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Fostering Study Skills, Attitudes and Habits among Students Using the Multiple Intelligences Approach

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Abstract

For effective learning to take place study skills, attitude and habits play a crucial role. The theory of multiple intelligences could be used to foster the learning experiences of students and provide proactive learning opportunities, based on the student's unique strengths and interest. Therefore, the present study was undertaken to assess the influence of the multiple intelligences approach on the study skills, attitude and habits of sixth grade students towards academics.

A total of 119 students (both boys and girls) in the age range of 11-13 years were identified for the study, constituting an experimental group (N=56) and a control group (N= 63). The experimental group was exposed to an intervention programme, where a part of the curriculum was introduced using the multiple intelligences approach for an academic year. The results of the pretest - posttest data analysis indicated an improvement in certain areas of the study skills, attitude and habits of students in the experimental group.

Key words: Multiple Intelligences Approach, Study skills, Attitude and Habits

Introduction

School age is a crucial period in the life of an individual. It is during this period that an individual begins to develop a sense of self worth, a positive self -image and builds on his or her self esteem. Most children enter school, eager and excited to learn. Schools' should foster this positive mind-set towards learning and motivate children to reach their full potential and continue learning throughout life. Effective learning can take place, if students are motivated to develop the requisite skills, attitude and habits voluntarily in their own unique ways. In contrast, negative attitudes and anxiety towards studies, can make students feel disengaged, doubt their competence and reduce their potential for learning. If at this period of time, a student is labelled as 'not intelligent' or as a 'slow learner', the damage is done for life. Students, who feel anxious about their ability to cope in any particular subject, may avoid them and may lose important career and life opportunities as a consequence.

The education scenario in India has alarming facts on school drop-outs. Research evidences (Kripalani 2005; Varma 2010) indicate over 50% of children who join up in Class I drop out by Class VIII. Total enrollment in primary classes (Class I to V) was 134.4 million in 2008-09, the latest year for which complete data is made available in the District Information System for Education (DISE) flash statistics, collected by the National University for Educational Planning and Administration (NUEPA). In Classes VI to VIII, the total enrolment had dramatically dropped to 53.4 million. In fact, earlier data from 2006-07, containing class-wise enrolment shows, that with each successive class, students quit in large numbers. By Class V, every third student has dropped out and by Class VIII every second student is no longer attending school. Research evidences (Jayachandran 2007; Chany 2007; Khokhar, Garg and Bharti 2009) also indicate that disinterest and negative attitudes towards studies are some of the common reasons that account for the highest proportion of dropouts in India.

An important approach to motivate students and capture their interest is to focus on their study skills, attitude and habits. Interest-based learning is student-centered and increases the likelihood of students being active participants in the learning process, which in turn could lead to a fall in the school drop-out rate.

Pychyl (2008) states, that 'an individual needs both a "Will" component and a "Skill" component to light a fire for learning. Unfortunately, many educators assume that one or the other of these components – are simply the student's responsibility and overlook the student's lack of motivation to learn'. The theory of multiple intelligences, put forth by Gardner (1983) proposes a major transformation in the learning experience of students. It could provide opportunities for authentic learning, based on the student's needs, strengths and interests and motivate students to be active involved learners. Therefore the present study was undertaken to assess the influence of the multiple intelligences approach on the study skills (skill component), attitude and habits (will component) of sixth grade students.

Objectives

- To elicit information on the dominant areas of intelligences in students.

- To assess the study skills, attitude and habits of students towards academics.
- To design the academic curriculum of VI standard students based on the perspectives of the experiential learning theory, the situated learning theory, the constructivist theory, using the Multiple Intelligences theory as its pivotal framework.
- To introduce the designed curriculum to VI standard students for an academic year.
- To assess the impact of the designed multiple intelligences approach on study skills, attitude and habits of students towards academics.
- To study the gender differences in the study skills, attitude and habits of the experimental and control group samples.

Methodology

The study was carried out in the following VIII phases:

Phase I. Development of appropriate tools for the study:

Three tools were developed (in English) for the study.

Tool -1: Multiple Intelligences Statement-Based Checklist (MISC):

The researchers' developed a Multiple Intelligences Statement-Based Checklist, compatible for the Indian context and suitable for the age group selected for the present study with the following features: The checklist consisted of 80 statements covering Howard Gardner's eight areas of intelligences, with 10 statements per intelligence area. The dominant and weaker intelligences of the students were assessed by categorising their responses into weak, fairly strong, strong and very strong intelligences for each of the eight intelligence areas.

Content Validation: 25 statements were identified initially, for each of the eight intelligences areas and given to subject experts in the field of Psychology, Human Development and Education for scrutiny. Based on their inputs, 10 statements for each intelligence area were shortlisted for the present study.

Reliability: Split-half test of reliability was applied to test the reliability of the tool. The reliability of the tool was found to be 0.74.

Tool-2: The Activity Oriented Tool (AOT):

For accurate classification and cross-verification of the Multiple Intelligences Statement-based Checklist, a pictorial/ activity-oriented version with reference to the Multiple Intelligences Statement-based Checklist was developed.

Tool-3: Study Skills, Attitude and Habits Checklist:

This checklist was designed to be administered for pretest - posttest analysis.

Extensive review on learner characteristics, learning styles and curricular skills were carried out and a comprehensive checklist was developed to elicit information on the study skills, attitude and habits of students towards academics. The Indian context and the age range were considered, while developing the tool.

Reliability: The reliability of the tool was found to be 0.71 after applying the split-half test of reliability.

Content Validation: Through extensive review of related literature and discussion with subject experts in the field, 101 statements were identified, that could be used in the scale to be developed. The identified statements were given to subject experts in the field of Psychology, Human Development and Education. The feedback obtained from these experts lead to the finalization of 54 statements for assessing study skills, attitude and habits towards academics and were further classified into

Study Skills (25 statements) to elicit information on

- Learning Skills (7 statements)
- Time Management Skills (4 statements)
- Exam/ Test Taking Skills (6 statements)
- Memorizing Skills (related to Multiple Intelligences) (8 statements)

Attitude towards studies (20 statements) to elicit information

- Towards Learning (5 statements)
- Towards Time Management For Homework (2 statements)
- Towards Exams/ Tests (4 statements)
- Towards Subjects (9 statements)

Habits toward studies (9 statements) to elicit information

- Related To Learning (5 statements)
- Related To Time Management (4 statements)

Phase II Identification and selection of schools

A total of 20 schools were surveyed in and around Bangalore city to identify two schools which would be willing to introduce the multiple intelligences approach in their sixth grade curriculum for an academic year. Similarities in the type of schooling offered (syllabi followed, fee structure etc), cooperation of school management and the socio demographic characteristics of the school, were the broad norms for selecting the schools. Two schools were shortlisted for the study namely, The Titan School, Hosur and J.S.S Public School, Bangalore. The two schools were isolated

from each other to avoid spill over effects. The lottery method was adopted to classify the schools into experimental and control schools.

Phase III Sample selection

The selection of the sample was done on a voluntary basis, as the researchers' felt that a voluntary participation would yield more accurate results than a captive participation. Standard VI students from The Titan School were selected for drawing the experimental group samples.

In Erikson's theory of psychosocial development (see Berk 1997), the fourth stage i.e, *Industry vs. Inferiority (6-11 years)*, is when children develop a feeling of competence and belief in their own skills. In the fifth stage i.e, *Identity vs. confusion (12-18 years)*, they explore their independence and develop a sense of self. Therefore the researchers' opined that the age range between the fourth and fifth stage (11 to13 years), would be an ideal representative age group to assess the influence of the multiple intelligences approach on study skills, attitude and habits of students for the present study. It was assumed, that this age group would be ideal to foster competence and a sense of self worth through the multiple intelligences approach, which in turn could lead to better academic performance and a life-long love for learning.

Potential research participants were given sufficient information about the study and consent was obtained from a total of 56 sixth grade students, from Titan school, who agreed to participate in the research study. The control group comprised of 63 sixth grade students, from J.S.S Public school.

Phase IV. Pretest data collection

Pretest data collection was carried out in two stages:

i. The Multiple Intelligences Statement Based Checklist was administered to the respondents from both experimental and control group, to elicit information on their dominant areas of intelligences.
ii. Respondents from both the experimental and control group were administered the Study Skills, Attitude and Habits Checklist, to assess the study skills, attitude and habits of students towards academics.

Phase V Development of modules

A total of 14 modules were designed for the intervention programme, which spanned across 72 sessions. Sessions were designed to be offered thrice a week for approximately 2 hours per session.

Modules were developed using a blend of learning theories, namely,

- **The Experiential learning theory-** to cater to the four types of learners.

- **The Constructivist theory** – to ensure maximum opportunities for active self-learning and hands on experience
- **The Situated-learning theory-** to present knowledge in authentic contexts or settings and foster social interaction and collaboration
- **The Reggio Emilia Approach-** to initiate learning through social interactions, sensory learning experiences and self directed learning and
- **The Multiple Intelligences theory** – as the core framework, to give leverage to the diverse intelligences of the students by allowing them to plan and create their own unique learning strategies through their dominant/ preferred intelligences.

Phase VI. Intervention programme

The experimental group students were exposed to the modules, developed in phase V, for an academic year, i.e., 2009-2010. Each session of the intervention programmme was introduced to the experimental group through a warm-up activity and a brief introduction on the topic. This was followed by, organising students into groups. Topics and duties were then assigned to the groups on the subject introduced for a particular session. Students were directed to discuss and plan activities using any one or more of the eight intelligences, for the assigned topic. They were expected to come up with their own unique activities, props, aids and strategies. Students were given the freedom to exhibit their understanding of the topic through any multiple intelligences areas such as art activities – (painting, posters, collages, puzzles, pottery and puppet skits), team activities- (role-play, organised games, dance, demonstrations, conducting experiments, nature walks, debates, powerpoint presentations), music activities- (singing, composing and playing instruments) etc. The important points about the topic were highlighted during the recap time by the researchers'. Students were cheered and rewarded ocassionally for their efforts, co-operation and team work.

Phase VII Post test data collection

To elicit information on any significant differences in the study skills, attitude and habits between the experimental and control group, the Study Skills, Attitude and Habits checklist was re-administered to the respondents of both groups.

Phase VIII Statistical analysis

Descriptive statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean ± SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance. Student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups Inter group analysis) on metric parameters, and Student t test (two tailed, dependent) has been used to find the significance of study parameters on continuous scale with in each group. Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups.

Hypotheses

The study hypothesised that

- Integrating the **Multiple Intelligences perspective** for designing learner-centric curriculum, will not be effective.

- There will be no significant difference in the **study skills** of students after exposure to curriculum taught using the Multiple Intelligences approach.

- There will be no significant difference in the **attitude** of students **towards academics** after exposure to curriculum taught using the Multiple Intelligences approach.

- There will be no significant difference in **study habits** of students after exposure to curriculum taught using the Multiple Intelligences approach.

- There will be no significant **gender differences** in the study skills, attitude and habits of experimental and control group samples.

Results and discussions

Table 1. Socio-Demographic Data of Respondents

BASIC DATA	Experimental School		Control School	
	No.	%	No.	%
Age in years				
11 years	20	35.8	19	30.2
12 years	35	62.5	39	61.9
13 years	1	1.8	5	7.9
Total	56	100.0	63	100.0
Gender				
Male	35	62.5	33	52.4
Female	21	37.5	30	47.6
Total	56	100.0	63	100.0
Type of family				
Joint	10	17.9	23	36.5
Nuclear	46	82.1	40	63.5
Total	56	100.0	63	100.0
Ordinal position				
1	39	69.6	43	68.3
2	16	28.6	20	31.7
3	1	1.8	0	0.0
Total	56	100.0	63	100.0
No. of siblings (Brother)				
0	35	62.5	37	58.7
1	19	33.9	23	36.5
2	2	3.6	2	3.2

3	0	0.0	1	1.6
Total	56	100.0	63	100.0
No. of siblings (Sister)				
0	30	53.6	43	68.3
1	25	44.6	19	30.2
2	1	1.8	1	1.6
Total	56	100.0	63	100.0
Fathers' Education				
Below SSLC	1	1.8	0	0.0
SSLC	3	5.4	4	6.3
PUC	7	12.5	5	7.9
Diploma	4	7.1	7	11.1
Degree	17	30.4	18	28.6
Post Graduation	12	21.4	7	11.1
PhD	2	3.6	0	0.0
Professional	10	17.9	22	34.9
Total	56	100.0	63	100.0
Mothers' Education				
Below SSLC	2	3.6	1	1.6
SSLC	13	23.2	12	19.0
PUC	12	21.4	6	9.5
Diploma	1	1.8	5	7.9
Degree	18	32.1	21	33.3
Post graduation	9	16.1	8	12.7
Professional	1	1.8	10	15.9
Total	56	100.0	63	100.0
Fathers' Occupation				
Banking	0	0.0	3	4.8
Business	9	16.1	23	36.5
Doctor	0	0.0	1	1.6
Engineering	5	8.9	12	19.0
Inspector	3	5.4	3	4.8
Managerial/Management	7	12.5	15	23.8
Purohit	0	0.0	1	1.6
Teaching	2	3.6	5	7.9
Technician	30	53.6	0	0.0
Total	56	100.0	63	100.0
Mothers' Occupation				
Administration	1	1.8	0	0.0
Banking	0	0.0	4	6.3
Business	0	0.0	1	1.6
Engineering	0	0.0	5	7.9
Home-maker	38	67.9	38	60.3
Managerial	0	0.0	1	1.6
Teaching	11	19.6	14	22.2

Technician	6	10.7	0	0.0
Total	56	100.0	63	100.0

Table 1 shows the socio demographic data of the respondents in both groups. Statistical similarities were established for the following variables. Age distribution (P=0.151); Gender distribution (P=0.266); Type of family (P=0.023)*; Ordinal position (P=0.687); Distribution of Number of siblings (brother) (P=0.969); Distribution of number of siblings (sister) P=0.189; Distribution of fathers' education (P=0.413); Distribution of Mothers' education (P=0.207) and Distribution of fathers' occupation (P<0.001) **.

Table 2. Classification of the Eight Intelligences Areas among Respondents.

MISC	Classification of areas of intelligence			
	Weak	Fairly strong	Strong	Very strong
EXPERIMENTAL (n=56)				
Total	0	1(1.8%)	39(69.6%)	16(28.6%)
Verbal- Linguistic	0 (0%)	6 (10.7%)	38 (67.9%)	12 (21.4%)
Math- Logical	0 (0%)	3 (5.4%)	35 (62.5%)	18 (32.1%)
Visual Spatial	0 (0%)	5 (8.9%)	32 (57.1%)	19 (33.9%)
Bodily Kinaesthetic	0 (0%)	4 (7.1%)	34 (60.7%)	18 (32.1%)
Musical	0 (0%)	9 (16.1%)	34 (60.7%)	13 (23.2%)
Interpersonal	0 (0%)	4 (7.1%)	38 (67.9%)	14 (25%)
Intrapersonal	0 (0%)	2 (3.6%)	38 (67.9%)	16 (28.6%)
Naturalistic	1 (1.8%)	0 (0%)	26 (46.4%)	29 (51.8%)
CONTROL (N=63)				
Total	0	4(6.3%)	52(82.5%)	7(11.1%)
Verbal- Linguistic	2 (3.2%)	12 (19.0%)	41 (65.1%)	8 (12.7%)
Math- Logical	0 (0%)	7 (11.1%)	43 (68.3%)	13 (20.6%)
Visual Spatial	4 (6.3%)	12 (19%)	39 (61.9%)	8 (12.7%)
Bodily Kinaesthetic	0 (0%)	7 (11.1%)	36 (57.1%)	20 (31.7%)
Musical	6 (9.5%)	20 (31.7%)	29 (46%)	8 (12.7%)
Interpersonal	1 (1.6%)	11 (17.5%)	33 (52.4%)	18 (28.6%)
Intrapersonal	1 (1.6%)	7 (11.1%)	36 (57.1%)	19 (30.2%)

Naturalistic	0 (0%)	6 (9.5%)	39 (61.9%)	18 (28.6%)

Table 2, shows the classification of the eight intelligences areas among respondents. The table indicates that the majority of the respondents from both groups were found to have strong to very strong ranges of all eight intelligences. Majority of the experimental group respondents exhibited very strong naturalistic intelligence and strong verbal, interpersonal and intrapersonal intelligences. Majority of the control group respondents exhibited very strong bodily kinaesthetic intelligence and strong math-logical intelligence.

Data presented in this table, leads to the inference that all students possess eight different intelligences at varied levels and therefore can be taught through eight different ways, as suggested by Armstrong (2009). He states that "one of the most remarkable features of the theory of multiple intelligences is how it provides eight different potential pathways to learning. It suggests that lessons can be viewed and presented to students in a wide variety of ways and student's approach to understanding concepts from different angles can be addressed".

Table 3. a. Effectiveness of the intervention programme on the study skills of the respondents

Study Skills	Assessment	Experimental school	Control school	Significance	Effect size
Learning	Pre	9.86±2.22	9.16±2.62	t= 1.558; p=0.122	0.28
	Post	10.49±2.20	9.02±1.85	t= 3.842; p<0.001**	0.72
Time management	Pre	5.09±1.63	4.95±1.59	t= 0.463; p=0.644	0.09
	Post	5.60±1.42	5.32±1.43	t= 1.055; p=0.294	0.20
Exam	Pre	7.45±1.57	7.16±2.02	t= 0.860; p=0.392	0.16
	Post	8.15±1.99	7.82±1.51	t= 0.964; p=0.337	0.19
Memorising	Pre	9.41±3.32	7.78±2.74	t= 2.939; p=0.004**	0.54
	Post	10.51±2.72	8.21±2.79	t= 4.413; p<0.001**	0.83

+ significant at 10% Level, * Significant at 5 % ** Significant at 1%

Table 3.a, indicates the effectiveness of the intervention programme on the study skills of respondents, under the following areas namely, learning skills, time management skills, exam skills and memorizing skills. There was a significant difference noted in the learning skills and memorising skills area between the experimental and control group, when the post test data is considered.
The impact of the intervention programme on study skills of respondents indicate that the intervention programme has had a moderate effect on the learning skills area, a

small effect on the time management skills area, no effect on the exam skills area and a large effect on the memorising skills area.

The small effect noted in the time management skills may be because the multiple intelligences approach, being a new concept, may require more time to be conceptualised and executed in the daily learning routine of students.

The probable reason why there was no effect noted on examination skills could be because as a practice, during exams, students tend to learn by rote, for a short period of time, due to a time constraint, rather than understanding information to retain for long term. Another reason could be, that children predominantly, are trained to learn by rote from their lower grades and thus this method of learning is deeply ingrained in them. Therefore students may require more time to unlearn this method.

However the moderate effect observed in the learning skills area and a large effect observed in memorising skills using the multiple intelligences framework indicate that there is a scope for addressing this dimension of learning to help students perform better.

Table 3. b. Effectiveness of the intervention programme on the attitude of respondents toward academics

Attitude Towards Academics	Assessment	Experimental school	Control school	Significance	Effect size
Learning	Pre	6.09±1.86	6.03±1.71	t= 0.176; p=0.861	0.03
	Post	7.20±1.59	6.86±1.63	t= 1.117; p=0.266	0.21
Time management	Pre	2.13±0.92	2.32±1.04	t= 1.063; p=0.290	0.19
	Post	2.44±0.90	2.21±1.15	t= 1.159; p=0.249	0.22
Exam	Pre	4.68±1.59	4.84±1.66	t= 0.545; p=0.586	0.10
	Post	5.00±1.72	5.49±1.57	t= 1.578; p=0.117	0.30
Subjects	Pre	9.54±3.21	11.54±2.71	t= 3.693; p<0.001**	0.67
	Post	12.16±2.75	12.46±2.61	t= 0.578; p=0.565	0.11

+ significant at 10% Level, * Significant at 5 % ** Significant at 1%

Table 3.b, shows the effectiveness of the intervention programme on the attitude of respondents towards academics, which covers the following areas namely, attitude towards- learning, time management, examination and various academic subjects. There were no significant differences noted in any of the areas of attitude towards academics.

When the impact of the intervention programme, on the attitude towards academics is considered, it is observed that the intervention programme has had a small effect on attitude of students towards learning, time management and examination and no effect on the attitude towards the academic subjects.

The reason for a small effect size could be that, attitudes are formed based on an individual's prior experiences and sets an impression in the psyche of an individual which cannot be undone overnight. The small effect size is an indicator that, if this approach of teaching and learning is carried out, over a long period of time, there is all possibility that a larger effect size can be observed as the preset attitude could slowly be undone and new attitude could be fostered.

Dillihunt (2004) examined how using multiple intelligence techniques as a teaching strategy as opposed to a direct instruction teaching strategy effects third and fifth grade math achievement, student motivation, student task engagement, and teacher efficacy. Results suggested that students' performance on mathematics and the task engagement by students had increased in the multiple intelligences classrooms but student motivation had shown no increase. This result supports the analysis reflected in the table above.

Table 3. c. Effectiveness of the intervention programme on the study habits of respondents in both groups

Study Habits	Assessment	Experimental school	Control school	Significance	Effect size
Learning	Pre	5.91±1.53	5.89±1.55	t= 0.077; p=0.939	0.01
	Post	6.65±1.64	6.14±1.29	t= 1.852; p=0.067+	0.35
Time management	Pre	5.64±1.61	4.79±1.70	t= 2.791; p=0.006**	0.51
	Post	5.80±1.68	5.40±1.68	t= 1.249; p=0.214	0.24

+ significant at 10% Level, * Significant at 5 % ** Significant at 1%

Table 3.c, shows the effectiveness of the intervention programme on the study habits of respondents which covers the following areas namely, habits related to learning and habits related to time management. There was a significant difference noted in the habits related to learning in the post-test data. The impact of the intervention programme on the study habits of respondents indicate that the intervention programme has had a small effect on habits related to learning and time management. The small effect may be contributed by the intervention programme that was carried out for an academic year. It can be assumed, that students are habituated to certain learning methods from their childhood and may require longer durations of time to break off from the older habits and form new ones. Hence students may need longer time and constant reinforcements to inculcate new and positive study habits.

Table 3. d. Effectiveness of the intervention programme on the study skills and attitudes and habits towards academics (Overall)

OVERALL	Assessment	Experimental school	Control school	Significance	Effect size
STUDY SKILL	Pre	31.80±5.29	29.05±6.06	t= 2.629; p=0.010**	0.48
	Post	34.75±6.14	30.37±5.02	t= 4.134; p<0.001**	0.78
ATTITUDE	Pre	22.43±5.46	24.73±4.41	t= 2.541; p=0.012*	0.46
	Post	26.80±4.89	27.02±4.66	t= 0.241; p=0.810	0.05
HABIT	Pre	11.55±2.26	10.68±2.5	t= 1.986; p=0.049*	0.36
	Post	12.45±2.77	11.54±2.29	t= 1.899; p=0.060*	0.36
OVERALL	Pre	84.79±10.53	85.22±13.07	t= 0.199; p=0.843	2.53
	Post	96.75±14.63	89.46±12.18	t= 2.869; p=0.005**	0.55

+ significant at 10% Level, * Significant at 5 % ** Significant at 1%

Table 3.d, shows the overall effectiveness of the intervention programme on the study skills, attitude and habits of respondents. When the impact of the intervention programme is considered collectively, it is observed that the programme has had a moderate effect for study skills, no effect on the attitude towards academics and a small effect on the study habits of the respondents.

It is quite strange, however, to note that the attitude of respondents have shown no effect, since on a normal course, it is assumed that it is easier to change attitudes and more difficult to bring about changes in the skills and habits of an individual.

However, it is interesting to note that, similar results were found in Dillihunt's study (as quoted in table 3. b discussions) and in Koksal and Yel's (2007) experimental study with 10th grade high school students (Experimental N = 25 and Control N = 25) who were enrolled in classes in Ankara Anatolian High School during the 2004-2005 spring semester. They concluded that, the MIT- based instruction has had a statistically significant effect upon the academic success of students and the permanence of teaching process, whereas there was no significant effect of the MIT-based instruction on the attitudes of students towards the course.

Thus it can be inferred, that the intervention programme has had an impact to a certain extent, on the study skills and habits towards academics and no significant impact on the attitude of students towards academics in general. Although the empirical evidences indicate no effect on the attitude of respondents, during the intervention programme, the researchers' observed the respondents exhibiting a positive attitude

and enthusiasm towards learning through the multiple intelligences approach and incorporating these strategies in their daily learning routine.

Table 4. Influence of the intervention programme on the study skills, attitude and habits towards academics among boys and girls in the experimental group.

Dimensions of SAHI	Assessment	Experimental school		Significance
		Boys	Girls	
STUDY SKILL	Pre	31.06±5.04	33.05±5.57	t= 1.375; p=0.175
	Post	34.00±6.68	35.95±5.07	t= 1.148; p=0.258
Learning	Pre	9.86±2.10	9.86±2.46	t= 0.000; p=1.000
	Post	10.18±2.34	11±1.9	t= 1.359; p=0.180
Time management	Pre	4.74±1.56	5.67±1.62	t= 2.114; p=0.039*
	Post	5.38±1.37	5.95±1.47	t= 1.459; p=0.150
Exam	Pre	7.09±1.65	8.05±1.24	t= 2.303; p=0.025*
	Post	8.21±1.89	8.05±2.18	t= 0.285; p=0.777
Memorizing	Pre	9.37±3.04	9.48±3.82	t= 0.113; p=0.910
	Post	10.24±3.18	10.95±1.72	t= 0.949; p=0.347
ATTITUDE towards	Pre	21.57±4.68	23.86±6.42	t= 1.538; p=0.130
	Post	25.65±4.64	28.67±4.79	t= 2.315; p=0.025*
Learning	Pre	6.06±1.68	6.14±2.17	t= 0.165; p=0.869
	Post	6.85±1.65	7.76±1.34	t= 2.123; p=0.038*
Time management	Pre	1.97±0.92	2.38±0.86	t= 1.645; p=0.106
	Post	2.44±0.86	2.43±0.98	t= 0.050; p=0.960
Exam	Pre	4.49±1.29	5±1.97	t= 1.180; p=0.243
	Post	4.91±1.52	5.14±2.03	t= 0.480; p=0.633
Subjects	Pre	9.06±3.03	10.33±3.41	t= 1.456; p=0.151
	Post	11.44±2.86	13.33±2.13	t= 2.612; p=0.012*
HABITS related to	Pre	11.37±2.18	11.86±2.39	t= 0.777; p=0.440
	Post	12.21±2.83	12.86±2.69	t= 0.846; p=0.402
Learning	Pre	5.74±1.44	6.19±1.66	t= 1.062; p=0.293

	Post	6.50±1.85	6.9±1.22	t= 0.890; p=0.377
Time management	Pre	5.63±1.59	5.67±1.68	t= 0.085; p=0.933
	Post	5.71±1.43	5.95±2.06	t= 0.524; p=0.602
OVERALL	Pre	83.86±10.82	86.33±10.11	t= 0.849; p=0.399
	Post	93.09±14.86	102.67±12.42	t= 2.467; p=0.017*

+ significant at 10% Level, * Significant at 5 % ** Significant at 1%

Table 4, indicates the influence of the intervention programme on boys and girls in the experimental group. It can be observed that the intervention has had simliar effects on boys and girls in the study skills and study habits dimensions. There was a significant difference between boys and girls, in the attitude towards subjects and attitude towards academics in general, when the post test data is considered, indicating that the intervention has had an impact on the attitude of girls more than boys.

When the impact on the study skills, attitudes and habits are collectively considered, again it can be noted that the girls are at an advantage when compared to the boys in the experimental group.

This difference could be attributed to the Indian context, where girls are expected to be shy/ timid, introverted, self-conscious and cannot express freely. Also, girls are expected to have an open mind, be flexible to change and fit in to the system.
During the intervention programme, girls and boys were provided with equal opportunities to involve actively in the classroom activities. This could have motivated the girls and brought about a positive attitude in girls since they were given a chance to shed their inhibitions and participate freely.

Validation of hypothesis

- It was hypothesised that integrating the **Multiple Intelligences perspective** for designing learner-centric curriculum for classrooms will not be effective. The feedbacks obtained from students, teachers and parents; at the close of the intervention programme indicated that the multiple intelligences approach was successful. Another indicator was the school adopting the multiple intelligences approach, on a trial basis to teach in all classes.

Sohn's (2004) study supports the present study. The researcher examined how effective the researcher-created methods and instruments are, in fostering the exploration and development of the students personal profile of intelligences within the multiple intelligence (MI) framework, and applying their newly gained insights to help solve novel mathematical problems. Findings suggest that student's self-identified MI profiles assisted them in selecting appropriate strategies to solve mathematical problems. When students were able to choose their own mathematical strategies, a very high percentage of them used strategies that matched their MI profile.

- It was hypothesised that there will be no significant difference in the **study skills attitude and habits** of students after exposure to curriculum taught using Multiple Intelligences approach. However, analysis of the data indicated that there was significant difference noted in certain areas of the study skills, attitude and habits towards academics among respondents. Hence it can be concluded that the intervention programme has improved the study skills, attitude and habits towards academics to a certain extent, in the experimental group respondents.

- It was hypothesised that there will be no significant **gender differences** in the study skills, attitude and habits of the respondents in the experimental group towards academics. Analysis of the data revealed that impact of the intervention programme on the study skills and study habits of respondents were similar among boys and girls in the experimental group. There was a significant difference noted in the attitude towards academics, particularly in the attitude towards subjects.

Conclusion

Today's schools are essentially passive experiences and the curriculum is designed to address a majority of the student population while students with specific learning needs are neglected. There are very less opportunities provided for the students to explore their learning strengths and pursue their own interests in school. The curriculum is content centric and immense emphasis is laid on exam scores leading to intense competition and stress in students. Students resort to rote learning and memorise the concepts they are taught, rather than understanding them. This mechanical way of learning renders students with the lack of motivation to learn.

The intervention programme guided by Gardner's theory of multiple intelligences has influenced the learning process among students. Students were given the opportunity to identify their dominant intelligences using the multiple intelligences framework. They were given the choice to learn in various ways based on their interests and were lent with a chance to exhibit what they have learnt using their learning strengths in creative and meaningful ways. Cooperation was the hallmark of interactions in the intervention programme and participants shared their responsibility to make choices and to participate in the decision-making process about projects and class assignments. They had the freedom to express and voice their opinions regarding a topic or assignment. Participant feedbacks have conveyed that the students enjoyed the myriad opportunities they had to succeed at learning and were motivated to learn using this holistic approach in their future learning.

Therefore the researchers' earnestly appeal to the present educational system to abandon the traditional teaching methods that emphasize on rote learning. They urge schools to provide opportunities for students to learn in tune with their unique minds through the multiple intelligences approach and nurture in students, positive study skills, attitude and habits towards learning.

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