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Abstract within 300 words:

Academic Achievement (AA) portrays the academic outcome that indicates the extent to which students have attained their educational goals. To perform well academically, children must be made aware of not just their intelligence level but also the kind of intelligence that each possesses (Batdi, 2017). Learning Styles (LS) is concerned with how the learners learn rather than what they learn and are believed to be a crucial factor for students' AA (Gokalp, 2013. More so, Yasin, 2020) has stated that a well-thought-out Teaching Pedagogy (TP) is essential in aiding school children to learn more effectively and develop thinking skills of higher order. The study was undertaken with the primary objective of developing predictive models of MI, LS, and TP for the subject-wise AA of school children. The study's secondary objective was to determine the influence of socio-demographic variables on AA, MI, LS, and TP. A descriptive cross-sectional research design was adopted with randomly selected 3026 (studying in schools following the *Samacheer Syllabus* - Uniform syllabus of Tamil Nadu) school children enrolled in 6th, 7th, and 8th standard who constituted the sample and 215 teachers handling classes for these children. Four tools were used to get the necessary data from school children, namely a self-formulated general background questionnaire to get the personal and parental profiles of the school children. Standardized tools, namely the Multiple Intelligence Scale developed by Agarwal & Pal and the Learning Style Inventory developed by Misra, were used to determine student respondents' intelligence and learning patterns, and the Teaching Style Scale developed by Sharma and Saran was used to assess the teaching style of the teacher respondents. Likert Scale to assess subject-wise Academic Achievement (secondary data procured from the student's report cards) of the selected students. The average marks of five major subjects (Language, English, Mathematics, Science, and Social Science) in the five major exams conducted in an academic year were categorized using the commonly used grading system of the schools of Tamil Nadu. The collected data were statistically computed using frequency analysis, t-test, and ANOVA with the independent (socio-demographic variables) and dependent variables (AA, MI, LS, and TP) Hierarchical regression was used with the outcome variable AA in all five subjects and predictor variables as the 9 types of MI, 6 types of LS, and 5 types of TP.

The study revealed that more than 50% of the student respondents had only average and above average levels of AA in almost all the subjects except Language. However, 60 -70% of the respondents were observed to possess average and above-average levels in all domains of MI. In terms of LS, except for FC, all other types of LS were practised only at an average level. The five types of

TP, as practised by the selected teacher respondents, were at average and above-average levels. However, the Delegator type of TP was practised at a higher level (17.6%) than other teaching pedagogy. Among all the socio-demographic factors pertinent to school children, the type of family was found to be an independent factor for AA, MI, and LS. The father's educational status was the next least influencing factor. Teachers' experience and educational qualifications influenced the Formal authority TP and Demonstrator TP, respectively.

The five predictive models of a good fit for AA derived in each subject provided the following clues regarding positive and negative contributors to AA. Logical, Spatial, Naturalistic, and Intrapersonal types of MI positively predict the AA of one or the other subjects. Likewise, in terms of LS, only ER influenced AA on a positive note. Regarding TP, except for the Demonstrator, other styles predict AA. The higher the linguistic and existential MI, the lower the AA. Similarly, VC and FR were negatively contributing to the AA. The demonstrator style of TP negatively influenced all the subjects except Science.

The predictive models also suggested some of the non-contributing factors and cautious factors to AA. Bodily-kinesthetic, Musical, and Interpersonal domains of MI, EC, VR, and FC of LS were the non-contributing factors, as they did not show any relationship with AA. The cautious factors have positive and negative values and to be taken care of for the respective subjects. For example, Formal Authority TP, which positively predicted AA in English, negatively predicted Language, Mathematics, and Science learning. Similarly, Facilitator TP that positively predicted AA in English, Science, and Social Science was found to be negatively influencing Mathematics learning.

Key Words: - Academic Achievement, Multiple Intelligence, Learning Style and Teaching Pedagogy, and Samacheer Kalvi

i) Major objectives :

To formulate predictive models for subject-wise Academic Achievement (AA) of school children enrolled in Samacheer Kalvi (Tamil Nadu Unified System of Education) integrating Multiple Intelligence (MI) and Learning Style (LS) possessed by the students and Teaching Pedagogy (TP) practised by the teachers

Secondary Objectives:

- ✓ To assess the subject-wise AA of the selected student respondents

- ✓ To determine the influence of socio-demographic variables on AA of the selected student respondents
- ✓ To assess the level of MI of the selected student respondents
- ✓ To determine the influence of socio-demographic variables on MI of the selected student respondents
- ✓ To assess the various types of LS of the selected student respondents
- ✓ To determine the influence of socio-demographic variables on the LS of the student respondents
- ✓ To assess the levels of TP of the selected teacher respondents
- ✓ To determine the influence of personal profile on the TP of the selected teacher respondents
- ✓ To formulate a suggestive framework for subject-wise AA with positive and negative predictors in terms of MI and LS of students and TP of teachers

ii) Research Gap:

- ✓ Studies collated are only individual studies correlating one predictor (MI, LS, or TP) with AA. No one study links all the predictors with AA
- ✓ No studies are addressing the formative age group crucial for MI and LS (11 – 15 years)
- ✓ The studies on AA were on overall achievement, but not on subject-wise AA. Though few studies are specific to core subjects like Mathematics and Science learning, the other needed subjects like Language (both regional and foreign language) and Social Science were scant
- ✓ There are no studies related to the Samacheer Kalvi Syllabus (a Unified approach of the state of Tamil Nadu) followed by the schools in Tamil Nadu.

iii) Methodology :

A descriptive cross-sectional research design (with certain inclusion criteria) was used in identifying the schools and the study sample. The study was carried out in Coimbatore which is considered as the educational hub of Tamil Nadu. In the recent past, a good number of schools have mushroomed in Coimbatore. These schools are of three types - government-run schools, schools funded by the government but run by private trusts called as aided schools, and the schools funded entirely by private organizations called as Private schools. To get a fair representation for the research the schools located within 5 kilometers of the heart of the city were shortlisted from the four zones. The schools following Samacheer pattern of syllabus were chosen as it is the only curriculum followed

by both government and private schools in Tamil Nadu. With the set inclusion criteria, 7 to 8 schools were shortlisted in each of the four zones and a total of 30 schools were identified for the study. Out of the 30 schools, 18 schools (4 to 5 schools in each of the four zones) extended their willingness. A total of 3026 school children belonging to 6th, 7th and 8th standard of these 18 schools were the target respondents. The 215 teachers handling classes for these children were also a part of the study.

Regarding the tools used for the study, a total of 4 tools were used to get the necessary data from school children. The first one was the self formulated one to get the personal and parental profile of the school children. The second tool was a standardized MI scale developed by Agarwal & Pal, It encompasses 90 statements in 9 domains of intelligence The response for every statement was scored on a five point Likert Scale. The statements were both positive and negative. The maximum time allowed for MI scale was 20 minutes, and the minimum to maximum of scores for each intelligence ranged from 10 to 90 and the norms of categorizing the intelligence based on the level. The third tool is also a standardized LSI developed by Karuna Shankar Misra, to appraise the learning style of the respondents, as projected. The categorization based on the levels of the score procured. The tool consisted of 42 statements belonging six categories of learning styles, each consisting of seven statements and all of which are positive. The fourth was the Likert Scale to assess the subject wise Academic Achievement, Which procured data from the secondary source in the form of their report cards. The average marks of five major subjects (Lang, English, Mathematics, Science and Social science) in the five major exams (namely Ist Mid Term, Quarterly Exam, IInd Mid Term, Half yearly Exam and IIIrd Mid Term) conducted in an academic year were categorized into seven grades. The Likert Scale of grading system used is based on the commonly used grading system of the schools of Tamil Nadu. The grades and norms used. The third tools used for school teachers. The Ist was a self formulated questionnaire to elicit the personal profile of the teachers in terms of age, gender, educational qualification, professional experience, type of school and subject handled.

Next is the tool used for measuring the Teaching style of the teachers, It is a standardized tool developed by Sapna Sharma & Divya Saran. The various styles categorized in the TSS are – expert style, formal authority, demonstrator, facilitator and delegator. The response for every statement was scored on a five point Likert Scale. The TSS consists of 60 statements and these statements were both positive and negative. The first two domains Expert style and Formal Authority have fifteen statements each whereas the remaining three styles namely Demonstrator, Facilitator and Delegator domains have ten statements each. The minimum to maximum of scores for each style range from 15

to 60 for First two domains and 10 -50 lost three domain. The norms of categorizing the teaching pedagogy based on the level. The conduct of the study, the first step was to establish rapport with the administrators, teachers and children of the schools identified for the study. The next step was collection of primary data and secondary data. The primary data was collected from children and teachers. MI scale and LS inventory were used to collect the data from children. TSS was used to collect the information from the teachers. For secondary data the report cards of children were collected and they were graded based on the likert scale. After the data collection, the sample coded and tabulated in the excel and the data was analysed. Frequency analysis was used to assess the general profile and classification of the respondents based on the levels of AA, MI, LS and TP. t test analysis was used to find the association between AA, MI, LS and TP with gender. One way ANOVA analysis was used to find the association between AA, MI, LS and TP with socio demographic variables having more than two sub groups. Followed by Post hoc analysis was done to identify the relationship between each sub groups. The hierarchical regression analysis was used to determine the predictive capacity of MI, LS and TP on AA there by formulating a suggestive model for AA.

iv) Findings:

The study revealed that more than 50 percent of the children had only average and above average levels of AA in almost all subjects except Language. However, 60 -70% of the respondents were observed to possess average and above-average levels in all domains of MI In terms of LS, except for FC, all other types of LS were practiced only at an average level. The five types of TP as practiced by the selected teachers were in the average and above average levels. However, delegator TP was practiced at a high level (17.6%) when compared to other teaching pedagogy. Among all the socio-demographic factors pertinent to school children, the type of family was found to be an independent factor of AA, MI, and LS. Father's educational status was the next least influencing factor. The experience and the educational qualification of teachers were found to influence the formal authority TP and demonstrator TP respectively.

The five predictive models of a good fit for AA in each of the five subjects provide the following clue in terms of positive and negative contributors to AA. i) Logical, spatial, naturalistic, and intrapersonal types of MI could positively predict the AA of one or the other subjects. Likewise, in terms of LS, only ERinfluences AA on a positive note. In terms of TP except for the demonstrator, other styles predict AA. ii) Higher the linguistic and existential MI, the lower the AA. Similarly, VC

and FR were negatively contributing to the AA. Demonstrator TP negatively influences all subjects except Science.

All the more, the predictive models also suggest some of the non-contributing factors and cautious factors to AA. i) Bodily-kinesthetic, musical, and interpersonal domains of MI and EC, VR, and FC of LS were the non-contributing factors as they did not show any relationship with AA. ii) the cautious factors are factors that have both positive and negative values and are to be taken care of for the respective subjects. Accordingly, Formal Authority TP which was found to positively predict AA in English, was negatively predicting Language, Math, and Science learning. Similarly, facilitator TP that positively predicts AA in English, Science, and Social Science was found to be negatively influencing Math learning

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