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DOMINANT LEARNING STYLES: A CASE OF FIRST-YEAR COMPUTER SCIENCE STUDENTS

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ABSTRACT

Aim: This research determined the dominant learning styles of first-year computer science students. **Study Design:** This is descriptive research that employed a purposive sampling technique to select the study participants. **Place and Duration of Study:** This study determined the dominant learning style preferences of first-year national diploma computer science students of the Federal Polytechnic, Idah, Nigeria for two academic sessions. **Methodology:** The study conducted a survey, utilising data collected from a total of 283 students, 191 students during the 2017/2018 and 92 students during the 2018/2019 academic sessions. All participants were asked to fill out the Felder-Soloman Index of Learning Style questionnaire (FS-ILS) offline. FS-ILS consists of 44 items distributed into a pair of four dimensions. **Results:** This study found that the students have preferences for certain learning styles as defined by the Index of Learning Style instrument. The results revealed that the dominant learning styles are: sensing (76.44%, 70.65%), visual (58.12%, 71.74%), and sequential (80.10%, 68.48%) in the two population samples respectively. Furthermore, the thin difference discovered between the reflective learners (63.87%) in the 2017/2018 academic session and active learners (61.96%) in the 2018/2019 academic session means that they can do well as both active and reflective learners. **Conclusion:** Educating students to understand their learning style enables them to be cognizant of ways to improve their learning, thereby providing them with a more effective teaching process.

Keywords: Learning Style, Dominant Learning Styles, Felder-Silverman Learning Style Model, Index of Learning Style.

INTRODUCTION

Every student is different and has different learning styles when analysing information[1], [2]. Learning style describes how individual students process, perceive, present, and understand the information provided[3]. Therefore, each student has a different learning style that affects the processing, perception, presentation, and understanding of information. For instance, when a crop of students is learning how to build a clock, some students will understand the clock process by following verbal or written instructions as the others must physically manipulate the watch to internalise and conceptualise the teaching exercise.

Researchers have developed diverse models for detecting learning styles including [4],[5],[3]. Each one of them proposes different descriptions and learning style classifications. Generally, learning style models classify students according to where they fit on some scales about the ways they receive and process information [6]. In this study, the Felder-Silverman learning style model (FSLSM) was used because it describes the learning style of a learner in more detail, distinguishing between preferences in four dimensions [3]. According to the FSLSM model, each learner has a preference on four (4) distinct dimensions: Active/Reflective, Sensing/Intuitive, Visual/Verbal, and Sequential/Global. In the first dimension, **Active/Reflective**, the learners are characterized according to the way they prefer to **process** information. Active learners like to learn by trying things out and studying in a group. In contrast, reflective learners learn by thinking through things and reflecting on them. They also prefer to study alone. In the second dimension, **Sensing/Intuitive**, the learners are characterized according to the type of information they preferentially perceive (i.e. **perception)**. Sensing learners like to learn from concrete materials that deal with facts and real-life situations.

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In contrast, intuitive learners like to learn from abstract materials that deal with ideas and theories. In the third dimension, **Visual/Verbal**, the learners are characterized according to the way they prefer to **input** external information in their memories (i.e. the sensory channel through which external information is most effectively perceived). Visual learners prefer to get new information in pictures, diagrams, graphs, charts, or maps while verbal learners prefer to get new information through written documents or spoken words. Lastly, in the fourth dimension, **Sequential/Global**, the learners are characterized according to their progression towards **understanding** information. Sequential learners prefer to learn in linear steps, usually working their ways to the solutions one step at a time while global learners learn in large leaps and prefer a higher degree of freedom in their learning process. Furthermore, they tend to absorb learning material almost randomly without seeing connections but after they have learnt enough materials they suddenly get the whole picture. There are varied learning style instruments available to assess learner's styles such as the Canfield Learning Styles Inventory (CLSI) [7], Memletics Learning Styles Inventory [1], the Myers-Briggs Type Indicator (MBTI) Learning Style Inventory and Kolb's Learning Style Inventory [8], and Felder-Soloman Index of Learning Style [9]. This study utilized the Felder-Soloman Index of Learning Style instrument because it is mostly applied in the sciences and engineering to determine students' learning styles. Furthermore, it has been proven to have passed the validity and reliability tests [10],[11], [12].The Felder-Soloman Index of Learning Style (FS-ILS) was developed by Felder and Soloman in 1991 [9],[8] to assess the Felder-Silverman Learning Style Model. It is a 44-item questionnaire that assesses learning preferences on four dimensions which is an opposing pair of categories which are: active/reflective, sensing/intuitive, visual/verbal, and sequential/global [2]. It is generally believed that matching the learning styles of students with the mode of instruction maximizes learning for students [13],[7],[1]. This shows that both learners and teachers must understand learners' learning styles, as this can provide valuable

information to create meaningful learning experiences and more effective learning. However, [14] opine that lecturers may not always share instruction materials and learning experiences that match students' learning preferences. More so, Felder and Brent warned against just matching teaching styles with learning styles [8]stating that it is inimical to label individual students and tailor instructions to fit their preferences. They believe that the most important application of learning styles is to help teachers design a balanced teaching approach that addresses the learning needs of all their students. The use of FS-ILS guides teachers on the diversity of learning styles within their classes and helps them design instructions that address the learning needs of the students. Its use gives individual students insights into their possible learning strengths and weaknesses. In short, FS-ILS is a veritable tool as long as it is used to help teachers achieve balanced course instruction and to help students understand their learning strengths and areas for improvement. It is thus imperative for teachers to understand the differences in their students' learning styles so that they can implement best practice strategies into their teaching activities, curriculum and assessments.

Purpose of the Study

This research determined the dominant learning styles of first-year computer science students. The specific objectives of the study are to:

- Identify the dominant learning styles of the first-year national diploma computer science students of the Federal Polytechnic Idah, Nigeria.
- Suggest some applications of the results in teaching-learning processes.

Research Questions

The under-listed questions were raised to support the findings of the study.

- What are the predominant learning styles of the first-year national diploma computer science students of the Federal Polytechnic Idah, Nigeria?
- What are the applications of the results in teaching-learning processes?

Statement of the Problem

Learning styles are considered to be important factors when developing instructional materials. To support the learning environment, teachers need to be aware of the different learning styles of their students. Also, the student's awareness of their learning styles can be a useful tool in their learning process to be able to analyse what style of learning can better help in improving their knowledge and influence them positively. However, few studies have been conducted to identify what learning styles are dominant among first-year computer science students to carefully strategise and provide a good basis for their teachers to formulate a teaching approach that addresses the learning needs of all students.

RELATED RESEARCH

Several studies have sought to define the dominant learning styles among crops of students using different learning style instruments. Reference [7] determined the dominant learning styles for each strand of students of the Senior High School (SHS) department of La Consolacion University, Philippines. Results showed that according to the Canfield Learning Styles Inventory (CLSI), most SHS students are Social learners. Reference [1] collected some learning style data as part of a study designed to assess learning styles across first-year students of the University of Tasmania, Australia. Utilizing the Memletics Learning Styles Inventory, their findings included that there are marked preferences for some learning styles over others. In the study of [15], the index of learning style questionnaire was administered to undergraduate anatomy students to determine their preferred learning styles. The results of their study found that the students' preferred learning styles were active (54.9%), sensing (85.1%), visual (81.2%), and sequential (74.4%). In another study conducted by [1] on the first-year medical students, it was reported that the students have preferences for visual (80.8%) and sequential (60.5%) learning styles, suggesting that these students preferred to learn through demonstrations and diagrams and linearly and sequentially. Furthermore, [16]compared the dominant learning styles in the high-level students from face-to-face and distance education modalities. The study concluded that in both groups of students the active, sensitive, visual and sequential learning style is dominant thus, revealing the urgency of changes in the teaching strategies towards meaningful learning. This present study employs a quantitative approach to determine the dominant learning styles among first-year national diploma computer science students using the Felder-Soloman Index of Learning Style (FS-ILS) instrument. Furthermore, suggestions were made on the applications of the results in teaching-learning processes. So far, there is no existing published data with regards to the use of FS-ILS to determine the dominant learning styles of first-year national diploma computer science students schooling in the Federal Polytechnic, Idah, Nigeria. It is hoped that this study would be beneficial in determining the academic needs of the first-year computer science students to create more responsive classrooms to their needs; as well as maximize their learning experience in the Polytechnic by providing them the appropriate tools to learn the skills they need to excel in their academics.

METHODOLOGY

Participants

The participants of this study were the first-year national diploma students admitted to study computer science at the Federal Polytechnic, Idah, Nigeria. They made a sample population of 191 and 92 students for 2017/2018 and 2018/2019 academic sessions respectively. The demographic characteristics (sex, age range, and marital status) of the students are presented in Table 1.

Table1 Demographic characteristic of the students (Source: Field Work)

	2017/2018 Academic Session (Number)	[a] Percent (%)	2018/2019 Academic Session (Number)	[a] Percent (%)
SEX				
Male	128	67.01	60	65.22
Female	63	32.99	32	34.78
AGE RANGE				
Below 20 years	76	39.79	40	43.48
20-39 years	115	60.21	52	56.52
MARITAL STATUS				
Single	190	99.48	91	98.91
Married	1	0.52	1	1.09
Population Sample	**191**		**92**	

[a] Percentages are to 2 decimal places.

Experimental Setup/Procedure

This is descriptive research that employed a purposive sampling technique to select the study participants. The purposive sampling technique is adopted when a researcher consciously chooses research participants because of the qualities the participants possess [17]. The experiment was conducted in the second semesters of 2017/2018 and 2018/2019 academic sessions. To assess the students' learning styles, all participants were asked to fill out the Felder-Soloman Index of Learning Style questionnaire (FS-ILS) offline. FS-ILS consists of 44 items distributed into a pair of four dimensions: active/reflective learning styles dimension (questions 1, 5, 9, 13, 17, 21, 25, 29, 33, 37, and 41), sensing/intuitive learning style dimension (questions 2, 6, 10, 14, 18, 22, 26, 30, 34, 38, and 42), visual/verbal learning style dimension (questions 3, 7, 11, 15, 19, 23, 27, 31, 35, 39, and 43) and sequential/global learning style dimension (questions 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, and 44). See Appendix I. The respondents were guided and questions were explained to them where necessary. They were asked to choose only one answer for each of the "a" or "b" choices. See Appendix II for the screenshots of their responses for the two academic sessions analysed in Microsoft Excel 2007.The FS-ILS instrument was administered to a total population size of 283 which is a composition of 191 and 92 students. The sample size of 191 students was derived by applying Yamane's formula [18] to a total population size of 366 of the first-year students for the 2017/2018 academic sessions. However, the whole population size of 92 was used for the crop of first-year national diploma students for the 2018/2019 academic sessions.

Below is the mathematical formula for Yamane's method of calculating a reliable sample size:

$$n = \frac{N}{1 + N(e)^2}$$

Where: n is the sample size, N is the population under study, and e is the margin error (i.e., the acceptable sampling error with 0.05 assumed).

RESULTS

The students' FS-ILS scores were analysed to determine their learning style preferences. Precisely, each student has four FS-ILS scores, each indicating a student's learning preference in a dimension. Table 2 shows the result of the analysis. As can be seen from the table, the preferred learning style is the one whose percentage is higher in each pair of dimensions in each academic session. The results show that the dominant learning styles are (active, sensory, visual, and sequential) and (reflective, sensory, Visual, and Sequential) for 2017/2018 and 2018/2019 academic sessions. Chart1 shows the frequency of the students' learning styles for the 2017/2018 academic session and Chart 2 shows the frequency of the students' learning styles for the 2018/2019 academic session.

Table 2 Learning style dimensions in numbers and percentages (%) with the dominant learning styles(Source: Field Work)

Learning Style Dimension	2017/2018 Academic Sessio	[b] Percent (%)	Dominant Learning Styles	2018/2019 Academic Sessio	[b] Percent (%)	Dominant Learning Styles
Active	69	36.13		57	61.96	Active
Reflective	122	63.87	Reflective	35	38.04	
Sensing	146	76.44	Sensing	65	70.65	Sensing
Intuitive	45	23.56		27	29.35	
Visual	111	58.12	Visual	66	71.74	Visual
Verbal	80	41.88		26	28.26	
Sequential	153	80.10	Sequential	63	68.48	Sequential
Global	38	19.90		29	31.52	
Total Population Sample	**191**			**92**		

[b] Percentages are to 2 decimal places.

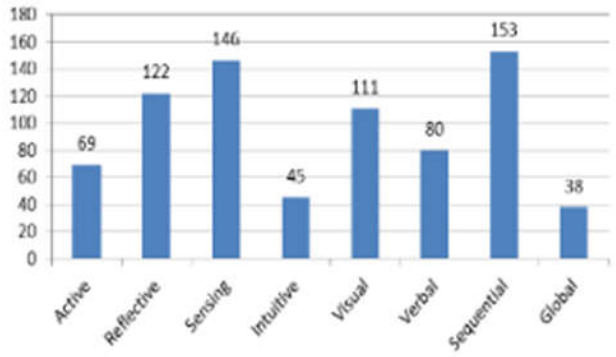

Chart 1 The frequency of the students' learning styles for 2017/2018 Academic Session

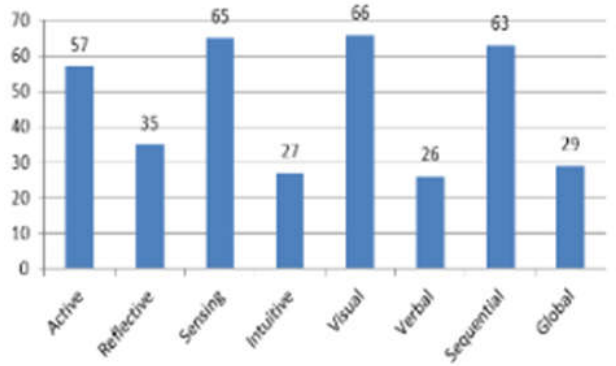

Chart 2 The frequency of the students' learning styles for 2018/2019 Academic Session

RESULTS AND DISCUSSION

The current study determined the dominant learning styles of first-year national diploma computer science students using the Felder-Soloman Index of Learning Style questionnaire. The results presented in Table 2 revealed that the dominant learning styles of the students pursuing a national diploma in computer science are *sensing* (76.44%,70.65%), *visual* (58.12%,71.74), and *sequential* (80.10%, 68.48%). This study collaborates with earlier studies by [15], [19], [16] pointing out that students with science backgrounds are sensing, visual, and sequential learners and they can also learn well either as active learners or reflective learners. The students with the sensing learning style are practical-oriented towards details, facts, and figures. They tend to do well in learning facts and follow established approaches to solving problems. The visual learners prefer information to be presented to them through visual presentations of materials (diagrams, charts, graphs, and pictures) while the sequential learners prefer to organise information in a linear, orderly manner. They all learn best when learning materials are

presented to them in their preferred learning styles. Furthermore, the analysis showed minor variations in the *active* (61.96%) /*reflective* (63.87%) dimension for2018/2019 and 2017/2018 academic sessions. This is also consistent with the study of [15]. Observation during the pilot study revealed that some students could not decide which of the choices to tick in certain pairs as they claimed that the two pairs of choices in the dimensions apply to them equally. One interpretation of this claim is that such students have mild preferences for such learning style dimensions. They can learn well in both situations. Again, the learning style dimensions must not be treated as the opposite because students could be classified into both poles of a dimension at the same time [3],[2]. Putting this in the right perspective, saying a student is either a sequential or a global learner may not be out rightly correct. All sequential learners sometimes behave like global learners and vice versa, depending on the learning strength of their preference for sequential learning; and this holds for the remaining dimensions.

Application of the results in teaching-learning processes

Teachers need to use a variety of instructional strategies to cater to the diverse needs of the learners. For the active/reflective dimension, there appears to be no distinct preference between the two population samples. This means that the students can do well in both active and reflective learning environments. Imperatively, teachers need to ensure that active teaching style is accompanied by reflective teaching style. They need to allow the **active/reflective learners** to discuss concepts; theories and techniques in groups to try out things by themselves and at the same time allow them to think through information individually and then bring them together as a group to compare their ideas. To get the most out of the **sensing learners**, teachers have to illustrate their teachings with facts and real-life data and state clearly what they mean in their learning materials. To facilitate learning for **visual learners**, teachers should ensure that verbal information is accompanied by pictures, diagrams, graphs, charts, and maps. Everyone learns more when information is presented both visually and verbally. To maximize learning among **sequential learners**, teachers should lay out materials in clear sequential steps and also allow them to work their ways to the solutions one step at a time.

Limitations and suggestions for future research

Despite the significance of this study, a few limitations have been noted. Firstly, this study did not find the correlation between learning styles and the demographic characteristics of the students. Secondly, the population sample is small as it is based on only two (2) academic sessions. Further research should consider using a population sample from at least three (3) consecutive academic sessions. This will validate the results of this study and emphatically state the dominant learning styles of the first-year national diploma students enrolled in the computer science department of the Federal Polytechnic Idah, Nigeria; Thirdly, although, this study is particularly focused on first-year students of a particular Nigerian Polytechnic students, the adoption of non-probability sampling technique (i.e. purposive sampling) may make it impossible for its findings to be generalised to the entire first-year students in Nigerian Polytechnics. Lastly, learning style is assumed to be a generally flexibly stable learner characteristic over a relatively long time as such the learners may have mild, moderate, or strong affinities with their particular learning styles [3]. This is to say that learning styles in the different dimensions are not out rightly fixed to either pole, say sequential or global. For instance, a learner should be classified as a mild/moderate/strong sequential learner or mild/moderate/strong global learner. To further buttress this point, [3] argued that the educational environment must be designed in a manner that supports the students who have strong preferences. For instance, strong sequential students; otherwise, they might experience many difficulties in their learning. Further study should classify the learners according to these affinities.

This study calls attention to the following points:

- Every student has a pair of four learning style dimensions as defined by the Felder-Silverman learning style model but some learning styles are more dominant than the others.
- It is inimical to label individual students and tailor instructions to fit their dominant learning style preferences.

This study's strong point is that learning styles should be applied in teaching-learning processes to help teachers design a balanced teaching approach that addresses the learning needs of all their students while concentrating more on their dominant learning styles.

CONCLUSION

This study determined the dominant learning style preferences of first-year national diploma computer science students of the Federal Polytechnic, Idah, Nigeria for two academic sessions. This was based on Felder Silverman Learning Style Model and used the Index of Learning Style instrument to assess the learning styles. The study revealed that the students understudied are dominantly sensing, visual and sequential learners. In addition, it revealed that they can as well as be both active and reflective learners. The study further suggested ways to structure the teaching process to maximise students' retention of knowledge. Lastly, considering students' learning styles can be an important factor in improving students' success in their academics. Teachers need to prepare a few types of materials on the same topic and conduct their classes in various ways to ensure that they assist students to understand what they are teaching.

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Competing interests

Authors have declared that no competing interests exist.

Authors' Contributions

'Benson-Iyare, J. C.'conceived and designed the study, performed the data collection, managed the analyses of the study, and wrote the first draft of the manuscript. 'Ajisola, K. T.'managed the literature searches. 'Azikiwe, J. C.'wrote the second draft of the manuscript. All authors read and approved the final manuscript.

REFERENCES

1. Salas K, Lewis I, Dermoudy J. Learning styles of ICT specialisation students: Do differences in disciplines exist? Australian Educational Computing. 2014; 29(2).
2. Felder RM. Opinion: uses, misuses, and validity of learning styles. Advances in Engineering Education. 2020; 8(1):1-14.
3. Felder RM, Silverman LK. Learning and teaching styles in engineering education. Engineering Education. 1988; 78(7):674-

681. Proceeded by a preface in 2002: http://www.ncsu.edu/felderpublic/Papers/LS-1988.pdf.
4. Kolb DA. Experiential learning: Experience as the source of learning and development. Englewood Cliffs, NJ: Prentice-Hall; 1984.
5. Honey P, Mumford A. The manual of learning styles. Maidenhead: Peter Honey; 1982.
6. Alaoutinen S,Smolander K. Are computer science students different in learners? In: Proceedings of the 10th Koli Calling International Conference on Computing Education Research, Finland. 2010.
7. Sison M, Galvez R, Coronel JMD. Assessing the learning styles of Senior High School students of La Consolacion University Philippines: Implications in the Teaching-Learning Process. International Journal of Education and Research.2017; 5(12): 4552.
8. Felder RM, Brent R. Understanding student differences. Journal of Engineering Education.2005; 94(1): 57-72.
9. Felder RM, Soloman BA. Index of Learning Styles. North Carolina State University. 1991; http://www.ncsu.edu/effective_teaching/ILSdir/ILS-a.htm.
10. Felder RM, Spurlin J. Applications, reliability and validity of the Index of Learning Styles. International Journal on Engineering Education. 2005; 21(1): 103-112.
11. Zywno MS. A contribution on validation of score meaning for Felder-Soloman's Index of Learning Style. In: American Society for Engineering Education Annual Conference and Exposition. Session 2351. [quoted 27.6.2007]. Database EBSCOhost-Full Display. 2003.
12. Kaliska L. Felder's learning style concept and its Index of Learning Style questionnaire in the Slovak conditions. GRANT Journal ISSN 1805-062X, 1805-0638 (online), ETTN 072-11-00002-09-4. 2013.
13. Tulsi PK, Poonia MP, Anu P. Learning styles of Engineering students. Journal of Engineering Education Transformations.2016; 30(2): 44-49.
14. Chetty NDS, Handayani L, SahabudinNA, Ali Z, Hamzah N, Rahman NSA, Kasim S. Learning styles and teaching styles determine students' academic performances. International Journal of Evaluation and Research in Education (IJERE).2019; 8(3):610-615.
15. Quinn MM, Smith T, Kalmar EL, Burgoon JM. What type of learner are your students? Preferred learning styles of undergraduate gross anatomy students according to the index of learning styles questionnaire. Anatomical Sciences Education.2018; 11(4): 358-365.
16. Santo EE, SoaresCQ, Ferreira da Silveira EC, Oliveira RP. A learning comparative study from high level students of face-to-face and distance education. ISSN (enlinea). 2015; 2314-1530: 55-68. Presented at XV Comparative Education World Congress, 24th-28th June 2013, Buenos Aires, Argentina.
17. Etikan I, Musa SA, Alkassim RS. Comparison of convenience sampling and purposive sampling. American Journal of Theoretical and Applied Statistics. 2016; 5(1): 1-4.
18. Yamane T. Statistics, an Introductory Analysis (2nd ed.). New York: Harper and Row; 1967.
19. Hernandez-Torrano D, AliS, ChanCK. First year medical students' learning style preferences and their correlation with performance in different subjects with performance in different subjects within the medical course. BMC Med Educ.2017; 17:131.

Appendix I

Index of Learning Styles (ILS) Learning Style Questionnaire Directions

To complete the questionnaire please circle "a" or "b" to indicate your answer to every question. You may only choose one answer for each question and you must answer every question. If both "a" and "b" seem to apply to you, please choose the one that applies more frequently.

1. I understand something better afterI
   (a) try it out.
   (b) think it through.
2. I would rather be considered
   (a) realistic.
   (b) innovative.
3. When I think about what I did yesterday, I am most likely to get
   (a) a picture.
   (b) words.
4. I tend to
   (a) understand details of a subject but may be fuzzy about its overall structure.
   (b) understand the overall structure but may be fuzzy about details.
5. When I am learning something new, it helps me to
   (a) talk about it.
   (b) think about it.

6.If I were a teacher, I would rather teach a course
   (a) that deals with facts and real life situations.
   (b) that deals with ideas and theories.

7.I prefer to get new information in
   (a) pictures, diagrams, graphs, or maps.
   (b) written directions or verbal information.

8.Once I understand
   (a) all the parts, I understand the whole thing.
   (b) the whole thing, I see how the parts fit.

9.In a study group working on difficult material, I am more likely to
   (a) jump in and contribute ideas.
   (b) sit back and listen.

10.I find it easier
   (a) to learn facts.
   (b) to learn concepts.

11.In a book with lots of pictures and charts, I am likely to
   (a) look over the pictures and charts carefully.
   (b) focus on the written text.

12.When I solve math problems
   (a) I usually work my way to the solutions one step at a time.
   (b) I often just see the solutions but then have to struggle to figure out the steps to get to them.

13.In classes I have taken
   (a) I have usually got to know many of the students.
   (b) I have rarely got to know many of the students.

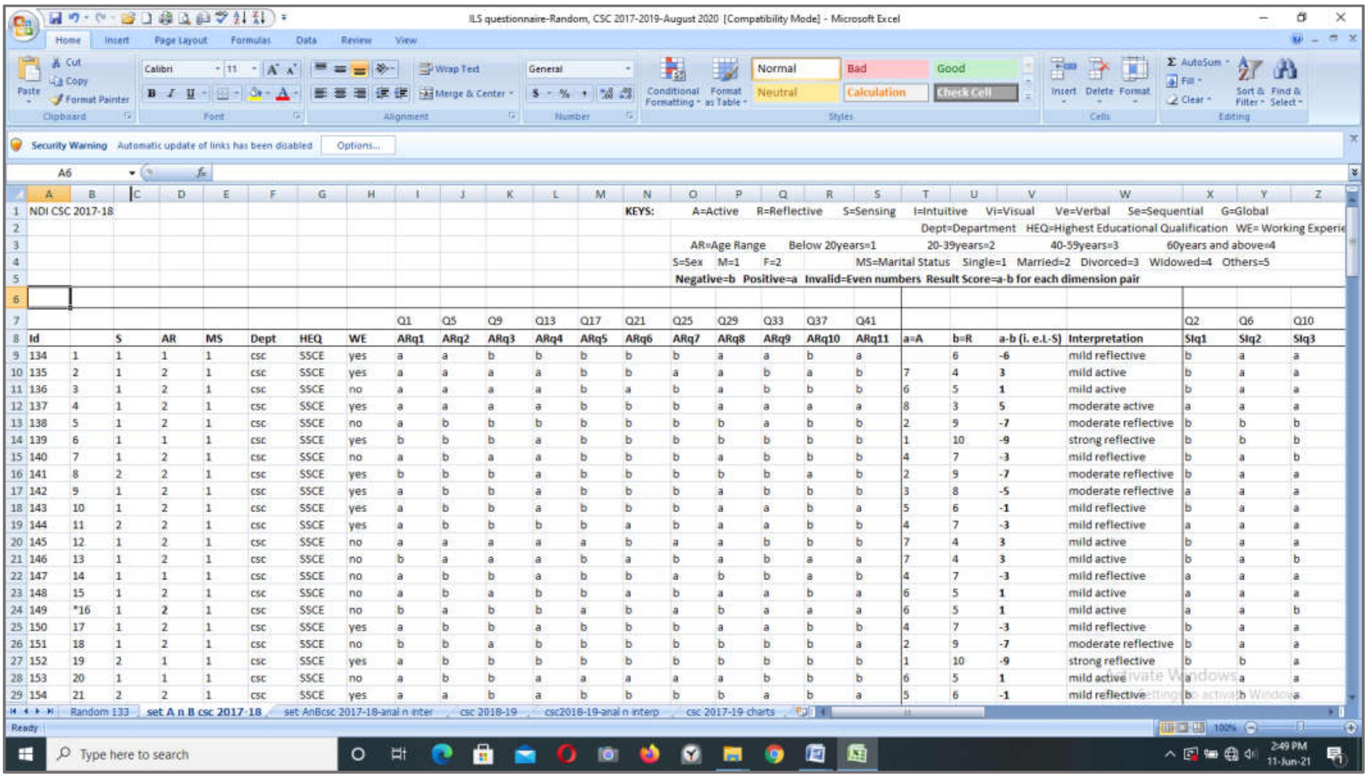
14.In reading non-fiction, I prefer
   (a) something that teaches me new facts or tells me how to do something.
   (b) something that gives me new ideas to think about.

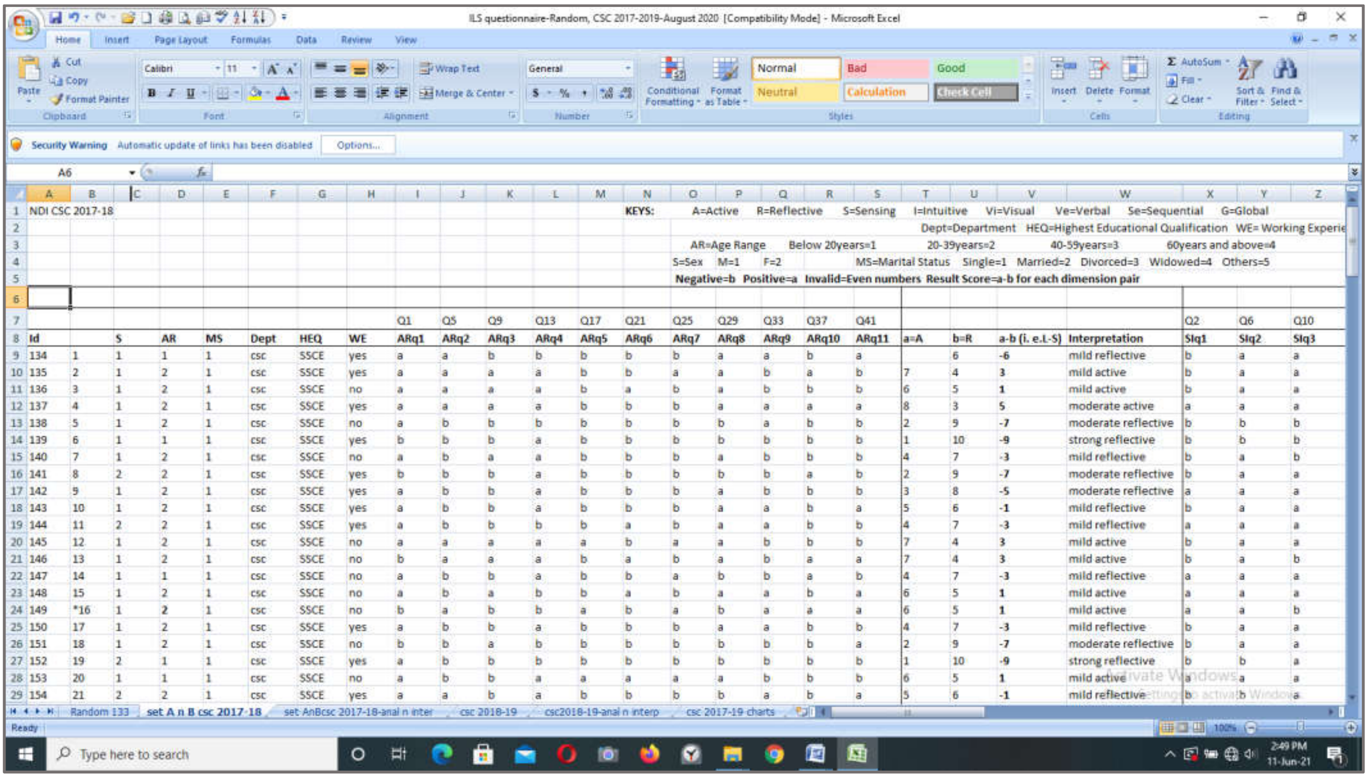
15.I like teachers
   (a) who put a lot of diagrams on the board.
   (b) who spend a lot of time explaining.

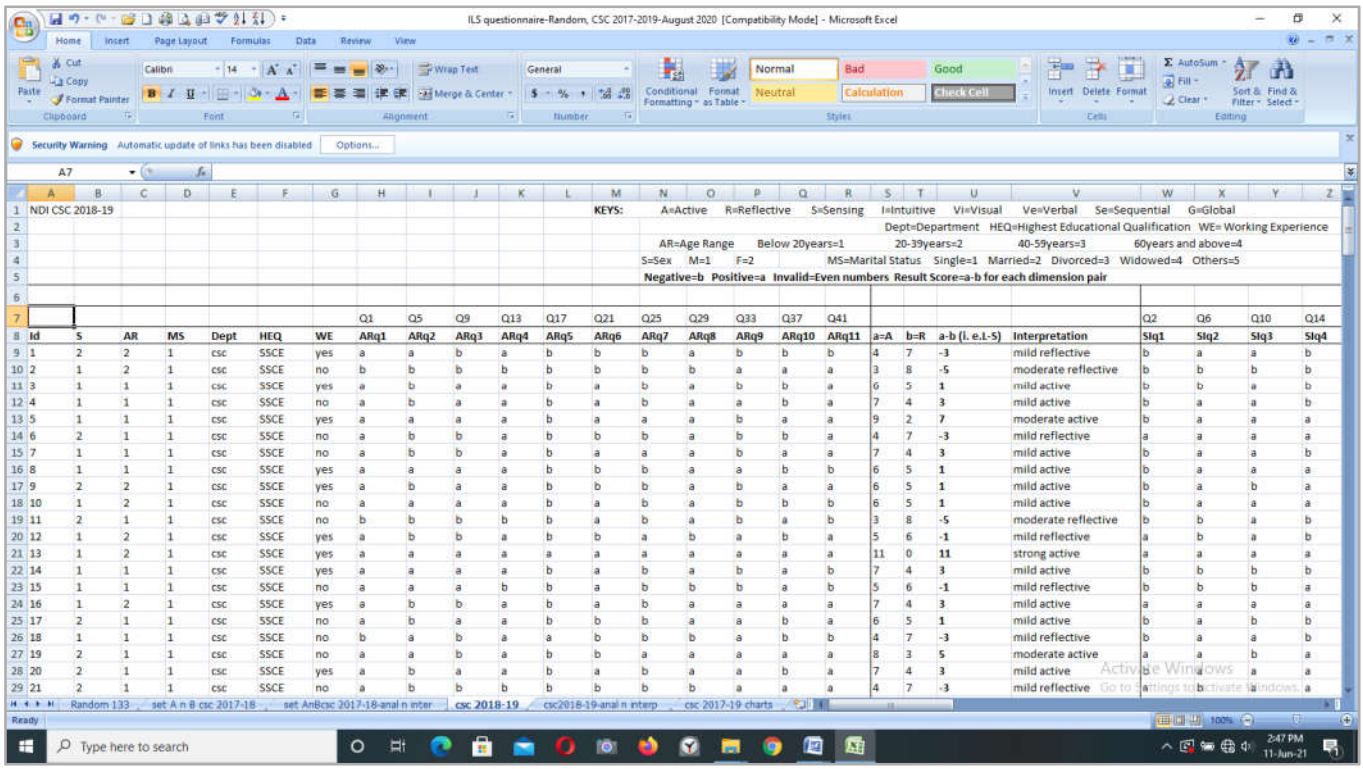
16.When I'm analysing a story or a novel
(a) I think of the incidents and try to put them together to figure out the themes.
(b) I just know what the themes are when I finish reading and then I have to go back and find the incidents that demonstrate them.
17.When I start a homework problem, I am more likely to
(a) start working on the solution immediately.
(b) try to fully understand the problem first.
18.I prefer the idea of
(a) certainty.
(b) theory.
19. I remember best
(a) what I see.
(b) what I hear.
20. It is more important to me that an instructor
(a) lay out the material in clear sequential steps.
(b) give me an overall picture and relate the material to other subjects.
21. I prefer to study
(a) in a group.
(b) alone.
22. I am more likely to be considered
(a) careful about the details of my work.
(b) creative about how to do my work.
23. When I get directions to a new place, I prefer
(a) a map.
(b) written instructions.
24. I learn
(a) at a fairly regular pace. If I study hard, I'll "get it."
(b) in fits and starts. I'll be totally confused and then suddenly it all" clicks."
25. I would rather first
(a) try things out.
(b) think about how I'm going to do it.
26. When I am reading for enjoyment, I like writers to
(a) clearly say what they mean.
(b) say things in creative, interesting ways.
27. When I see a diagram or sketch in class, I am most likely to remember
(a) the picture.
(b) what the instructor said about it.
28. When considering a body of information, I am more likely to
(a) focus on details and miss the big picture.
(b) try to understand the big picture before getting into the details.
29.I more easily remember
(a) something I have done.
(b) something I have thought a lot about.
30.When I have to perform a task, I prefer to
(a) master one way of doing it.
(b) come up with new ways of doing it.
31. When someone is showing me data, I prefer
(a) charts or graphs.
(b) text summarizing the results.
32. When writing a paper, I am more likely to
(a) work on (think about or write) the beginning of the paper and progress forward.
(b) work on (think about or write) different parts of the paper and then order them.
33. When I have to work on a group project, I first want to
(a) have a "group brainstorming" where everyone contributes ideas.
(b) brainstorm individually and then come together as a group to compare ideas.
34. I consider it higher praise to call someone
(a) sensible.
(b) imaginative.
35. When I meet people at a party, I am more likely to remember
(a) what they looked like.
(b) what they said about themselves.
36. When I am learning a new subject, I prefer to
(a) stay focused on that subject, learning as much about it as I can.
(b) try to make connections between that subject and related subjects.
37. I am more likely to be considered
(a) outgoing.
(b) reserved.
38. I prefer courses that emphasise
(a) concrete material (facts, data).
(b) abstract material (concepts, theories).
39. For entertainment, I would rather
(a) watch television.
(b) read a book.
40. Some teachers start their lectures with an outline of what they will cover. Such outlines are
(a) somewhat helpful tome.
(b) very helpful tome.
41.The idea of doing homework in groups, with one grade for the entire group,
(a) appeals tome.
(b) does not appeal tome.
42. When I am doing long calculations,
(a) I tend to repeat all my steps and check my work carefully.
(b) I find checking my work tiresome and have to force myself to do it.
43. I tend to picture places I have been
(a) easily and fairly accurately.
(b) with difficulty and without much detail.
44. When solving problems in a group, I would be more likely to
(a) think of the steps in the solution process.
(b) think of possible consequences or applications of the solution in a wide range of areas.

APPENDIX II

The screenshots of the students' responses for the two academic sessions analysed in Microsoft Excel 2007.







ILS questionnaire-Random, CSC 2017-2019-August 2020 [Compatibility Mode] - Microsoft Excel

NDI CSC 2018-19

KEYS: A=Active R=Reflective S=Sensing I=Intuitive VI=Visual Ve=Verbal Se=Sequential G=Global

Dept=Department HEQ=Highest Educational Qualification WE= Working Experience

AR=Age Range Below 20years=1 20-39years=2 40-59years=3 60years and above=4

S=Sex M=1 F=2 MS=Marital Status Single=1 Married=2 Divorced=3 Widowed=4 Others=5

Negative=b Positive=a Invalid=Even numbers Result Score=a-b for each dimension pair

							Q1	Q5	Q9	Q13	Q17	Q21	Q25	Q29	Q33	Q37	Q41						Q2	Q6	Q10	Q14
Id	S	AR	MS	Dept	HEQ	WE	ARq1	ARq2	ARq3	ARq4	ARq5	ARq6	ARq7	ARq8	ARq9	ARq10	ARq11	a=A	b=R	a-b (i. e.I.-S)	Interpretation		Slq1	Slq2	Slq3	Slq4
1	2	2	1	csc	SSCE	yes	a	a	b	a	b	b	b	a	b	b	b	4	7	-3	mild reflective		b	a	a	b
2	1	2	1	csc	SSCE	no	b	b	b	b	b	b	b	b	a	a	a	3	8	-5	moderate reflective		b	b	b	b
3	1	1	1	csc	SSCE	yes	a	b	a	a	b	a	b	a	b	b	a	6	5	1	mild active		b	b	a	b
4	1	1	1	csc	SSCE	no	a	b	a	a	b	a	b	a	a	b	a	7	4	3	mild active		b	a	a	b
5	1	1	1	csc	SSCE	yes	a	a	a	a	b	a	a	a	b	a	a	9	2	7	moderate active		b	a	a	a
6	2	1	1	csc	SSCE	no	a	b	b	a	b	b	b	a	b	b	a	4	7	-3	mild reflective		a	a	a	a
7	1	1	1	csc	SSCE	no	a	b	b	a	b	a	a	a	b	a	a	7	4	3	mild active		b	a	a	b
8	1	1	1	csc	SSCE	yes	a	a	a	a	b	b	b	a	a	b	b	6	5	1	mild active		b	a	a	a
9	2	2	1	csc	SSCE	yes	a	b	a	a	b	b	b	a	b	a	a	6	5	1	mild active		b	a	b	a
10	1	2	1	csc	SSCE	no	a	a	a	a	b	a	b	a	b	b	b	6	5	1	mild active		b	a	a	a
11	2	1	1	csc	SSCE	no	b	b	b	b	b	a	b	a	b	a	b	3	8	-5	moderate reflective		b	b	a	b
12	1	2	1	csc	SSCE	yes	a	b	a	a	b	a	b	a	b	b	a	5	6	-1	mild reflective		a	b	a	b
13	1	2	1	csc	SSCE	yes	a	a	a	a	a	a	a	a	a	a	a	11	0	11	strong active		a	a	a	a
14	1	1	1	csc	SSCE	yes	a	a	a	a	b	a	b	a	b	a	b	7	4	3	mild active		b	b	b	b
15	1	1	1	csc	SSCE	no	a	b	a	a	b	a	b	a	b	a	b	5	6	-1	mild reflective		b	b	b	a
16	1	2	1	csc	SSCE	yes	a	b	b	a	b	a	b	a	a	a	a	7	4	3	mild active		a	a	a	a
17	2	1	1	csc	SSCE	no	a	b	a	a	b	a	b	a	b	a	b	6	5	1	mild active		b	a	a	a
18	1	1	1	csc	SSCE	no	b	b	b	b	b	a	b	a	b	a	b	3	8	-5	moderate reflective		b	b	a	b
19	2	1	1	csc	SSCE	yes	a	b	b	a	b	b	a	b	a	b	a	5	6	-1	mild reflective		a	b	a	b
20	1	2	1	csc	SSCE	yes	a	a	a	a	a	a	a	a	a	a	a	11	0	11	strong active		a	a	a	a
21	1	1	1	csc	SSCE	yes	a	a	a	a	b	b	a	b	a	b	a	7	4	3	mild active		b	b	b	a
22	1	1	1	csc	SSCE	no	a	a	a	b	b	a	b	b	b	a	b	5	6	-1	mild reflective		b	b	b	a
23	1	2	1	csc	SSCE	yes	a	b	b	a	b	a	b	a	a	a	a	7	4	3	mild active		a	a	a	a
24	2	1	1	csc	SSCE	no	a	b	a	a	b	b	b	a	a	b	a	6	5	1	mild active		b	a	b	b
25	1	1	1	csc	SSCE	no	b	a	b	a	a	b	b	b	a	b	b	4	7	-3	mild reflective		b	a	a	b
26	2	1	1	csc	SSCE	no	a	a	b	a	b	b	a	a	a	b	a	8	3	5	moderate active		a	a	b	a
27	2	1	1	csc	SSCE	yes	a	b	a	a	b	a	b	a	a	b	a	7	4	3	mild active		b	a	a	a
28	2	1	1	csc	SSCE	no	a	b	b	b	b	b	b	b	a	a	a	4	7	-3	mild reflective		a	b	a	a

Random 133 | set A n B csc 2017-18 | set AnBcsc 2017-18-anal n inter | csc 2018-19 | csc2018-19-anal n interp | csc 2017-19 charts

Ready

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2:47 PM 11-Jun-21

Activate Windows Go to Settings to activate Windows.

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