

A STUDY OF MONGOLIAN SOME TEACHER TRAINING SCHOOL STUDENTS' LEARNING STYLES BY USING FELDER: SOLOMON INDEX OF LEARNING STYLES (ILS)

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ABSTRACT

Today, some Mongolian teachers cannot organize the training on the student's learning style. Sternberg states that by providing a variety of activities that match different learning styles, we will enable a greater number of students to demonstrate their intellectual ability and to experience success in our classrooms. This paper describes different learning styles, discusses a range of learning styles inventories and research in this area. The central purpose is to make professors aware that their students learn differently and to share strategies to address these different needs. It is up to the lecturer to teach the students and their preferred learning styles so that everyone can be successful. I entered the questions do which training strategies need to use and how to organize classroom teaching. The term "learning styles" speaks to the understanding that every student learns differently. It is important for educators to understand the differences in their students' learning styles so that they can implement best practice strategies into their daily activities, curriculum and assessments.

Keywords: Learning, Learning style, Quantum Learning, Classroom Management

INTRODUCTION

Teacher education has a great role to play in achieving the goals and objectives of education in a democratic society, and as a result, problems have always arisen and have always attracted the attention of scholars and researchers. Looking at the 200 years of the history of Mongolian education, which is a part of the historical development of world education, and it has preserved its own image, traditions and culture, and has survived to the present day.

From 1402 to 1930, the Mongols have a nomadic style of living, a Mongolian pedagogical heritage, a folk pedagogical experience, an effort to enlighten the mind, and a cherished treasure have been preserved and however from 1930 to the present not having enough of diagnosis, belief, national humanization methodology, communication, attitudes, respect for teachers and elders, learning, listening, preaching etiquette, responsibility for learning in accordance with the uniqueness, features, needs, interests and abilities of Mongolians, the diligence of the individual gradually diminished in quality, while executive education imitating the outside world prevailed.

From the 1970s to the mid-1980s, there was a broader focus on the management, development, and management of learning, taking into account the psychological basis of cognition and the neuro-physiological basis of human action.

Article 5.1.3 of the Basic Principles of Education of the Law on Education of Mongolia states that *“the methods and forms of education shall be free, open and varied in accordance with the needs and personal and developmental needs of students”*. Also article 2.1.8 of the Principles on Education Development in the State Policy on Education (2014-2024) states that *“citizens' lifelong learning needs, interests, talents, abilities, and developmental needs shall be met, and they shall be provided with equal opportunities, diversity, freedom, and openness”*.

The objective of our study is to determine the learning style of students based on scientific research methods and to emphasize the importance of using learning methods that are appropriate to the learning style. The following research questions were raised to guide the study:

1. What is a different learning style?
2. Why is it important for educators to understand the differences in their students' learning styles?

Learning

Researcher Brown has proposed an idea from traditional learning and *“learning is a process of acquiring knowledge and skills as a result of experimenting, studying and learning”* (1987, p. 6), famous Czech psychologist Jiří Mareš *“Effective individual processes that aim to change themselves by recognizing environmental and social environments. The result is that individuals change their behavior, actions, personal characteristics, and patterns”* (Mareš, 1998), *“Learning is a process of knowledge-based learning that transforms the experience into knowledge. The information acquired by Intellectual complexes is divided into knowledge, active experimentation, and creative thinking”* (Kolb, 1984). (Kolb), based on two rectangular forms of learning styles, while Richard Felder, Linda Silverman University students' learning style (Felder & Spurlin, 2005) designed to help teachers to conduct training and activities consistent with all students' needs (2005a, p. 103). Felder and Spurlin each of these dimensions are closely linked to other learning style models, and similarities are common in psychiatric and linguistic studies. Specifically, (Kolb) template, Type Indicator (Myers-Briggs) Detector - MBTI tests have many similar features.

The 2018 Report, learning to Realize Education's Promise, is the first-ever devoted entirely to education. Change requires overcoming technical and political barriers by deploying salient metrics for mobilizing actors and tracking progress, building coalitions for learning, and being adaptive when implementing programs (Filmer et al., 2018).

The ability to learn is possessed by humans, animals, and some machines; there is also evidence for some kind of learning in certain plants (Karban, 2015a). Some learning is immediate, induced by a single event (e.g. being burned by a hot stove), but much skill and knowledge accumulate from repeated experiences. The changes induced by learning often last a lifetime, and it is hard to distinguish learned material that seems to be “lost” from that which cannot be retrieved (Schacter et al., 2011).

Humans learn before birth and continue until death as a consequence of ongoing interactions between people and their environment. Nature and processes involved in learning are studied in many fields, including educational psychology, neuropsychology, experimental psychology, and pedagogy. (Hawes, 1996; Mather, 2017).

Learning may occur consciously or without conscious awareness. Learning that an aversive event can't be avoided nor escaped may result in a condition called learned helplessness (Coffield et al., 2004).

The meaning of the word “learning” in the context of pedagogy is as follows: These include:

1. Learning a science and a skill by oneself or by others.
2. Asking others what you don't know or can't do.
3. Containing the meaning of upbringing (Namjildagva, 2014).

Learning styles

Learning styles refer to a range of competing and contested theories that aim to account for differences in individuals' learning (Klein, 2003). The idea of individualized learning styles became popular in the 1970s (Coffield et al., 2004) and has greatly influenced education despite the criticism that the idea has received from some researchers (Pashler et al., 2008, p. 107). Although there is ample evidence that individuals express preferences for how they prefer to receive information, few studies have found any validity in using learning styles in education (Willingham et al., 2015, p. 267).

Different learning style models or inventories (Table 1) have been created in the past few decades.

Table 1. A Summary of Learning Style Models or Inventories

Model / Inventory	Dimensions
Kolb (1984)	converger, diverger, assimilator, accommodator
Reid (1984)	visual, auditory, kinesthetic, tactile, group, individual
Felder and Silverman (1988)	sensing/intuitive, visual/verbal, inductive/deductive, active/reflective, sequential/global
O'Brien (1990)	visual, auditory, haptic
Fleming and Mills (1992)	visual, aural/auditory, read/write, kinesthetic
Oxford (1993)	visual/auditory/hands-on, extroverted/introverted, intuitive/concrete-sequential, closure-oriented/open, global/analytical
Kinsella (1993)	visual/verbal, visual/nonverbal, auditory, tactile/kinesthetic
Ely (1994)	tolerance of ambiguity, intolerance of ambiguity
Memletics Learning Styles Inventory (2003)	visual, auditory, verbal, physical, logical, social, solitary

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Researcher D.Erdenechluun (2014) in her report “Study to determine the current state of mental development of Mongolian children”: *“During the training, the ability to identify external features by looking at things is better, but the ability to think abstractly and logically is relatively weak is. These results underscore the predominance of ready-made information transmission and memorization techniques and methods, as well as the lack of skills to understand, reason, research, and reason on phenomena ”*(Page 17). This is a clear indication that the learning environment in the classroom does not reflect the nature of real-life activities.

According to G.Erdene-Ochir, a scholar, “Our education is dominated by universal learning technology” (8-116). We agree that it is time to replace innovative technologies that are appropriate for each and every one of us. Swiss psychologist J. Piaget (1966) says that

children go through four stages of cognition. His research has shown that every child goes through the same stages of development, but differs in their level of development. Mongolian folklore says, "Everyone is different, not every horse is perfect," and "Father's son is variegated, and the back tree is long and short." The main reason for the differences in students has been identified by neuroscientists, who have shown that the most important stage in the development of the human brain takes place at an early age (Neilson, 2000). For example, the first Russian psychologist A.R. Luria (1973) tried to explain the human brain from the physiological point of view of the higher mental functions, and then to determine how the human learning process varies depending on it. A combination of traditional and scientific Mongolian methods is essential to determine the characteristics and learning style of Mongolian learners (Namjildagva, 2014).

Quantum learning

The focus of Quantum Learning is to develop effective teaching based on knowing *why* specific QL approaches are effective. Evidence for success is found in research pertaining to the brain's natural neurobiological learning systems (social, emotional, implicit, cognitive, physical and reflective) concepts from De Porter's Quantum Learning System (components of culture and cognition) with Given's synthesis of the Brain's Natural Learning Systems (social, emotional, implicit, cognitive, physical, and reflective). Concepts specific to both are *system* and *learning* while terms unique to Quantum Learning are *quantum* and *atom* (DePorter & Hernacki, 1997).

I am experimenting with life skills, quantum teaching methods, and classroom learning management methods in an integrated manner, and my teaching principle is, first and foremost, to scientifically determine students' learning styles (Namjildagva, 2014).

Classroom management

In 1981 the US National Educational Association reported that 36% of teachers said they would probably not go into teaching if they had to decide again. A major reason was negative student attitudes and discipline (Filmer et al., 2018).

Classroom management can be explained as the actions and directions that teachers use to create a successful learning environment; indeed, having a positive impact on students achieving given learning requirements and goals (Soheili et al., 2015)).

Also, research from Berliner and Brophy & Good show that the time a teacher must take to correct misbehavior caused by poor classroom management skills results in a lower rate of academic engagement in the classroom (Berliner, 1988, p. 319; Brophy & Good, 1986, p. 328). From the student's perspective, effective classroom management involves clear communication of behavioral and academic expectations as well as a cooperative learning environment (Wolfgang & Glickman, 1980).

In today's society, there is a social need to be a teacher-manager. In this sense, the study of personal behavior, the ability to influence, leading that factor is essential for the teacher, so the teacher must master the knowledge, methods and techniques of management science (Namjildagva, 2014).

DATA COLLECTION AND METHOD

In our study, we used a 4-dimensional 44-question model to assess the Felder Index of Learning Styles (ILS) developed by Felder-Silverman (Felder & Silverman, 1988; Felder & Spurlin, 2005b). This study model was developed by North Carolina State University

researchers Barbara Soloman and Dr. Developed by Richard Felder (Felder & Soloman, 2000). The model has 4 dimensions x (Active-Reflective, Sensing-Intuitive, Visual-Verbal, Sequential-Global), each dimension has 11 questions, and they have two possible answers (a, b) that represent the opposite position in the dimension. Scores range from -11 to 11.

In our study 499 students were involved of the three branches (Teacher's school, School of Educational Studies, School of Social and Humanities) of the Mongolian National University of Education (MNUE), who studies with profession of "education studies", "primary education", "art", and "history and society", "linguistics", "education researcher" and "social worker" (see Table 2).

Table 2. General information of students covered

	Schools	Frequency	Percent
Valid	Teacher's school	257	51.5%
	School of Educational Studies	104	20.8%
	School of Social and Humanities	138	27.7%
	Total	499	100.0%

Teachers School students study primary education and art, students of the School of Education study education studies and social work, and students of the School of Social Sciences and Humanities study history, society and linguistics. Of the students surveyed, 81.2% (n = 405) were female and 18.4% (n = 92) were male (missing (2) = 0.4%).

Figure 1 shows the learning styles of the students in the study, grouped into four dimensions. Every point of Active-Reflective, Sensing - Intuitive, Visual - Verbal, Sequential – Global dimensions depended on (a, b) answers between (3a – 3b) is kept in balanced but between (4 – 11) is appeared to be strong.

119 (23.8%)											44(8.8%)	
ACT						336 (67.3%)					REF	
11a	9a	7a	5a	3a	1a	1b	3b	5b	7b	9b	11b	
144 (28.9%)											26(5.2%)	
SEN						329 (65.9%)					INT	
11a	9a	7a	5a	3a	1a	1b	3b	5b	7b	9b	11b	
88 (17.6%)											76(15.2%)	
VIS						335 (67.1%)					VRB	
11a	9a	7a	5a	3a	1a	1b	3b	5b	7b	9b	11b	
81 (16.2%)											38(7.6%)	
SEQ						380 (76.2%)					GLO	
11a	9a	7a	5a	3a	1a	1b	3b	5b	7b	9b	11b	

Figure 1. Integration of students' learning styles into 4 dimensions

Active - Reflective (67.3% (n = 336)), Sensing - Intuitive (65.9% (n = 329)), Visual - Verbal (67.1% (n = 335)), Sequential - Global (76.2% (n = 380)) are balanced on a scale of 1-3 points. Therefore, a combination of training content and methodology in many forms is considered to be accessible to students. The distribution of Visual-Verbal scores in our study was balanced, in contrast to the results of the researchers who used this method (Grzybowski & Demel, 2015; Litzinger et al., 2005). The fact that we did not include students in mathematics, science, and engineering in our sample does not allow us to elaborate on these differences.

8.8% (n = 44) of students with a strong reflexive learning style preferred to study individually. 23.8% (n = 119) of students with a strong predominance of active style prefer to work in groups and do things on their own (Felder & Silverman, 1988).

Sensing patterns were most prevalent among students (28.9%) (n = 144). Teachers need to be aware that they may be extremely difficult to learn in an environment that does not support the environment, as they seek out conceptual theoretical information and meaning during training. However, 5.2% (n = 26) of students with a strong predominance of intuitive learning styles indicate that these students are weak in their ability to search for and apply concepts and theoretical information in their learning. Visual style is strongly dominated by 17.6% (n = 88) and Verbal style is strongly dominated by 15.2% (n = 76), respectively, which necessitates the creation of a learning environment that supports these students. Sequential patterns strongly dominate 16.2% (n = 81) of students, which makes it more effective to distribute meaningful and coherent information to them during training. However, Global-style learners prefer complex information, and 7.6% of our students (n = 38) prefer to receive comprehensive learning content (see **Figure 1**).

Students were grouped by schools, and the average score for each of the 4 LS dimensions was shown with a 95% confidence interval (see **Table 3**).

Table 3. Means and 95% confidence intervals

LS type	Schools	N	Mean	Std. Deviation	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Active(+)/ Reflective(-)	Teacher's school	257	1.25	3.754	.79	1.71
	School of Educational Studies	104	1.37	3.978	.59	2.14
	School of Social and Humanities	138	.93	3.996	.25	1.60
	Total	499	1.18	3.865	.84	1.52
Sensing(+)/ Intuitive(-)	Teacher's school	257	2.00	3.410	1.58	2.42
	School of Educational Studies	104	2.04	3.321	1.39	2.68
	School of Social and Humanities	138	1.83	3.749	1.19	2.46
	Total	499	1.96	3.483	1.65	2.26
Visual(+)/ Verbal(-)	Teacher's school	257	-.26	3.605	-.70	.18
	School of Educational Studies	104	.33	4.323	-.51	1.17
	School of Social and Humanities	138	.39	4.224	-.32	1.10
	Total	499	.04	3.944	-.30	.39
Sequential(+)/ Global(-)	Teacher's school	257	.61	3.383	.20	1.03
	School of Educational Studies	104	.90	3.383	.25	1.56
	School of Social and Humanities	138	.74	3.065	.22	1.25
	Total	499	.71	3.293	.42	1.00

As can be seen from this table (see table 3), the average score of the Sensing-Intuitive learning style of students at the Mongolian Teacher Training University is the highest (mean = 1.96). This suggests that Mongolian students are more interested in clear, pragmatic, systematic information and fact-finding. Researchers O.Myagmar and B.Tuya (2015) conducted a study on the intellectual development of Mongolian students aged 11-18 using D. Wexler's methodology. confirms this result of our study.

The average Vis-Ver learning style score of students in 3 schools was the lowest (mean = 0.04). Among them, there is an average (mean = -0.26) of the students of the Teachers' Training College, who study in a more verbal way than in a visual way. In other words, it is easier for teachers to understand and explain the content and information of the training.

The average score of the Seq-Glo learning style (mean = 0.71) indicates that students' ability to think logically and learn in general is somewhat weak. According to D.Erdenechuluun, who studied the level of intellectual development of Mongolian children by J.Raven's test, "Mongolian children do not develop the ability to compare many mental actions, such as discovering, cultivating, and making abstract mental judgments." was found.

Students in the School of Education studies have the highest Active-Reflective learning style (mean = 1.37), while students in the School of Humanities and Social Sciences have the lowest (mean = 0.93). Active learners do not learn much when they are required to be inactive, and reflexive learners do not learn much when they are not given the opportunity to think about the information they are presenting (Felder & Silverman, 1988).

However, the results of a study of engineering students using this method show that the Visual-Verbal style has the highest average (Felder & Spurlin, 2005b; Grzybowski & Demel, 2015; Litzinger et al., 2005; Zywno, 2003). is. This is probably due to the fact that the majors of the students in our sample are different from those of engineers.

Therefore, it is important for teachers to study their students' learning styles and plan and implement teaching methods in accordance with them, which will have a positive impact on learning outcomes.

Table 4. Means, Std. Dev and ANOVA results for comparisons between female and male students in ILS scores

	N	Act(+)/Ref(-)		Sen(+)/Int(-)		Vis(+)/Ver(-)		Seq(+)/Glo(-)	
		Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Female	405	1.13	3.841	1.99	3.556	-.02	3.947	.64	3.296
Male	92	1.52	3.921	1.78	3.193	.30	3.938	.98	3.308
Total	497	1.20	3.855	1.95	3.490	.04	3.943	.71	3.297
ANOVA		<i>p</i> = 0.378		<i>p</i> = 0.603		<i>p</i> = 0.474		<i>p</i> = 0.381	

For answers to the ILS questionnaire, Means, Std., Asked whether there were gender differences between male and female students. Analyzed by Dev and ANOVA methods. Table 4 shows that there is no gender difference in the learning styles of teacher training students. This is similar to some of the results of a study of students studying linguistics (Wang & Mendori, 2015).

Table 5. Means, Std. Dev and ANOVA results for comparisons between schools in ILS scores

School		Act(+)/Ref(-)	Sen(+)/Int(-)	Vis(+)/Ver(-)	Seq(+)/Glo(-)
Teacher's school	Mean	1.25	2.00	-.26	.61
	N	257	257	257	257
	Std. Deviation	3.754	3.410	3.605	3.383
School of Educational Studies	Mean	1.37	2.04	.33	.90
	N	104	104	104	104
	Std. Deviation	3.978	3.321	4.323	3.383
School of Social and Humanities	Mean	.93	1.83	.39	.74
	N	138	138	138	138
	Std. Deviation	3.996	3.749	4.224	3.065
ANOVA		$F = 0.316$ $p = 0.729$	$F = 0.479$ $p = 0.620$	$F = 4.659$ $p = 0.010$	$F = 0.803$ $p = 0.449$

In the ANOVA analysis in Table 5, there was a statistically significant difference between the Visual-Verbal patterns at the 0.01 level between the schools. Visual-Verbal learning averages (mean = 0.39) for students in the School of Humanities and Social Sciences are higher than in the other two schools. In other words, students majoring in linguistics are more likely to learn Visual-Verbal.

There are no statistically significant differences for other styles. The fact that we did not include students in mathematics, science, and engineering in our sample does not allow us to elaborate on these differences. This is because our research samples, or students from these schools, are mostly in the social sciences, so the difference may not have been noticeable.

Table 6. Means, Std. Dev and ANOVA results for comparisons between grades in ILS scores

Grade		Act/Ref	Sen/Int	Vis/Ver	Seq/Glo
1	Mean	1.02	2.08	-.60	.78
	Std. Deviation	3.688	3.493	3.666	3.300
2	Mean	1.24	1.69	.18	.93
	Std. Deviation	3.780	3.585	3.941	3.405
3	Mean	1.16	1.99	.35	.54
	Std. Deviation	4.192	3.509	4.275	3.161
4	Mean	1.79	2.37	1.26	.11
	Std. Deviation	3.821	2.945	3.546	3.311
ANOVA		$F = 0.420$ $p = 0.739$	$F = 0.545$ $p = 0.652$	$F = 3.123$ $p = 0.026$	$F = 0.807$ $p = 0.491$

Also see if there is a difference in the course of study Means, Std. Analyzed by Dev and ANOVA (see Table 6). There was also a statistically significant difference between the grades at the Visual-Verbal style p (sig) = 0.026 and $p < 0.05$. There are no statistically significant differences for other styles. Depending on the course, students' Visual-Verbal learning styles vary. 4th year students outperform other students (mean = 1.26), while freshmen have the lowest (mean = -0.60). In other words, as students progress through the

grades, their learning style becomes better. This means that the ability to see and read information is increasing rather than hearing. This is due to the fact that students learn more and more as they progress through the grades.

Table 7. Means, Std. Dev results for comparisons between professions in ILS scores

Profession		Act/Ref	Sen/Int	Vis/Ver	Seq/Glo
Foreign Language teacher	Mean	1.43	1.70	-.65	-.04
	Std. Deviation	3.355	4.247	4.292	2.163
Elementary teacher	Mean	1.07	2.10	-.19	.54
	Std. Deviation	3.746	3.342	3.638	3.447
Educational researcher	Mean	1.43	2.25	.36	.68
	Std. Deviation	4.120	3.204	4.317	3.512
Mongolian Language teacher	Mean	.62	1.62	.51	.73
	Std. Deviation	3.898	3.715	4.250	3.316
Musical teacher	Mean	2.11	1.49	-.69	.91
	Std. Deviation	3.755	3.745	3.410	3.103
Social worker	Mean	1.22	1.00	1.78	.89
	Std. Deviation	4.110	2.910	3.439	2.220
History teacher	Mean	1.19	2.29	.86	1.24
	Std. Deviation	4.457	3.529	4.153	2.970
Psychologist	Mean	1.33	2.27	-.60	1.33
	Std. Deviation	3.754	3.732	4.680	3.754
Total	Mean	1.18	1.96	.04	.71
	Std. Deviation	3.865	3.483	3.944	3.293

In terms of specialization (see table 7), students of music teacher profession are more active learners (mean = 2.11) and more language learners (mean = -0.69). The social worker class has a higher visual learning style (mean = 1.78). Psychological professional students have a better way of studying reasoning (mean = 1.33). Students in History, Education, and Psychology are more likely to be Sen / Int learners who are interested in factual information and seek meaning.

CONCLUSION

In our study, we aimed to define the learning style of aspiring students according to globally accepted standard criteria, and based on this, to design teaching methods that fit the learning style. Numerous studies by Mongolian researchers have shown that global education policy, the Mongolian government's education policy, and the Education Law provide for the use of teaching and learning methods that are appropriate to the individual's learning style.

Since there are no strict criteria for detecting students' learning patterns in Mongolia, it is important that we use the Field Solomon test to determine the learning patterns of students in the teaching profession for the first time, so that other teachers and researchers can conduct research using this method.

On the other hand, our study is unique in that it implements the Mongolian government's legal provisions on education and meets the needs of society. By identifying and identifying students' learning patterns through internationally recognized test indicators, it is possible to successfully implement strategies that can effectively influence each student's learning outcomes, regardless of which teaching method is used.

Our research shows that the similarities and differences in the learning styles of Mongolian students may be related to Mongolian personality traits, feelings, cognition, and thinking.

This study was conducted with the purpose to investigate Mongolian university student learning styles, if lecturers will be used the outcome of the survey. Our survey found that everyone has a different learning style. We believe that student's learning will improve if lecturers will use teaching methods according to the learners learning style. Thus our study suggests that there is a need to describe student's learning style before next training.

Also reasons for not describing student's learning styles suggests that there is a need to inform lecturers about the opportunity of using learning styles to the training. We aware of usefulness of learning styles as majority of us suggested that it is better to describe student learning styles as earlier as possible. Thus our survey suggests that it is better to connect early the training according to the learning styles in the grade of secondary school.

The usefulness of student learning styles depends on the research method. Therefore, our survey suggests that it is essential to use the research method to meet international standard.

Furthermore, the usefulness of using learning styles to the training as a result increases the learning outcome. Thus our survey suggests that the study of student' learning style need to be clearly.

Every student study differently. It is important for educators to understand the differences in their students' learning styles so that they can implement best practice strategies into their daily activities, curriculum and assessments, and this classification suggests that the teacher is a researcher. Therefore, in order to improve usefulness of student' learning styles in the classroom, it is essential for university students to learn successfully.

Based on the results of our previous research, we have developed a Learning trinity model /*Learning style, Management of Teaching and Quantum Learning and Teaching*/ for the use of teaching methods tailored to our students' learning styles. So that we are going to experiment this model in the training.

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