

Involvement in Subject Learning Scale (ISLS)

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Abstract

Since 1984, when the American Department of Education published a report on higher education entitled "Involvement in learning, realizing the potential of American higher education," many studies have been conducted on this subject pertaining mainly to academic involvement and, a wide-range concept of involvement in learning. It is proposed here to limit the scope of this concept to involvement in subject learning as an easier bounded concept. The Involvement in Subject Learning Scale (ISLS) was therefore constructed and validated and is presented here with its psychometric characteristics. This scale is proposed as an educational outcome measure for research purposes on the quality of instruction in higher education.

Résumé

Depuis 1984, alors que le département d'éducation américain publiait son rapport sur l'enseignement supérieur intitulé: "Involvement in learning, realizing the potential of American higher education," plusieurs études ont été réalisées sur ce sujet relié à l'engagement académique et surtout sur le vaste concept d'engagement dans les études. Les auteurs proposent ici de limiter la portée de ce concept à l'engagement par rapport à la matière, une réalité plus facile à circonscrire. Ils ont alors

procédé à la construction de l'instrument de mesure de l'engagement par rapport à la matière et à sa validation. Ils présentent ici cet instrument avec ses propriétés psychométriques et le proposent comme mesure des extrants à des fins de recherche sur la qualité de la formation universitaire.

Introduction

Increasing attention has been focused on teaching and learning in higher education. In 1984, a study group sponsored by the National Institute of Education of the American Department of Education published a report entitled "Involvement in Learning: Realizing the Potential of American Higher Education". The authors of this report proposed three conditions of excellence for higher education: student involvement, high expectations and assessment and feedback. For this group, "the first of these three conditions – and perhaps the most important for purposes of improving undergraduate education – is student involvement" (NIE, 1984, p. 17).

Student involvement in learning is a particularly wide-ranged concept and therefore cannot be easily measured. A scale was built in order to measure student involvement in subject learning thus reducing the scope of this concept. The scale was constructed for use at the higher education level in a Ph.D. dissertation and consisted of a self-rating scale for French-speaking students in Québec higher education. The Involvement in the Subject Learning Scale (ISLS) is proposed in an English version for validation and further research.

The concept to be measured by the scale will first be defined followed by a brief review of the literature. A description of the French version construction and validation procedure will then be given. Finally, the validity and reliability of the ISLS will be documented and discussed.

The problem

The problem of involvement in learning, which is seen as a priority in American higher education, is often met with expressed concerns in university faculties. The problem of involvement is also often mentioned by employers hiring higher education graduates.

Fraser *et al.* (1987) have conducted a synthesis of educational productivity research in which they found that no attention was being given to student involvement in learning as an educational outcome. Most research used academic achievement as a dependent variable. The lack of valid and reliable measurement tools for other research variables such as student involvement in learning may be a reason explaining the use of this single academic achievement variable. Robert Pace (1985) has largely contributed to the development of instruments to measure variables other than academic achievement. His College Student Experiences Questionnaire, focusing on what is called quality of effort, contains many factors in which one is related to student involvement. However, in this questionnaire involvement seems to be considered more as a process than a product variable. If student involvement in learning is to be used as a criterion for a decision-making procedure in research on educational effectiveness, measurement tools considering involvement in learning as an educational product must be developed and validated.

To further the development of knowledge on student involvement in learning considered as an educational outcome, the scope of involvement was reduced to subject learning and a scale was constructed.

The operational definition of the concept to be measured

Astin (1984) first defined student involvement as “the amount of physical and psychological energy that the student devotes to the academic experience. Thus, a highly involved student is one who, for example, devotes considerable energy to studying, spends much time on campus, participates actively in student organizations, and interacts frequently with faculty members and other students” (p. 297). Astin intended to direct attention away from subject matter and technique toward motivation and student behavior.

More recently, Astin (1993) has proposed two conceptually distinct types of student involvement measures: first, one “that can be ascertained at the point when students initially enter college,” (p. 5) and second, a much more extensive involvement, including measures of

intermediate outcomes "that can be known only after the student has been in college for some period of time" (p. 5). This latter type of involvement can be divided into "five broad categories: academic involvement, involvement with faculty, involvement with student peers, involvement in work, and other forms of involvement."

Since 1978, many researchers have adapted traditional measures of job involvement to academic settings (Batlis, 1978; Edwards & Waters, 1980; Farrell & Mudrack, 1992; Rabinowitz, 1985). These authors simply replaced the words "job" or "work" by "school" or "course work" in survey items taken from measurement scales on job involvement constructed by Lodahl and Kejner (1965), and Kanungo (1982). The researchers studied the relationship between academic job involvement and many other variables such as verbal ability, personality characteristics, academic performance, and course satisfaction. "Academic involvement has correlated positively with outcomes such as hours per week spent on school work, course attendance, final course grade, and overall grade point average." (Farrell & Mudrack, 1992, p. 5).

Willis (1993) analyzed the six forms of student involvement proposed by Astin, opting to group them into two general categories: institutional involvement (including residence, athletic involvement, and political participation) and academic involvement which is more concerned with learning. Willis (1993) considers academic involvement as "a mixture of affective experience, learning outcomes and classroom interaction" (p. 6).

Involvement in subject learning, which is the focus of this paper, considers involvement quite similar to Willis' definition (1993), but with a much narrower scope. In order to better understand the specifics of involvement in subject learning and distinguish it from motivation, we will use a metaphor. Let us compare a student to a car driver. When the motor is running, the driver is ready to leave, but the car is not moving. The driver is motivated without involvement. When the car starts to move, the driver is on the road with an intention to go somewhere. Therefore, the driver is involved in pursuing a goal. Similarly, the definition of subject learning involvement focuses on affective as well as behavioral aspects including actions and future oriented intentions. It

deals with subject learning without consideration for academic performance which is a process orientation. A student who is highly involved in subject learning works on a subject taught in a single course with the intention to use the acquired skills in his future career. The student is aiming at achieving high marks, but the student also envisions a more long-term goal such as being able to use this knowledge in lifelong activities. Therefore, the student is willing to do more than what is expected in class. For example, the student looks for and reads papers on the subject, builds a reference list, attends conferences, watches television programs, and actively participates in discussions with schoolmates.

Purpose of the scale

The Involvement in Subject Learning Scale (ISLS) is a self-rating scale constructed for research purposes on educational effectiveness. In an attempt to control social desirability and avoid cheating, students were asked that their answer sheet remain anonymous. Aside from research purposes, the utility of the scale is to help faculty evaluate the effectiveness of their teaching strategies in reaching long-term goals and objectives in the affective domain. The individual scores may not be valid or reliable if used for summative purposes such as selection or grading.

Overview of the literature

Involvement has been first investigated through organizational behavior or human resources management research (London, 1983; London & Mone, 1987; Morrow, 1983). Also, commitment and engagement are two close concepts that have been used by different authors to investigate a similar reality. Kiesler (1971) has documented the concept of commitment while Nystrand and Gamoran (1991) studied the relation of engagement with instructional discourse.

Recently, Aryee and Tan (1992) defined career commitment as "an affective concept which represents identification with a series of related jobs in a specific field of work and is behaviorally expressed in an ability to cope with disappointments in the pursuit of career goals" (p. 7). It may be noted that three different terms are used to designate a concept

that covers a wide range of behaviors. Kelley *et al.* (1987) suggest “involvement”, “engagement”, and “commitment” as possible terms to be associated with a close relationship at varying levels of intensity. Male and female interaction is an illustration of this increasing relationship. Initially, partners are involved in a relationship. Later, they make plans to get married and thus get engaged. Finally, when the relationship is ready to be established, they commit themselves by getting married. The three terms may well be used to express the same reality but at different levels of intensity.

Frequently, involvement (or engagement or commitment) is mentioned by authors to make distinctions between motivation and attitudes. “We think of motivation to learn as how the student feels about becoming engaged in instruction, whereas an attitude is how the student feels following the instruction” (Acheson & Gall, 1992, p. 32).

Past research on university learning focused mainly on academic achievement as a dependent variable (Astin, 1984; Fraser, 1987). Motivation, particularly intrinsic motivation, and involvement in learning have often been used as independent variables (Astin, 1993; Farrell and Mudrack, 1992; Fraser, 1987; Pace, 1984, 1988; Willis, 1993). Learning involvement is considered here as a dependent variable, that is, an educational outcome. To this date, no valid educational test for higher education, has been constructed to measure student involvement in subject learning as a clearly identified educational outcome.

ISLS development

Based on this definition of involvement in subject learning, 35 items were constructed for higher education students. Ten of these items describe undesirable behaviors in order to control the utilization of response sets by students. The items were then reviewed by three higher education specialists. Following recommendations by these three reviewers, a few corrections were made to some of the items.

The reviewed items were submitted to 22 teachers, all teaching at the higher education level, who were taking a course on the construction of measurement tools. Given the definition of involvement in subject

learning, these teachers were asked to indicate on a rating scale their perception of the relation between each item and that definition. This rating scale had nine steps ranging from "almost opposite" to "almost related" in relation to the definition, with a neutral choice in the center. This testing of the content validity suggested a deletion of five items which were considered either as being poorly related or where no consensus could be made at all.

The 30 remaining items were gathered in a self-rating questionnaire. Directions were given with a four-step rating scale, ranging from (3) "it is exactly what I feel or do" to (0) "it is not at all what I feel or do". A four step scale was chosen to eliminate all neutral answers. This kind of scale, originally devised by Louis Guttman in the 1940s, is clearly defined and considered by Pace (1984) as producing "a very reliable score which has also a very explicit meaning" (p. 11). Involvement in subject learning scores are produced in the ISLS by calculating the mean of the answers given by each subject. The minimum score is 0, and the maximum score is 3. Students were asked to answer all 30 items, but a reliable score may be calculated with as few as 10 answered items. Therefore, the scale could be considered as a forced-choice scale. For items 5, 7, 14, 17, 19, 23 and 30, which indicate a lack of involvement, the scale is reversed for the calculation of the scores.

This first version of the scale was administered to 150 university students in a medical school in France. Additional corrections were proposed by these subjects for whom some expressions were ambiguous. An item analysis was also performed using the RELIABILITY procedure from SPSSX. This analysis produced a reliability coefficient (Cronbach's alpha) of 0.86. The item-total corrected correlations indicated that all 30 items had a positive correlation with the total score. The reversed items all showed a notably lower item-total correlation, and were consequently rewritten in an effort to reduce ambiguity.

The second version of the scale was administered to 42 students in Quebec, producing a reliability coefficient (Cronbach's alpha) of 0.90. In order to check for discrimination, this second version of the scale was administered once more to 20 students who were asked to answer twice: first, considering their involvement in learning the subject taught by the

faculty they preferred during the last semester, and second, considering the subject taught by the faculty they liked the least. This last administration of the second version produced a reliability coefficient (Cronbach's alpha) of 0.96. The mean score for the least-liked faculty was 0.34 as compared to 2.4 for the preferred faculty. A final trial of the scale (second version) was conducted with a sample of 2858 subjects, which gave a reliability coefficient (Cronbach's alpha) of 0.94, with the lowest corrected item-total correlation at 0.37 and the highest at 0.73. The mean scores were 1.49 for the men and 1.58 for the women. Therefore, women were revealed to be significantly more involved in subject learning than men ($p < 0.001$).

Following is a list of five items whereby the highest item-total correlation offers a better indication of exactly what was measured by the scale.

- 4 If I could, I would participate at conferences on this subject.
- 9 I wish I could buy books dealing with this subject.
- 11 Even if my marks were low, I would nevertheless like to take courses on this subject.
- 22 Once this course is finished, I intend to become more competent in this subject.
- 26 If I pursue graduate studies, I would like this subject to be in my program.

Factor analysis

An exploratory factor analysis was performed according to the answers given by the 2858 subjects on the final administration of the scale. This procedure from the SPSSX (1988) produced five factors using the Kaiser criterion with the Varimax Extraction Formula. The overlapping threshold was fixed at .48. Table 2 presents all five factors with their factor loading. Factor loading over .48 is highlighted.

The first factor explains 37.5% of the total variance and was entitled "Time". The 15 items (in bold) strongly related to this factor are all concerned with the time the student is willing to spend on learning more about this subject during or after the course has finished.

Table 1
**Corrected Item-total R and Alpha Minus Item for the ISLS
 (N=2,858)**

Items	Corrected Item-total R	Alpha-I	Items	Corrected Item-total R	Alpha I
Item 1	0.5885	0.9380	Item 16	0.5485	0.9383
Item 2	0.6023	0.9379	Item 17	0.4886	0.9389
Item 3	0.6296	0.9373	Item 18	0.5419	0.9384
Item 4	0.6639	0.9371	Item 19	0.4796	0.9390
Item 5	0.3646	0.9404	Item 20	0.6023	0.9377
Item 6	0.5487	0.9384	Item 21	0.5897	0.9379
Item 7	0.5973	0.9378	Item 22	0.7301	0.9363
Item 8	0.4762	0.9390	Item 23	0.5189	0.9386
Item 9	0.6891	0.9368	Item 24	0.6347	0.9374
Item 10	0.5975	0.9378	Item 25	0.6211	0.9375
Item 11	0.6656	0.9370	Item 26	0.7340	0.9362
Item 12	0.5810	0.9380	Item 27	0.5628	0.9382
Item 13	0.6419	0.9373	Item 28	0.6181	0.9376
Item 14	0.4128	0.9399	Item 29	0.4188	0.9400
Item 15	0.5414	0.9384	Item 30	0.4199	0.9399

The second factor explains 6.3% of the total variance and was entitled "Utility", grouping six items related to the utility of this subject. It must be noted that these items all describe undesirable behaviors.

The third factor, explaining 4.4% of the total variance, was entitled "Resistance to tiredness". It regroups four items relating to tiredness, such as resistance to fatigue and inability to see time go by.

The fourth factor explains 4% of the total variance and was entitled "Exams". It regroups three items relating to the attention paid by students to exams and exam results. The behaviors described by these items were all treated as undesirable behaviors.

The fifth and final factor explains 3.6% of the total variance and was entitled "Assiduousness". It regroups two items relating to class atten-

Table 2

Factor Loading for the ISLS Items (N=2,858)

Items	Time	Utility	Resist.	Exams	Assid.
1	0.49	0.35	0.09	0.03	0.27
2	0.66	0.06	0.06	0.16	0.23
3	0.58	0.16	0.11	0.28	0.15
4	0.72	0.19	0.14	0.11	0.03
5	0.29	0.08	-0.03	0.64	-0.11
6	0.28	0.20	0.19	0.07	0.72
7	0.21	0.54	0.22	0.41	0.12
8	0.15	0.02	0.58	0.16	0.34
9	0.68	0.15	0.15	0.23	0.14
10	0.55	0.18	0.09	0.14	0.32
11	0.43	0.25	0.28	0.33	0.23
12	0.63	0.08	0.32	0.05	-0.05
13	0.62	0.27	0.13	0.12	0.14
14	0.07	0.21	0.09	0.62	0.23
15	0.54	0.01	0.18	0.15	0.24
16	0.22	0.55	0.18	0.34	0.04
17	0.15	0.82	0.05	0.06	0.11
18	0.20	0.05	0.69	0.17	0.16
19	0.16	0.80	0.03	0.03	0.13
20	0.49	0.22	0.15	-0.04	0.01
21	0.52	0.08	0.35	0.09	0.12
22	0.58	0.34	0.32	0.16	0.06
23	0.17	0.52	0.19	0.32	0.06
24	0.29	0.12	0.61	0.21	0.28
25	0.48	0.17	0.54	0.05	-0.03
26	0.56	0.31	0.47	0.07	0.02
27	0.57	0.04	0.25	0.10	0.12
28	0.50	0.28	0.47	-0.01	-0.08
29	0.18	0.12	0.14	0.05	0.75
30	0.11	0.11	0.21	0.68	0.05
NI	15	5	4	3	2

The fifth and final factor explains 3.6% of the total variance and was entitled "Assiduousness". It regroups two items relating to class attendance: willingness to be on time, and anxiety not to miss a class period.

Parsimony is an important criterion in scale validation. It could be argued that the 15 items relating to the first factor could be sufficient to measure involvement in subject learning. We believe that all these factors are useful in measuring involvement in subject learning the way we have defined it. Otherwise, focus would be placed only on actual behaviors neglecting feelings and intentions which are, in our point of view, important aspects of involvement considered as an educational outcome.

Utility of the scale

This scale was constructed for use in a PhD dissertation. The main objective of this dissertation was to explore the relation between teaching styles, faculty-student relationships, and involvement in subject learning. A positive and significant relationship was found between these three variables. This research is reported in another publication (Bujold & Saint-Pierre, 1996). In addition to academic achievement, results suggest that involvement in subject learning could be considered a valuable outcome for teaching and learning. Academic achievement could then be considered as a short-term goal while involvement in subject learning a long-term goal. Fraser *et al.* (1987) examined "thirty-three post-1949 studies of the college and professional-school grades of physicians, engineers, civil servants, teachers, and other groups have found an average correlation of 0.16 between these educational outcomes and life-success indicators such as income, self-rated happiness, work performance, and output indexes, and self-, peer-, and supervisor-ratings of occupational effectiveness" (p. 162). Perhaps more life-success indicators could be predicted by adding the results of this scale measuring an educational outcome to grades. It could also be used to test the teaching effectiveness of devices designed to encourage students to focus on the future, which may help them avoid school dropout. Finally, graduate students who intend to work on involvement in learning at the higher education level may be interested in adding this scale to their

research plan. Researchers are invited to use this new English-language version of the instrument.

Limitations

This scale is a self-rating scale. Mabe and West (1982), and Harris and Schaubroeck (1982), have pointed out that such ratings are less valid than ratings by others for performance measures. But involvement in subject learning is not a performance measure, it is rather related to feelings and intentions, and consequently, it cannot be externally observed. Self rating is therefore the only possible way of measuring it. Among four favorable critical measurement conditions suggested by Mabe and West (1982) to control the effects of social desirability, anonymity is the only one that can be used in the present case. When applied to 3,250 university students, the mean score was 1.54 while the scale range varies from 0 to 3. If grade inflation is the main bias in self ratings results, it seems evident that it is not important in the ISLS. However, it is impossible to use the individual scores for summative evaluation purposes. These scores could be very useful in improving teaching or reexamining educational organization at the college or university level.

Conclusion

Until now, academic achievement has been considered the most important, if not the only, dependent variable in most research in higher education. Nevertheless, academic achievement is not the only, or the best predictor of professional success. Therefore, it is important to measure other potential variables. Among these other variables, involvement in learning could be considered significant. Inspired by the study group's report of the National Institute of Education of the American Department of Education (1984), a scale was constructed and validated to measure involvement in subject learning. This scale was constructed according to Alexander Astin's theory (1984).

The Involvement in Subject Learning Scale (ISLS) was pretested at the higher education level in both France and the province of Quebec, Canada. Content validity was tested by three competent judges, as well

as by 22 other judges. Item analysis revealed a high reliability. An exploratory factor analysis was also performed and five factors were extracted, giving more precision to the content validity of the scale. This scale is suggested for use as a dependent variable to measure the outcomes of higher education courses or programs and it is proposed to researchers who would be interested in using it in an English version. ✱

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Appendix: Student involvement in subject learning scale (SISLS)

The next thirty statements may represent your feelings and perceptions about what is taught in the present particular course. Indicate to what degree each of these statements correspond to your feelings and perceptions by choosing an answer from those that are listed in the forward legend and write the letter identifying it before each statement. Make sure that you put the correct letter with the corresponding item number.

- A. It is exactly what I feel or do.
- B. It is rather what I feel or do.
- C. It is more or less what I feel or do.
- D. It is not at all what I feel or do.

- 1 I have put a great deal of energy into studying this subject because I know I will have to use it in my future career.
- 2 I try to read all articles written on this subject.
- 3 I like to participate when this subject is discussed.
- 4 If I could, I would attend conferences on this subject.
- 5 It is mostly because I hope to get good marks that I study this subject.
- 6 I hate missing a course when this subject is taught.
- 7 If I were not obliged to study this subject, I would drop it.
- 8 I easily resist fatigue when I work on this subject.
- 9 I wish I could buy books dealing with this subject.
- 10 I carefully keep all documents covering this subject.
- 11 Even if my marks were low, I would nevertheless like to take the courses on this subject.
- 12 I would accept becoming a member of a research association on this subject.
- 13 If I learn that a television program would be on this subject, I would make an effort to watch it.
- 14 If I could get a copy of the next exam, I would be ready to pay to get it and not have to study this subject.
- 15 I wish to meet the teaching outside of the course to discuss the subject.
- 16 If I pass this course, I will not look back at this subject anytime soon.

- 17 It seems to me that this curriculum would be just as good without this subject.
- 18 When I work on this subject, it takes longer for me to get tired than with other subjects.
- 19 My training would be just as good without studying this subject.
- 20 My career choice was surely influenced by the fact that I liked this subject.
- 21 I feel naturally attracted by a specialist in this subject.
- 22 Once this course is finished, I intend to become more competent in this subject.
- 23 It is difficult for me to understand people who like this subject.
- 24 When I work on this subject, I don't feel that time goes by.
- 25 If I have to teach someday, I would like to teach this subject.
- 26 If I should pursue graduate studies, I would like this subject to be in my program.
- 27 Everyday I collect documentation on this subject.
- 28 I wish I could work in this domain during the vacation.
- 29 I hate being late to a class on this subject.
- 30 I would like the teacher to tell us what to study for the next exam, so that I could save time and not have to study everything.