

A Study on Internet Usages, Academic Achievements, and the Exploring Capability of Regional Culture Knowledge Using Internet– A Case of Primary School Students in Taiwan

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Abstract: - In this paper, we present a case study to discuss the internet usages of primary school students and the exploring capabilities of using internet on regional culture course. 226 students of grade five from a primary school in Taiwan were selected as samples. We designed a questionnaire to analyze the internet usages and behaviors of these sampled students including time spending in internet, frequency, location, and reason of using internet, internet activity, and recognition of internet functionality. We designed questions for the regional culture test and conducted experiments to analyze the relationships between the internet usages and the scores of the regional culture test. Furthermore, we analyzed the relationships among students' backgrounds, academic achievements, internet usages, and the scores of the regional test. Concluding remarks and the suggestions for future studies are also provided at the end of this paper.

Key-words :- Regional culture, Exploring capability, Internet usages, Academic achievement.

1. Introduction

Recently, with the reformation of the curriculum in Taiwan, the regional culture course formally becomes one of regular courses in primary schools. Elementary teachers therefore need to pay more teaching hours in such course. However the teaching materials in the regional culture course in primary schools vary depending on the area where the schools are located. No textbooks can cover the learning materials of the regional culture for all of the primary schools in difference areas in Taiwan. In practice, most of regional culture teachers need to design, write, and edit their teaching materials for the course to fit the special needs. It is a big challenge for the primary teachers who teach regional culture course. One of solutions to solve the problem is using internet. Due to the promotion of network bandwidths and web technologies, more and more daily life and behaviors rely on internet such as shopping, retrieving information, banking, and learning. The internet provides unlimited environments in time and geography. People can access internet anywhere and anytime whenever they need. Hence, many teaching activities in regional culture courses are conducted via internet.

Four main integrated learning fields are taught in the primary schools in Taiwan including the learning fields of language, mathematics, natural science and living technology, and social studies.

One of the important goals of these leaning fields is to let students have widely-scoped knowledge and the skills of integrating their knowledge from different disciplines.

This paper primarily aims at investigating the relationships among internet usage, students' backgrounds, academic achievements, and the exploring capability of regional culture. 226 students of grade 5 form 7 classes in a primary school were selected as examples for this study. This school is located in Wandan, Pingtung located in the south of Taiwan. It is a middle-size township with about 54,000 residents. We designed questions for the regional culture test and conducted experiments to analyze the relationships between the internet usages and the scores of the regional culture test. Furthermore, we analyzed the relationships among students' backgrounds, academic achievements, internet usages, and the scores of the regional test.

2. Related works

Several studies on the internet usages and behaviors of primary school students in Taiwan have been done in previous researches [1-5]. Some of them indicated that for elementary school students the time-spending in internet is 2.5 hours a week, the frequency is twice to three times a week, and the average time per internet access is 20 to 30 minutes [1,5]. Meanwhile, the popular locations for internet access are, in a descending order, home, school, and

internet cafe. Male students spend more times in playing on-line games than Female students [1]. The usages of searching engine and email for the students in small-size schools (schools having 12 or less classes) are heavier than those of the students in large-size schools (schools having more than 12 classes) [1]. In addition, the usages of some internet activities for the students in special classes (classes whose students possess some special gifted talents, i.e., musical classes, and fine arts classes) are heavier than those in regular classes [1]. However, the usage of on-line games for the students in regular classes is heavier than those in special classes [1].

Recently regionalization issues have become one of important directions for government policies in Taiwan. Many county governments have established different committees to promote regionalization education [6]. To fit the trend of localization, the education authority has officially added the regional culture course as a regular course in primary schools [7-8]. One of the goals of the regional culture course is to help students establish correct value with empathy to respect different areas, races, and religions for the multi-culture society in Taiwan [9]. A previous study also pointed out that the promotion of multi-culture should be conducted together with the education of regional culture to achieve a peaceful and well-developed society [9]. The purpose of the regional education is to help people get familiar with environment, establish culture identity, and prepare to be a member of the global society [10]. This paper covers the issues of e-learning on the regional culture course. In addition to the course involved in this study, the e-learning has been utilized in many courses with successful applications [11-13]

3. Research design

3.1 Structure

Figure 1 shows the research structure of this paper. There are three parts in this figure: academic achievements, students' backgrounds, scores of regional test, and internet usages. The academic achievements were obtained from the previous academic reports of the 226 participants (students), scored in a five-level basis (A, B, C, D, and E). The students' backgrounds were acquired from the students' personal records. The score of regional test were received by a test, also scored by a five-level basis. The internet usages were obtained through a survey with six questions, as indicated below:

Q1. Time spending in using internet with values of (1) less than one hour a day; (2) between one

and two hours a day; (3) between 2 and 3 hours a day; (4) between 3 and 4 hours a day; (5) other.

- Q2. Frequency of using internet with values of (1) once a week; (2) twice to three times a week; (3) four times to six times a week; (4) everyday; (5) others.
- Q3. Location of using internet with values of (1) home; (2) computer classroom; (3) internet cafe; (4) Friend's house; (5) others.
- Q4. Reason of using internet with values of (1) doing homework; (2) obtaining information; (3) killing time; (4) accessing email; (5) others.
- Q5. Internet activity with values of (1) searching information; (3) downloading software; (4) reading news; (5) playing game; (6) chatting; (7) browsing websites; (8) using email; (9) others.
- Q6. Recognition of internet functionality with values of (1) email; (2) online game; (3) information searching; (4) web messenger (i.e., MSN or Yahoo Messenger); (5) information retrieval; (6) knowledge acquirement; (7) information providing to other people; (8) others.

Of the above six questions, Q1 to Q3 are answered by selecting one single value only. Q4 to Q6 are answered by selecting multiple values whenever appropriate.

The scores of the regional culture were from a test with 50 questions. The original scores were transferred into five levels according to the distribution of the scores. We will explain the experimental details later in this paper.

3.2 Procedure

Step 1: Design questionnaire.

The questionnaire was designed after interviewing three domain experts (senior computer teachers). This questionnaire was designed to realize the behaviors and usages of internet of primary school students. Six questions were included in this questionnaire as mentioned in Section 3.1.

Step 2: Design questions for regional culture test.

The test was designed based on the www resource about the regional culture of Wandan Township (the area where the selected primary school for this study is located). There were totally 50 questions in the regional culture test. 25 of them were related to Wandan Township, and 25 related to Pingtung County where Wandan Township belongs to. Six senior teachers who have resided in the township or in its neighboring areas for more than ten years were selected to write the questions for the test. The

questions were then reviewed by the senior citizens who were familiar with the regional culture and legendary tales of the township and the county.

Step 3 Conduct experiment

During experiment, the questionnaires were first answered by the students. After completing the questionnaires, the students were then tested with 50 regional culture questions. Internet access was provided for the students during the test. Students were encouraged to use www resource when answering the questions. The time period for the test was 40 minutes.

4. Statistical Analyses

4.1 Descriptive statistics and regional culture test results

Table 1 shows the descriptive statistics about the internet usages in time spending, frequency, and location. Table 2 demonstrates the descriptive statistics about the reason of using internet, internet activities, and recognition of internet functionalities. Table 3 displays the descriptive statistics of the students' backgrounds.

Figure 2 is the original distribution of the results of the regional culture test. Figure 3 is the smoothed curve of the original test results.

The test results were divided into five levels according to the test scores by the following criteria:

- Level A: score higher than $m+1.5\sigma$.
- Level B: score between than $m+0.5\sigma$ and $m+1.5\sigma$,
- Level C: score between $m-0.5\sigma$ and $m+0.5\sigma$,
- Level D: score between $m-1.5\sigma$ and $m-0.5\sigma$,
- Level E: score less than $m - 1.5\sigma$,

where m is the mean of the test scores and σ is the standard deviation. Figure 4 shows the partitioning of the five score levels.

4.2 One-way ANOVA

4.2.1 Statistical hypotheses

H1 Hypotheses on the relationships between internet usages and the academic achievements

H1-1 Hypotheses on the relationships between internet usages and the academic achievements of the learning field of language.

H1-1-a: The reasons of using internet are not different among the academic achievements of the learning field of language.

H1-1-b: The internet activities are not different

among the academic achievements of the learning field of language.

H1-1-c: The recognitions of internet functionalities are not different among the academic achievements of the learning field of language.

H1-2 Hypotheses on the relationships between internet usages and the academic achievements of the learning field of mathematics.

H1-2-a: The reasons of using internet are not different among the academic achievements of the learning field of mathematics.

H1-2-b: The internet activities are not different among the academic achievements of the learning field of mathematics.

H1-2-c: The recognitions of internet functionalities are not different among the academic achievements of the learning field of mathematics.

H1-3 Hypotheses on the relationships between internet usages and the academic achievements of learning field of natural science and living technology.

H1-3-a: The reasons of using internet are not different among the academic achievements of the learning field of natural science and living technology.

H1-3-b: The internet activities are not different among the academic achievements of the learning field of natural science and living technology.

H1-3-c: The recognitions of internet functionalities are not different among the academic achievements of the learning field of natural science and living technology.

H1-4 Hypotheses on the relationships between internet usages and the academic achievements of learning field of social studies.

H1-4-a: The reasons of using internet are not different among the academic achievements of the learning field of social studies.

H1-4-b: The internet activities are not different among the academic achievements of the learning field of social studies.

H1-4-c: The recognitions of internet functionalities are not different among the academic achievements of the learning field of social studies.

H2 Hypotheses on the relationships between the scores of the regional culture test and the academic achievements

H2-1: The scores of the regional culture test are not different among the academic achievements of the learning field of language.

H2-2: The scores of the regional culture test are not different among the academic achievements of the learning field of mathematics.

H2-3: The scores of the regional culture test are not different among the academic achievements of the learning field of natural science and living technology.

H2-4: The scores of the regional culture test are not different among the academic achievements of the learning field of social studies.

H3 Hypotheses on the relationships between the internet usages and the students' backgrounds

H3-1: Hypotheses on the relationships between the reasons of using internet and the students' backgrounds

H3-1-a: The reasons of using internet are not different among the father' educations.

H3-1-b: The reasons of using internet are not different among the mother' educations.

H3-1-c: The reasons of using internet are not different among the parents' relationships.

H3-1-d: The reasons of using internet are not different among the father's guidance methods.

H3-1-e: The reasons of using internet are not different among the mother's guidance methods.

H3-1-f: The reasons of using internet are not different among the family economics.

H3-1-g: The reasons of using internet are not different among the social relationships.

H3-1-h: The reasons of using internet are not different among the extroversive behaviors.

H3-1-i: The reasons of using internet are not different among the introversive behaviors.

H3-1-j: The reasons of using internet are not different among the learning behaviors.

H3-2: Hypotheses on the relationships between the internet activities and the students' backgrounds

H3-2-a: The internet activities are not different among the father' educations.

H3-2-b: The internet activities are not different among the mother' educations.

H3-2-c: The internet activities are not different among the parents' relationships.

H3-2-d: The internet activities are not different among the father's guidance methods.

H3-2-e: The internet activities are not different among the mother's guidance methods.

H3-2-f: The internet activities are not different among the family economics.

H3-2-g: The internet activities are not different among the social relationships.

H3-2-h: The internet activities are not different among the extroversive behaviors.

H3-2-i: The internet activities are not different among introversive behaviors.

H3-2-j: The internet activities are not different among the learning behaviors.

H3-3: Hypotheses on the relationships between the recognitions of internet functionalities and the students' backgrounds

H3-3-a: The recognitions of internet functionalities are not different among the father' educations.

H3-3-b: The recognitions of internet functionalities are not different among the mother' educations.

H3-3-c: The recognitions of internet functionalities are not different among the parents' relationships.

H3-3-d: The recognitions of internet functionalities are not different among the father's guidance methods.

H3-3-e: The recognitions of internet functionalities are not different among the mother's guidance methods.

H3-3-f: The recognitions of internet functionalities are not different among the family economics.

H3-3-g: The recognitions of internet functionalities are not different among the social relationships.

H3-3-h: The recognitions of internet functionalities are not different among the extroversive behaviors.

H3-3-i: The recognitions of internet functionalities are not different among the introversive behaviors.

H3-3-j: The recognitions of internet functionalities are not different among the learning behaviors.

H4 Hypotheses on the scores of the regional culture test among the students' backgrounds

- H4-1:** The scores of the regional culture test are not different among the father' educations.
- H4-2:** The scores of the regional culture test are not different among the mother' educations.
- H4-3:** The scores of the regional culture test are not different among the parents' relationships.
- H4-4:** The scores of the regional culture test are not different among the father's guidance methods.
- H4-5:** The scores of the regional culture test are not different among the mother's guidance methods.
- H4-6:** The scores of the regional culture test are not different among the family economics.
- H4-7:** The scores of the regional culture test are not different among the social relationships.
- H4-8:** The scores of the regional culture test are not different among the extroversive behaviors.
- H4-9:** The scores of the regional culture test are not different among the introversive behaviors.
- H4-10:** The scores of the regional culture test are not different among the learning behaviors.

H5 Hypotheses on the relationships between the scores of the regional culture test and the internet usages

- H5-1:** The scores of the regional culture are not different among the times spending in internet.
- H5-2:** The scores of the regional culture are not different among frequencies of using internet.
- H5-3:** The scores of the regional culture test are not different among locations of using internet.
- H5-4:** The scores of the regional culture test are not different among the reasons of using internet.
- H5-5:** The scores of the regional culture test are not different among the internet activities.
- H5-6:** The scores of the regional culture test are not different among the recognitions of internet functionalities.

4.2.2 Results of statistical tests of one-way ANOVA

Of the above hypotheses, all of them were not different except for the following conclusions:

- (H1-1-c) The recognitions of internet functionalities are different among academic achievements of the learning field of language at a significant level of 0.05 where the students with higher academic achievements have better recognitions of internet functionalities.
- (H1-2-c) The recognitions of internet functionalities are different among academic achievements of the learning field of mathematics at a significant level of 0.05

where the students with higher academic achievements have better recognitions of internet functionalities.

- (H1-3-c) The recognitions of internet functionalities are different among academic achievements of the learning field of nature science and living technology at a significant level of 0.05 where the students with higher academic achievements have better recognitions of internet functionalities.
- (H1-4-c) The recognitions of internet functionalities are different among academic achievements of the learning field of social studies at a significant level of 0.05 where the students with higher academic achievements have better recognitions of internet functionalities.
- (H2-1) The scores of the regional culture test are different among the academic achievements of the learning field of language at a significant level of 0.05 where the students with higher academic achievements have higher scores of the regional culture test.
- (H2-2) The scores of the regional culture test are different among the academic achievements of the learning field of mathematics at a significant level of 0.05 where the students with higher academic achievements have higher scores of the regional culture test.
- (H2-3) The scores of the regional culture test are different among the academic achievements of the learning field of natural science and living technology at a significant level of 0.05 where the students with higher academic achievements have higher scores of the regional culture test.
- (H2-4) The scores of the regional culture test are not different among the academic achievements of the learning field of social studies at a significant level of 0.05 where the students with higher academic achievements have higher scores of the regional culture test.
- (H4-9) The scores of the regional culture test are different among the introversive behaviors at a significant level of 0.05 where
 - (i) 5 (confident) > 6 (extremely dependent)
 - (ii) 5 (confident) > 7 (emotional stable).
- (H4-10) The scores of the regional culture test are different among the learning behaviors at a significant level of 0.05 where
 - (i) 3 (studying hard) > 2 (distracted)
 - (ii) 3 (studying hard) > 4 (passive and careless)
- (H5-5) The scores of the regional culture test are different between the students who can use

emails and the students who can not use email at a significant level of 0.05 where the students who can use emails have better scores.

- (H5-6) The scores of the regional culture test are different between the students who recognize online game as an internet functionality and the students who do not recognize online game as an internet functionality at a significant level of 0.05 where the students who do not recognize online game as an internet functionality have better scores.
- (H5-6) The scores of the regional culture test are different between the students who recognize MSN (or Yahoo Messenger) as an internet functionality and the students who do not recognize MSN (or Yahoo Messenger) as an internet functionality at a significant level of 0.05 where the students who recognize MSN (or Yahoo Messenger) as an internet functionality have better scores.

5. Conclusions

We presented a case study to discuss the internet usages of primary school students and the exploring capabilities of using internet on regional culture course. 226 students of grade five from a primary school in Taiwan were selected as samples. We designed the questionnaire to analyze the internet usages and behaviors of these students including time, frequency, location, reason, internet activity, and recognition of internet functionality. We designed questions for the regional culture test and conducted experiments to analyze the relationships between the internet usages and the scores of the regional culture test. Furthermore, we analyzed the relationships among students' backgrounds, academic achievements, internet usages, and the scores of the regional test.

As for the future studies, a pre-test of regional culture might be conducted before the experiment begins. This can help researchers compare the learning performances before and after the experiment.

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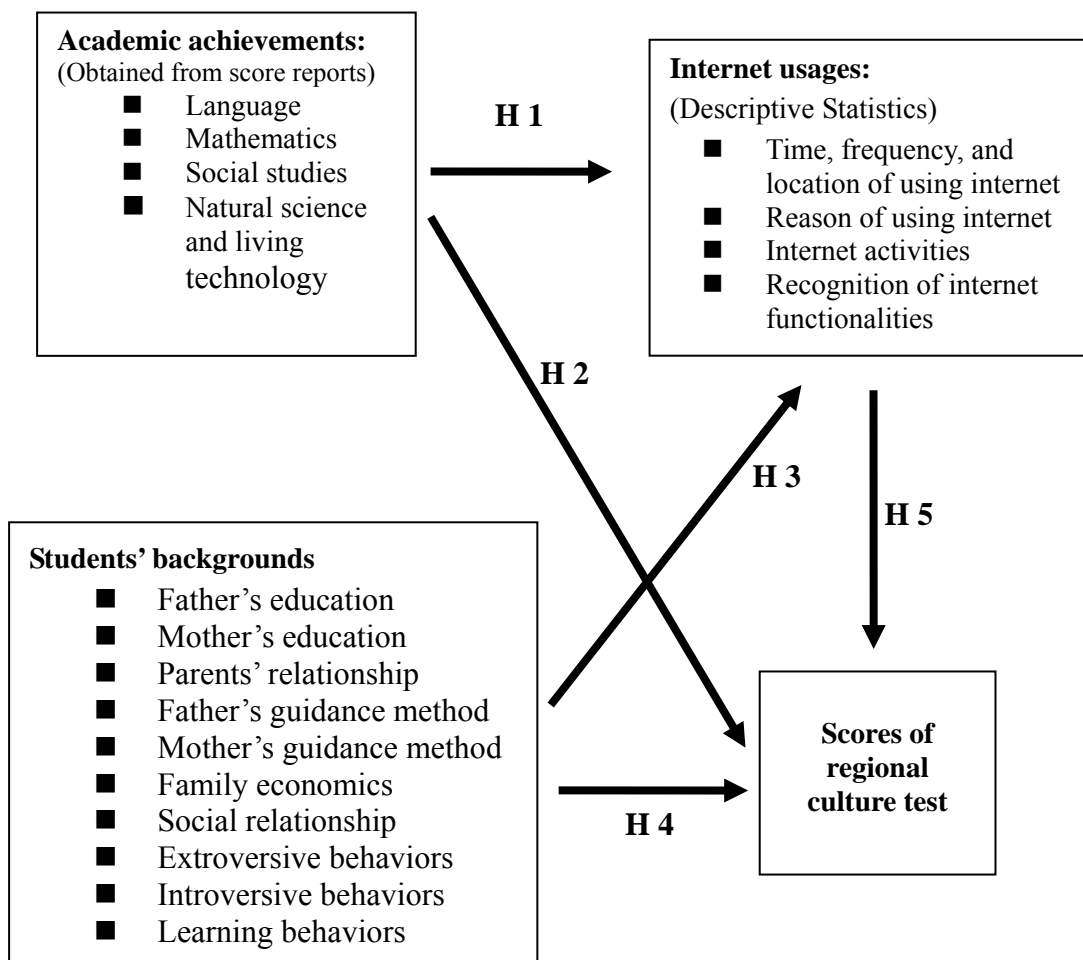
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Remarks:

H1: Hypotheses on the relationships between internet usages and the academic achievements

H2: Hypotheses on the relationships between the scores of the regional culture test and the academic achievements

H3: Hypotheses on the relationships between the internet usages and the student s' backgrounds

H4: Hypotheses on the scores of the regional culture test among the students' backgrounds

H5: Hypotheses on the relationships between the scores of the regional culture test and the internet usages

Figure 1: The Conceptual diagram of the research structure

Table 1: The Descriptive statistics of time, frequency and location

Time			Frequency			Location		
Value (daily)	N.	%	Value (weekly)	N	%	Value	N	%
< 1 hr	100	44.2	< once	19	8.4	Home	161	71.2
1~2 hr	79	35.0	1~3 times	162	71.7	Computer classroom	44	19.5
2~3 hr	21	9.3	4~6 times	26	11.5	Internet cafe	13	5.8
3~4 hr	26	11.5	Everyday	19	8.4	Friends' house	4	1.8
Total	226	100	Total	226	100	Others	3	1.3
						Not answered	1	0.4
						Total	226	100

Table 2: Descriptive statistics of reason of using internet, internet activities, recognition of internet functionalities

Reason of using internet ^a			Internet activities ^a			Recognition of internet functionalities ^a		
Value	N	% ^b	Value	N	% ^b	Value	N	% ^b
Doing homework	122	54.0	Searching for information	135	59.7	Email	176	77.9
Obtaining information	99	43.8	Downloading software	146	64.6	Online game	200	88.5
Killing time	140	61.9	Reading News	30	13.3	Information searching	190	84.1
Making friend	44	19.5	Playing game	173	76.5	Web messenger ^c	156	69.0
Accessing email	84	37.2	Chatting	76	33.6	Information retrieval	150	66.4
Others	17	7.5	Browsing website	64	28.3	Knowledge acquirement	167	73.9
			Using email	78	34.5	Information providing to others	153	67.7
			Others	5	2.2	Others	4	1.8

Remarks:

- a:** More than one value selected for a single questions;
- b:** Percentages are calculated by a 226- participants basis.
- c:** MSN or Yahoo Messenger.

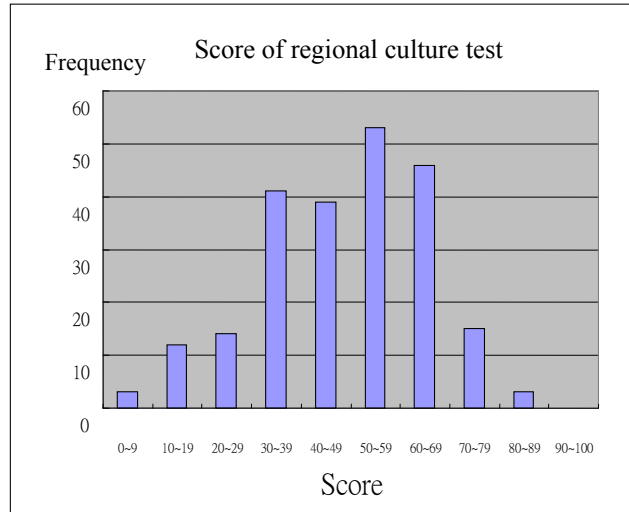


Figure 2: The score distribution of regional culture test.

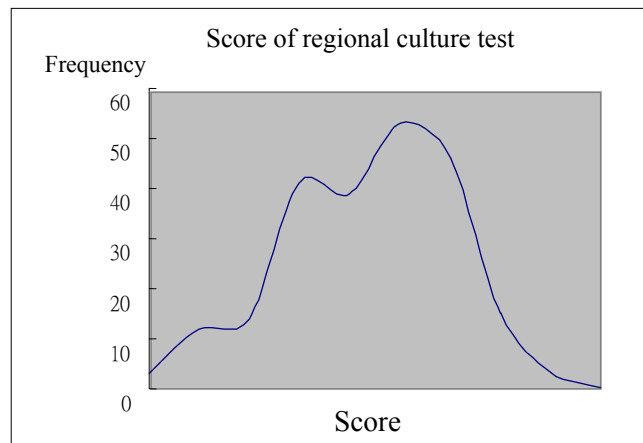


Figure 3: The smoothed curve of the score distribution of Figure 2.

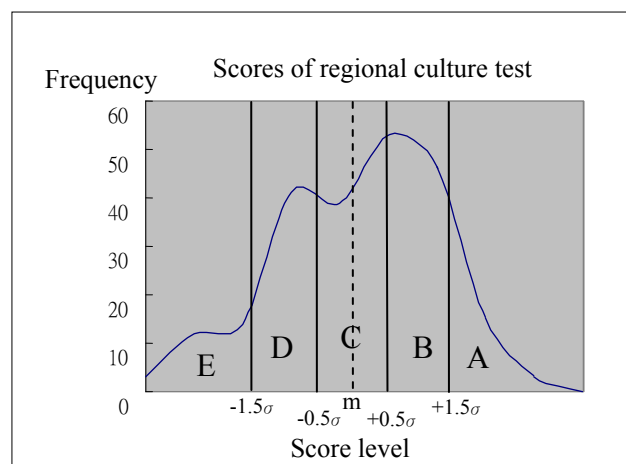


Figure 4: The five score levels (A, B, C, D, and E) for Figure 3.

Table 3: The Descriptive statistics of the students' backgrounds

Father's education		Mother's education		Parents' relation		Father's guidance		Mother's guidance		Family Econom.		Social relation		Extro. Beha		Intro. Beha.		Learn. Beha.	
V*	N#	V	N	V	N	V	N	V	N	V	N	V	N	V	N	V	N	V	N
1	4	1	3	1	188	1	157	1	174	1	5	1	78	1	15	1	27	1	61
2	0	2	4	2	7	2	29	2	20	2	104	2	16	2	14	2	13	2	61
3	6	3	6	3	1	3	32	3	23	3	108	3	64	3	84	3	50	3	37
4	44	4	39	4	22	4	2	4	2	4	3	4	12	4	3	4	5	4	46
5	118	5	132	5	8	M	6	M	7	5	6	5	47	5	4	5	41	5	17
6	36	6	30									6	5	6	7	6	15	6	0
7	13	7	10									7	2	7	90	7	67	7	4
8	3	8	0									8	2	8	9	8	8	8	0
9	0	9	0																
M	2	M	2																
Total	226		226		226		226		226		226		226		226		226		226

Remarks:

- *: V = Value.
- #: N = Frequency.
- In Father's education column: Value 1= illiteracy; Value 2= no diploma but can read; Value 3 = elementary; Value 4 = junior high; Value 5 = senior high; Value 6 = junior college; (community college); Value 7 = bachelor; Value 8 = mater; Value 9 = doctoral; M = missing value.
- In Mother's education column: same as Father's Education column.
- In Parents' relation column: Value 1 = living together; Value 2 = not living together; Value 3 = separation; Value 4 = divorced; Value 5 = others.
- In Father's guidance column: Value 1 = democratic; Value 2 = authoritative; Value 3 = the way of laissez-faire (allow to do or let do); Value 4 = others, M = missing value.
- In Mothers' guidance column: the same as Father's guidance column.
- In Family economics column: Value 1 = rich; Value 2 = above average; Value 3 = average; Value 4 = poor; Value 5 = very poor.
- In Social relation column: Value 1 = nice; Value 2 = quarreled; Value 3 = gregarious (getting on well with others); Value 4 = egocentric; Value 5 = vivacious; Value 6 = lukewarm (keep somebody at a distance); Value 7 = easy to trust somebody; Value 8 = suspicious and jealous.
- In Extroversion behaviors column: Value 1 = great leadership; Value 2 = aggressive; Value 3 = talkative; Value 4 = preferring to say filthy words; Value 5 = generous; Value 6 = wandered (preferring to walk around without purpose); Value 7 = enthusiastic; Value 8 = preferring to express an opposing view.
- In Introversion behavior column: Value 1 = cautious; Value 2 = flinched (easy to draw back from something); Value 3 = quiet; Value 4 = very quite; Value 5 = confident; Value 6 = extremely dependent (relying on others); Value 7 = emotional stable; Value 8 = gloomy.
- In Learning behaviors column: Value 1 = concentrated; Value 2 = distracted; Value 3 = studying hard; Value 4 = passive and careless; Value 5 = perseverant and patient; Value 6 = giving up halfway; Value 7 = thoughtful and inquiring; Value 8 = partially prejudiced against (or in favor of) some learning subjects.