九州産業大学・語学教育研究センター・准教授	
	(Bovee Nicholas)		
	(20536247)	(37102)	

