

Validating a Research Instrument for Evaluating Computer Assisted Language Learning Tasks

by

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Abstract

The aim of this project was to develop an evaluation tool for identifying which computer assisted language learning (CALL) tasks best enhance student motivation in the context of the Sojo International Learning Center, a dedicated language teaching facility at Sojo University in Kyushu, Japan. A version of the 'Intrinsic Motivation Inventory', an instrument developed by the University of Rochester's Motivation Research Group, was trialled with a variety of different tasks. The data collected was analysed in order to validate and refine the survey instrument. After rejecting a number of items, the questionnaire was found to be reliable and appropriate for use in SILC contexts. It has now been made available to other lecturers in order to assist them in evaluating CALL activities in their own classroom settings.

Key Words: CALL, Motivation, SILC, Questionnaire

1. Introduction

One of the key determiners of success in second language learning is believed to be learner motivation. As Pit Corder asserted over 40 years ago "given motivation, it is inevitable that a human being will learn a second language if he is exposed to the language data" (Corder, 1967: 164). Thus motivation has long been a concern of teachers, educational psychologists, second language acquisition theorists and, of course, learners themselves. Self-determination theory is a theory of motivation concerned with nurturing intrinsic tendencies to behave in healthy and effective ways (Deci & Ryan, 1985). When applied to educational contexts it is concerned with "promoting in students an interest in learning, a valuing of

education, and a confidence in their own capacities and attributes" (Deci et al., 1991 p.325). A number of studies have found that classroom approaches which seek to promote learner autonomy and nurture intrinsic motivation can be highly beneficial in terms of both learning outcomes and psychological well-being. For example, in field experiments in the US with high school and college students Vansteenkiste et al. found that "teachers use of intrinsic goals for framing learning activities and their providing autonomy-supportive learning climates have significant effects for students becoming more fully dedicated and more genuinely engaged in learning activities" (2004 p.259). The extent to which the findings of motivation theories are cross-culturally generalizable has been the subject of much recent debate (see for example, McInerney & Van Etten, 2004). However, Jang et al. (2009) found that even in Korea's highly

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collectivistically-orientated high school system, students benefited from classroom experiences of autonomy support. Moreover, in Japan there has recently been a strong push by the Ministry of Education, Culture, Sports, Science and Technology to promote a higher degree of learner independence in order to stimulate creativity and encourage lifelong learning (MEXT, 2009).

The Sojo International Learning Center (SILC) is a facility established in 2010 at Sojo University in Kyushu, Japan to support the development of Sojo students' foreign language skills. The SILC is responsible for delivering the taught English curriculum to first and second year students from all university faculties and also houses a self-access learning center which is open to all undergraduate students, as well as graduate students and faculty members. One of the key goals of the SILC is to support students in becoming more autonomous in their approach to language learning so that they can continue to acquire language even after their formal language requirement has been met. Many SILC lecturers make extensive use of computer-assisted language learning (CALL) both to support their taught courses and to extend learning beyond the curriculum. A variety of different resources and approaches to CALL are employed such as the use of flashcards for vocabulary learning, 'moodlereader' to support extensive reading, online forums, wikis and blogs, dedicated websites and course materials such as videos uploaded onto moodle courses.

Typically, these activities are introduced by the teacher as either class or homework tasks with the hope that more motivated students would continue to make use of the ones they found useful for their own independent study. However, given the limited class time available, it is important to understand which activities motivate students the most as these are more likely to be used over a prolonged period of time. The purpose of this study was to develop a

tool which could perform such an evaluation, allowing teachers to make informed decisions about which of their preferred CALL activities to focus on. Such a tool would need to focus primarily on intrinsic motivation, rather than purely on language learning efficacy, and need to be versatile enough to cope with a variety of different learning tasks.

For this reason, the 'intrinsic motivation inventory' (IMI), a questionnaire developed by the University of Rochester's Motivation Research Group, was chosen as the starting point. The IMI utilizes a seven-point likert scale aligned with 45 items corresponding to seven subscales designed to assess participants' interest/enjoyment, perceived competence, effort, value/usefulness, felt pressure and tension, perceived choice and relatedness while performing an activity. The questionnaire has been widely trialled in a wide variety of different contexts including educational settings and found to be highly reliable. Given the focus on intrinsic motivation, the interest/enjoyment subscale may be afforded particular significance. However, in language education contexts it is also clear that value/usefulness is likely to be important as learners are unlikely to sustain a practice if they do not feel it is of benefit to their language learning. Also, effort is likely to indicate that learners are invested in the activity while perceived competence could be assumed to correlate with motivation. The subscale of pressure and tension was felt to be rather more problematic insofar as very low levels of tension might indicate low effort or lack of challenge whereas high levels of tension may mean that learners simply avoid doing the activity. For the purpose of this research we decided to retain this subscale with the assumption that responses close to neutral were probably desirable while extreme responses may be indicative of a problem. Finally, the subscales of relatedness and perceived choice were not deemed relevant to the activities under analysis and were therefore not included.

2. Methodology

2.1 Participants

166 University students participated in the project. Their ages ranged between 18 and 22 years of age. The participants gave written consent for their answers to be used for the project. All of the participants in the study have three hours a week of English but none are English majors.

2.2 Procedure

A total of 21 items were selected from the 'Intrinsic Motivation Inventory'. Certain items were removed due to either redundancy or because they were not perceived to be appropriate in the context of the SILC.

Once the relevant items were selected they were translated from English into Japanese. The items were then back-translated into English and matched with the original version. The differences between the original version and the back-translated version were checked with translators to identify inaccuracies of translation and ambiguity within the translated Japanese version. The final 21 items are given in appendix 1 in both English and Japanese categorised according to the five chosen subscales. Once the accuracy of the translated version had been established the survey questions were randomised and an online version was created using the online survey tool 'Survey Monkey'. Participants were asked to respond to the items using a seven-point likert scale from 'strongly agree' to 'strongly disagree'.

The students were assigned an online CALL activity and afterwards directed to a link via Moodle to the online survey version of the adapted IMI. This was done on five occasions with five separate groups of students with 3 different online tasks. The data was then collated and analysed for consistency within the constructs of the survey. Inconsistent items were then removed from the

survey and a final version was created.

3. Results

3.1 Mean and Standard Deviation

The following table (table 1) represents the mean scores for the 21 items that were selected from the IMI. The mean scores range between a high of 5.60 and a low of 3.65.

Table 1: Means

Q.1	Q.2	Q.3	Q.4	Q.5	Q.6	Q.7	Q.8	Q.9	Q.10	
5.44	5.41	5.04	5.18	5.26	4.19	4.02	4.93	4.17	5.50	
Q.11	Q.12	Q.13	Q.14	Q.15	Q.16	Q.17	Q.18	Q.19	Q.20	Q.21
4.04	5.60	5.33	4.82	3.84	3.65	4.73	5.33	4.96	5.44	5.36

The table below (table 2) represents the standard deviation scores for the selected items from the IMI. The standard deviations range between a high of 1.47 and a low of 0.9.

Table 2: Standard Deviations

Q.1	Q.2	Q.3	Q.4	Q.5	Q.6	Q.7	Q.8	Q.9	Q.10	
Q.11	Q.12	Q.13	Q.14	Q.15	Q.16	Q.17	Q.18	Q.19	Q.20	Q.21
1.26	0.98	1.12	1.62	1.47	1.47	1.26	1.23	1.19	1.20	1.12

3.2 Factor Analysis

Tables 3 to 7 show the correlations between survey items within each construct.

The following table (table 3) shows the relationship between the inventory items measuring interest and enjoyment. The strongest relation is between item 1 and 5 (0.78), and the weakest is between 2 and 3 (0.31).

Table 3: Interest and Enjoyment

Qu. 1 & 5	Qu. 2 & 3	Qu. 2 & 4	Qu. 2 & 5	Qu. 3 & 4	Qu. 3 & 5	Qu. 4 & 5
0.78	0.58	0.31	0.75	0.58	0.55	0.39

Table 4 show the correlations for the construct 'perceived competence'. The strongest relation is between items 7 and 8 at 0.64, and the weakest is

between items 8 and 9, falling below 0.3 at 0.28.

Table 4: Perceived Competence

Qu. 7 & 8	Qu. 7 & 8	Qu. 8 & 9	Qu. 6 & 8	Qu. 6 & 9	Qu. 7 & 9
0.64	0.45	0.28	0.44	0.38	0.31

In the following table the correlation for Effort and Importance are shown. The weakest correlation is between items 11 and 12 (0.056), and the strongest is between 10 and 13 (0.60). All of the relations with item 11 are below 0.14 and therefore show little relation within this construct.

Table 5: Effort and Importance

Qu. 10 & 11	Qu. 11 & 12	Qu. 12 & 13	Qu. 10 & 12	Qu. 10 & 13	Qu. 11 & 13
0.056	0.002	0.43	0.50	0.60	0.13

The following shows correlation items representing 'Pressure and Tension'. The highest correlation is between 16 and 14 and the lowest between 15 and 14.

Table 6: Pressure and Tension

Qu. 16 & 14	Qu. 15 & 14	Qu. 15 & 16
0.50	0.21	0.38

Table 7 show correlations for the construct 'Value and Usefulness'. This construct seems particularly robust as all of the correlations are above 0.52. The strongest relation is between items 17 and 19, as well as 17 and 20, both at 0.66.

Table 7: Value and Usefulness

Qu. 17 & 18	Qu. 17 & 19	Qu. 17 & 20	Qu. 17 & 21	Qu. 18 & 19	Qu. 18 & 20	Qu. 18 & 21	Qu. 19 & 20	Qu. 19 & 21	Qu. 20 & 21
0.63	0.66	0.66	0.53	0.61	0.71	0.64	0.57	0.58	0.61

4. Discussion

The majority of the items show a relation with one or all of the other items within the same construct. However, there were notable exceptions. Item 11 'I didn't try very hard to do well at this activity' did not correlate with the other items from the 'effort and importance' subscale. It is possible that participants found the item confusing because of its complex grammatical construction. Certainly, the combination of the negative 'didn't try' and modifier 'very hard' could lead to a high degree of ambiguity. Since the other items from within the 'effort and importance' subscale seemed to provide good coverage of the construct the problematic item was removed.

In the case of 'perceived competence', item 9 'This was an activity that I couldn't do very well' did not correlate as well as the other items, again possibly as a result of the negative construction and was therefore removed. Similarly, In the 'interest and enjoyment' subscale, it was felt that there was an unnecessary degree of redundancy so the item with the weakest correlation, item 4 'This activity did not hold my attention at all' was removed.

Finally, in the case of 'pressure and tension' a number of problems were noted. Firstly, although the means for these three items were close to neutral, there was significant variation in responses. In fact, the standard deviations for each of these three items were the highest in the whole survey. This may indicate problems with the items themselves or merely reflect the diverse ways in which students responded to the construct. It could certainly be argued that this construct tends to focus more on the participant than the activity being undertaken. In any case, it seems unlikely that this subscale, at least in its current form, would be able to furnish useful data with which to evaluate learning tasks and consequently all three items relating to this construct have been removed

from the survey. This was not altogether surprising given the concerns noted in the introduction above.

The revised survey consists of 15 items representing the remaining four subscales and is given in appendix 2. The survey has now been made available to all SILC instructors via a shared survey monkey account. Instructors are encouraged to use the survey to analyse responses to specific CALL tasks within their own classrooms. This data will also be collated centrally to inform future research into the relationship between CALL and learner motivation in the SILC.

It is important to note certain limitations to this research. In particular, although the questionnaire has been designed for use with a variety of different tasks-types, it may not be appropriate for activities which differ significantly in nature from the ones used during trialling. Therefore teachers and researchers need to exercise caution in deciding whether or how to use the survey within their own classroom contexts.

References

- Brown, J. D. (2001). *Using surveys in language programs*. Cambridge: Cambridge University Press.
- Corder, S.P. (1967). The significance of learners' errors. *International Review of Applied Linguistics* 5 (2/3), 161-169.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behaviour*. New York: Plenum
- Deci, L., Pelletier, R., Ryan, M., Vallerand, R. (1991). Motivation and Education: The Self-Determination Perspective. *Educational Psychologist* 26(3 & 4), 325-346.
- Jang, H., Reeve, J., Ryan, R. M., Kim, A. (2009). Can self-determination theory explain what underlies the productive, satisfying learning experiences of collectivistically oriented Korean students?. *Journal of Educational Psychology*, 101, 644-661.
- McInerney, D. M., & Van Etten, S. (2004). Big theories revisited: Research on sociocultural influences on motivation and learning (Vol. 4). Greenwich, CT: Information Age
- Ministry of Education, Culture, Sports, Science and Technology (MEXT). (2009). National Policies Concerning Lifelong Learning. Retrieved on 22nd February 2012 from <mext.go.jp/english/lifelonglearning>
- Vansteenkiste, M., Simons, J., Lens, W., Sheldon, K. M., Deci, E. L. (2004). Motivating learning, performance, and persistence: The synergistic role of intrinsic goals and autonomy-support. *Journal of Personality and Social Psychology*, 87, 246-260.

Appendices

Appendix 1 :

The 21 survey items initially adapted from the 'Intrinsic Motivation Inventory'

Interest/Enjoyment

1. このアクティビティをととても楽しんだ。
I enjoyed this activity very much.
2. このアクティビティをするのはとても楽しかった。 This activity was fun to do.
3. このアクティビティはつまらないと思った。
I thought this was a boring activity.
4. このアクティビティには全く集中できなかった。 This activity did not hold my attention at all.
5. このアクティビティはとても興味深いと思う。
I would describe this activity as very interesting.

Perceived Competence

6. このアクティビティは得意だと思う。
I think I am pretty good at this activity.
7. 他の生徒に比べて、自分はこのアクティビティはうまくできたと思う。 I think I did better this activity than other students.
8. この課題に対する自分の結果に満足している。
I am satisfied with my performance of this task.
9. このアクティビティはうまくできなかった。
This was an activity that I couldn't do very well.

Effort/Importance

10. このタスクには一生懸命取り組んだ。
I put a lot of effort into this.
11. あまり努力せずにこのタスクすることができた。I didn't try very hard to do well at this activity.
12. このアクティビティにはかなり努力した。
I tried very hard on this activity.
13. この課題をうまくやり遂げることは自分にとって大切だった。It was important for me to do this task well.

Pressure/tension

14. このアクティビティをしている間は全く緊張しなかった。I did not feel nervous at all while doing this activity. (R)
15. このアクティビティをしている間はとても緊張した。I felt very tense while doing this activity.
16. この課題をしている間は不安だった。
I was anxious while working on this task.

Value/Usefulness

17. 自分にとって役立つアクティビティなので再びやりたいと思う。I would be willing to do this again because it has some value to me.
18. このアクティビティを行うのは英語の練習に効果的だと思う。I think doing this activity could help me to practice my English skills.
19. このアクティビティは英語を使用する自信を持たせてくれたと思う。I think this activity made me have confidence to use English.
20. このタスクは自分にとって役に立つだろうと思う。I believe doing this activity could be beneficial to me.
21. これは大切なアクティビティだと思う。
I think this is an important activity.

Appendix 2 :

The final 15-item survey (subscales indicated in brackets)

1. このアクティビティにはかなり努力した。
I tried very hard on this activity. (E)
2. この課題に対する自分の結果に満足している。
I am satisfied with my performance on this task. (C)
3. このタスクは自分にとって役に立つだろうと思う。I believe doing this activity could be beneficial

to me. (V)

4. このアクティビティは得意だと思う。
I think I am pretty good at this activity. (C)
5. このアクティビティはつまらないと思った。
I thought this was a boring activity. (I)
6. このアクティビティを行うのは英語の練習に効果的だと思う。I think doing this activity could help me to practice my English skills. (V)
7. このアクティビティをするのはとても楽しかった。This activity was fun to do. (I)
8. これは大切なアクティビティだと思う。
I think this is an important activity. (V)
9. この課題をうまくやり遂げることは自分にとって大切だった。It was important for me to do this task well. (E)
10. このアクティビティはとても興味深いと思う。
I would describe this activity as very interesting. (I)
11. このアクティビティは英語を使用する自信を持たせてくれたと思う。I think this activity made me have confidence to use English. (V)
12. 他の生徒に比べて、自分はこのアクティビティはうまくできたと思う。I think I did better this activity than other students. (C)
13. 自分にとって役立つアクティビティなので再びやりたいと思う。I would be willing to do this again because it has some value to me. (V)
14. このタスクには一生懸命取り組んだ。
I put a lot of effort into this. (E)
15. このアクティビティをとても楽しんだ。
I enjoyed this activity very much. (I)

Constructs :

I = Interest & Enjoyment
C = Perceived competence
E = Effort & Importance
V = Value & Usefulness

(P = Pressure & Tension - removed)