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## **SOCIAL MEDIA COMPETENCE OF PROSPECTIVE TEACHERS IN RELATION TO THEIR ACADEMIC SELF-EFFICACY**

**1**

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### **INTRODUCTION**

The era of 21<sup>st</sup> century is considered as an era of technology. Technology plays a very important role in education. A wide range of social network is also a part of this technological bloom. Everyone is connected to one another in this vast network generated by social media. In past days, the communication and free sharing of thoughts among people were restricted by long distance, nationality and religion. But now even these barriers cannot stop the flow of information and knowledge. The new world of social networking allows an instant and free sharing of thoughts. Online social media are created by websites such as Face book, Twitter, WhatsApp etc. social media has a prominent role in education also. Nowadays, media centric education is also an inevitable part of education system. All levels of education system like kindergarten to higher education, corporate education, career learning and formal and non-formal education also held with the help of social media.

Social media is the collective of online communication channels dedicated to community based input, interaction,

content sharing and collaboration. Social media in education refers to the practice of using social media platforms, 'a group of internet based application that build on the ideological and technological foundation of the web 2.0 and that allow the creation and exchange of user generated content'. Social media are computer mediated technologies that facilitate the creation and sharing of information, ideas and other forms of expression via virtual communities and networks. Academic self- efficacy refers to a person's confidence in their ability to organize, execute and regulate performance in order to solve a problem or accomplish a task at a designated level of skill and ability. Self-efficacy is generally regarded as a multi-dimensional construct differentiated across multiple domains of functioning. The construct of self-efficacy helps to explain that the behaviour of individuals is not always accurately predicted from their capability to accomplish a specific task but how a person believes they will perform is often more important.

## NEED AND SIGNIFICANCE OF THE STUDY

Teachers are expected to play multidimensional role such as orientators, initiators, advisors, counsellors, fact finders, fact giving organizers and guidance workers by assembling the achievements of students and by enabling them to develop interest by integrating curricular and co-curricular activities. Social media provides enough opportunities for a teacher to develop these qualities through its various facilities. Teacher should continuously update their knowledge and skills. Modern world social media competent teacher is required in all its sense.

Academic self-efficacy refers to an individual's belief (conviction) that they can successfully achieve at a designated level on an academic task or attain a specific academic goal. Self-efficacy affects every area of human endeavour. Social media are good platform for human interaction. A social media competent teacher must ensure to increase the critical thinking and problem solving ability in their students. It is the responsibility of a social media competent teacher to help her students to use and select proper social media for better information seeking, analyzing, and problem solving and communication platform. So the present study is essential in the current world education field to reveal the relationship between social media competence and academic self-efficacy of prospective teachers.

## OBJECTIVES OF THE STUDY

- To find out the relationship between social media competence and

academic self-efficacy of prospective teachers.

- To find out the relationship between academic self-efficacy and dimensions of social media competence such as,
  - i. Individual media competence
  - ii. Critical media competence
  - iii. Technical competence
  - iv. Educational design competence
  - v. Lifelong learning competence of prospective teachers
- To find out the predictive ability of social media competence on academic self-efficacy of prospective teachers.

## HYPOTHESES OF THE STUDY

1. There exists significant relationship between social media competence and academic self-efficacy of prospective teachers.
2. There exists significant relationship between academic self-efficacy and dimensions of social media competence such as,
  - i. Individual media competence
  - ii. Critical media competence
  - iii. Technical competence
  - iv. Educational design competence
  - v. Lifelong learning competence of prospective teachers
3. There exists predictive ability of social media competence on academic self-efficacy of prospective teachers.

## METHODOLOGY OF THE STUDY

### Method

Survey method was used for the study. The main purpose of the study is to find out the relationship between



social media competence and academic self-efficacy of prospective teachers. By considering the nature of the problem under study, descriptive survey method was used for collecting data.

### Sample

A sample of 370 prospective teachers studying in different B.Ed. colleges under Calicut University was selected using stratified random sampling technique.

### Tools

Two major tools were employed in the study for the collection of data. They are

- Social media competence scale
- Academic self-efficacy rating scale.

### Statistical Techniques

Inferential statistical techniques of Karl Pearson's Product Moment Correlation and Linear Regression analysis were employed for analyzing the data.

### DATA ANALYSIS AND INTERPRETATION OF DATA

1. Analysis of significant relationship between social media competence and academic self-efficacy of prospective teachers

**Table 1: Data and Result of the significant relationship between Social media competence and Academic self-efficacy of prospective teachers**

Variable	N	R	P
Social media competence	370	0.265*	0.001
Academic self-efficacy			

\*Correlation is significant at 0.01 level.

Table 1 indicates that the r value is 0.265 and P value is 0.001. The results reveal that there exist significant positive correlation between social media competence and academic self-efficacy of prospective teachers. The relationship can be

verbally interpreted as positive low correlation.

2. Analysis of significant relationship between academic self-efficacy and dimensions of social media competence of prospective teachers

**Table 2: Data and result of the relationship between academic self-efficacy and dimensions of social media competence of prospective teachers**

(Dimensions of Social media competence)	Academic self-efficacy		
	N	R	P
Individual media competence	370	0.269*	0.000
Critical media competence	370	0.242*	0.000
Technical media competence	370	0.127*	0.000
Educational design competence	370	0.222*	0.000
Lifelong learning competence	370	0.240*	0.000

\*Correlation is significant at 0.01 level

Table 2 indicates that the coefficient of correlation between academic self-efficacy and the dimensions of social media competence of prospective teachers such as individual media competence, critical media competence, technical media competence, educational design competence and lifelong learning competence are 0.269, 0.242, 0.127, 0.222 and 0.240

respectively. The relationship can be verbally interpreted as low correlation. This shows that there exists significant positive relationship between academic self-efficacy and the dimensions of social media competence of prospective teachers.

3. Analysis of predictive ability for social media competence on academic self-efficacy of prospective teachers

**Table 3: Result of simple linear regression analysis to predict academic self-efficacy from social media competence**

Model	r	r <sup>2</sup>	Δ r <sup>2</sup>	Std. error of estimate
1.000	0.265	0.070	0.068	19.5144

Table 3 indicates the value of r shows a low level of prediction. Adjusted r<sup>2</sup> shows 7% of academic self-efficacy can be predicted with social media competence. It denotes that 93% of the variation in academic self-efficacy cannot be explained by social media competence alone. Therefore, there must be other variables that also have an influence upon academic self-efficacy.

competence of prospective teachers (r = 0.269).

### FINDINGS OF THE STUDY

- There exists significant correlation between social media competence and academic self-efficacy of prospective teachers (r = 0.265).
- There exists significant positive relationship between academic self-efficacy and individual media competence of social media competence of prospective teachers (r = 0.242).
- There exists significant positive relationship between academic self-efficacy and technical competence of social media competence of prospective teachers (r = 0.127).
- There exists significant positive relationship between academic self-efficacy and educational design competence of social media competence of prospective teachers (r = 0.222).
- There exists significant positive relationship between academic

self-efficacy and lifelong learning competence of prospective teachers ( $r = 0.240$ ).

- Approximately 7% predictive ability of social media competence on academic self-efficacy of prospective teachers.

## EDUCATIONAL IMPLICATIONS OF THE STUDY

The proper channelization of social media competence is very important in the field of education. That can be possible only through studying how social media competence is related to academic self-efficacy. So the present study is relevant and has the below implications in the educational field.

- Prospective teachers must be made aware of different types of social media competencies
- From this study, it is revealed that social media help to develop academic self-efficacy. Academic self-efficacy will help prospective teachers to succeed in both personal and professional life.
- Prospective teachers should look opportunities for self-discovery and self-assessment.

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- Prospective teachers must be aware of academic self-efficacy skills so that they can adopt them to deal with conflicting situations in daily life.

- Teacher plays an important role in socialization process, most of them are using social media as an assistive technology in their teaching learning process.

## CONCLUSION

The findings of the study indicate that effective utilization of social media is one of the important thing which influences specially in the process of socialization of a human being. Academic self-efficacy and social media competence are positively related to each other. The dramatic effects of social media lead varieties of experiences in the perspectives of the prospective teacher. The modern teacher needs to have some competencies in using social media to provide a better educational environment to the learners. It is also necessary that the teachers' should be academically efficient along with social commitments towards society and educational environment. For the effective teaching learning process, it helps to complement social media competence of teachers along with academic factors.

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## CREATING INQUIRY IN CHEMISTRY CLASSROOM THROUGH EXPLORING CHEMISTRY CONCEPTS AND THEIR LIFE CONNECTIONS

2

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### INTRODUCTION

The history of chemistry as a modern science is generally traced to the late eighteenth and early nineteenth century when chemistry emerged from the shadow of alchemy as Dalton, Lavoisier like chemists spearheaded the development in chemical science from the mantle. In the era of alchemists the life connections of chemical sciences was not decked in contrast to present ICT era. The chemistry we see and feel today is different than the alchemy of 19<sup>th</sup> century. The domain of chemistry has exponentially grown in a manifold, yet it is ever-growing in each passing day. To accelerate the change processes in chemistry, the world needs competent chemists who are to be churned out from the education systems in schools, colleges and universities world over. In spite of all rosy legacies, the hard truth is that the number of students pursuing this pure science discipline is in steady decline and it has to be stopped at any cost for

which the obligation is on educational institutions dealing with chemistry.

According to Abdoolatiff et al (2009), one of the most difficult challenges in the teaching and learning of Chemistry at secondary level involves conveying to students the three dimensional structure and dynamic interactions of atoms and molecules, formula, properties of elements and many more, Because of students' difficulties in visualizing atoms and molecules in three dimensions, many of them are not able to understand the molecular basis for chemical phenomena which forms the very basis of chemistry foundation in colleges and universities.

Further descriptive chemistry which is at the heart of many important processes like analytical applications, the environment, health, consumer products, atmospheric cycles, biological cycles, industrial processes, geochemical cycles, etc. are experiencing declining trend. Descriptive chemistry includes an understanding of the nomenclature

(including popular, historical, and “trivial” names) and properties of the elements and their common compounds, the major sources and uses of common substances, and typical reactions - in particular. Also the descriptive chemistry appears in the development and use of consumer and industrial products, environmental applications, biomedical applications, and all the other aspects that make chemistry such an important part of our daily lives and our economic vitality.

### **RATIONALE OF CONCEPTS AND THEIR LIFE CONNECTIONS**

According to Houten (2008) teaching of descriptive chemistry today is in flux. “Why has descriptive chemistry fallen into disfavor?” Perhaps it is because descriptive chemistry is difficult to “teach” in the traditional manner. Similarly Chun et al. (2010) pointed out that inadequate conceptual understanding is one of the common obstacles that college students often face. This is exacerbated by the lack of incentives and interest which is the stumbling block in chemistry learning.

Moreover students remember and understand abstract chemistry concepts best by creating their own artistic projects Lerman et al, (2009). It has been observed that students better understand and retain longer the scientific information if they are asked to present their understanding in a way in which they feel most competent, comfortable, and talented.

Thus the above discussions reveals that there is lack of understanding of chemistry concepts and their connections with the learner’s interest and life which may be attributed to one or more of the following factors:

Lack of association for learning about concepts related to atomic structure, chemical equilibrium, thermodynamics, IUPAC nomenclature, the periodic law, the uniqueness principle, the diagonal effect, the inert-pair effect; the metal, nonmetal and metalloid regions, acid–base character of oxides, standard reduction potentials and pp–dp bonding are usually built on entirely new grounds. Inability to visualize atoms, orbitals and molecules in three dimensions and the failure to employ formal operations and connections are also present because of the ways the topic has been traditionally taught in classroom situation.

### **THE DIVERSE NATURE OF CHEMISTRY**

A fundamental goal of science is to find invariants: constant relationships that hold between different variables (Simon 1990). Such invariants are perhaps the defining characteristic of quantitative ‘hard’ science: almost all important results in physics (Newton’s law of gravitation, Einstein’s field equations, the mass–energy equivalence, and so on) describe such invariant relationships. In chemistry there exists many more correlation and cross connection between concepts and our life. These connections not only open up our understanding about the natural

world but also provides necessary clue to unearth the chemical relationships between them.

## LITERATURE REVIEW

Jones (2012) studied “Teaching chemistry in context: The effect on student learning and attitudes” with an objective to know, 1) How does teaching chemistry in context affect learning of content? 2) How does teaching chemistry in context affect depth of understanding of content? He found that an issues-based approach to teaching chemistry content enabled students to become grossly involved in the subject and found numerous connections between their lives and the content. Also this was reflected through student’s application of the learned concepts to numerous societal issues. This fascinated the author at the student engagement and connections made by Chemistry in Context experience.

## CHEMISTRY CONCEPTS AND CONNECTIONS (C3) – AN INQUIRY APPROACH

One of the main aims of educational system is to prepare students for living in the contemporary world. Any changes in education are concerned with adjusting it to current conditions and the development. So is the case for chemistry education and research. There is an urgent need to review the way chemistry is being taught in our schools and colleges, so as to make it more relevant to the life of learners.

In recent years constructivist approach of teaching has drawn major attention in teaching learning circles. Constructivist theory has multiple roots going back to Piaget, Ausubel and many more. According to Ausubel, the learning process of students as taking the new knowledge to be learned and assimilating it (i.e. creation of new knowledge by restructuring existing conceptual framework) – incorporating it – into what the learner already knows. Accordingly successful students take possession of knowledge actively, by seeking explicit conceptual linkages between the new concepts they learn and those they already possess (deeply known). The concepts are the most meaningful and are most easily retained in memory; they are the most enduring concepts available because they subsume all the facts.

A C3 approach comprises of concepts organized in series of steps like : No concept => Concept defined => Concept developed => Concept Confirmed => Concept Evaluated. Teacher first gives the question pertaining to a specific chemistry concept, then provides necessary clue to anchor it and then ask students to explain to each other (peer discussion) and teacher finally asks question to confirm the concrete understanding about the concept. In the process students are asked to connect and correlate each concept and to put learned concepts with their connections in their life in a table. This enables the learner to construct his own knowledge by using existing conceptual framework.

Also creating a C3 table is to establish relationships in and between different chemistry concepts that are connected with life which is not possible without self integration process of the learner. This in turn allows the learner to transfer knowledge to novel settings. A constructivist Chemistry Concept and Connection process is illustrated in Fig.1. Rote learning does not help the

child to understand, rather memorize the facts due to which the learner does not develop concrete idea about the concept. However C3 approach helps the learner to organize facts, then reflect on those facts for the exploration of possible correlation and their connects with the life which enables the learner to develop deep concept.

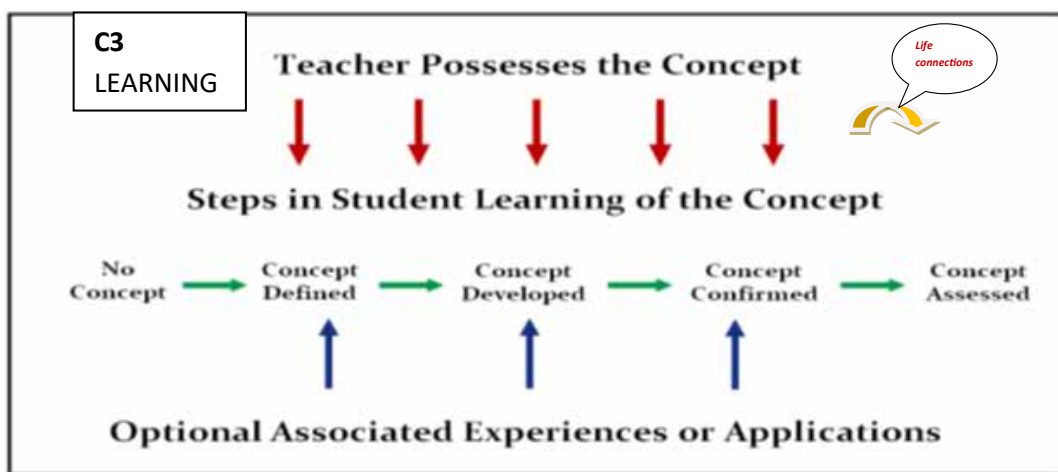


Fig 1. Chemistry Concepts and Connection Process  
 [Source: Jones, J.A. (2012).Teaching chemistry in context]

### THE C3 MODEL

Chemistry occupies a central position in our daily life and it is connected to us in many ways. In our body there are numerous processes going on continually such as: respiration, digestion, producing new cell, filtering and releasing of waste substances from bodies, etc. which are all chemical reactions which help us to survive. We can find several other chemical connections with us all day. For instance, shining teeth to toothpaste, colours to azodyes, the taste of foods

to salt, water for life, clean clothes to detergents, attractive faces to cosmetics, food growth to fertilizers, disease to medicines, good sleep to mosquito repellent, headache to menthol etc., are only to name a few. Many more concept specific connections of chemistry with life are illustrated below as a product of C3 pedagogy. The list is indicative and you may add some of your connections to the list as in Table 1.



**Table 1: C3 Pedagogy Table**

<b>Concepts</b>	<b>Chemistry Connections/ Inquiry Questions</b>
Intermolecular forces of attractions	Why is oil liquid and butter solid at room temperature?
Inorganic compounds	How non living beings are constituted?
Colligative properties	Why does salt melt ice?
Micelles	How does soap clean?
Precipitate	What is soap scum?
Elements	How are planets formed in 'big bang'?
Precipitate	What is hard water?
Oxidation reaction	Why is the statue of liberty blue?
Organic compounds	How living beings are constituted?
Semi permeable membrane, osmosis and diffusion	How does a kidney dialysis machine work?
Myoglobin	Why is beef red while fish is white?
Hemoglobin and Iron	Why is venous blood dark red while arterial blood bright red?
Polymerization of alkenes	How is Teflon made?
Nucleophilic addition elimination	How does penicillin work?
Geometric isomerism	Formation of transfat in cooking oil
DNA Finger printing	Why blood, hair follicles, skin, semen, or even items of clothing of a criminal required?
Second law of thermodynamics	Why is it easy to stay messy while hard to keep neat?
Polymers	How cloth papers are made?
Enzyme specificity	How is it possible that humans cannot digest grass while cows can?
Stereoisomerism	What is the difference between Prilosec and Nexium?
Competitive inhibition	How do sulfonamides fight bacterial infection? (Chun et al, 2010).
Nucleophilic addition-elimination	How is nylon 6-6 made?
Catalytic hydrogenation	Manufacturing of Margarine
Acid catalyzed hydrolysis	How do drug-sniffing dogs detect illegal drugs?
Substrate analogues	How do sulfonamides fight bacterial infection?
Oligosaccharides and antigen-antibody complex	What role do blood types play in blood transfusion?
Structure of lipids	Health benefits of Omega 3 fish oil
Lipid membrane fluidity and temperature	Why deep ocean fish contain more unsaturated fatty acids?
Density	HDL and LDL good and bad cholesterol

## POSSIBLE ADVANTAGES

Most obviously C3 approach enlivens the classroom. In addition it also allows for instant feedback from students about the understanding of the concept. It also allows the teacher to correct misconceptions and to expand on the answer if desired. Through this C3 process, students take an active role in the learning process, instead of only being passive observers.

Furthermore, the C3 tables prepared by students often result in a permanent record, similar to portfolio assessment, which is both useful for assessment and further extension of learned concepts to other concepts. Students may show signs of greater motivation, interest and engagement during the lessons involving use of C3 table as it allows the

learner freedom to connect with self as well as with peers for creating a definite understanding. Also, the goal of C3 is to make chemistry vivid and easy to understand in order to stimulate students' intellectual curiosity, which in turn leads to learning enhancement.

## CONCLUSION

The C3 approach in teaching chemistry is a fascinating one. It avoids what some view as the "drudgery" of lecturing. Instead it provides a lively classroom environment in which learning can take many forms. Therefore, chemistry teachers should make connected effort in this direction to integrate C3 approach in their pedagogical practices involving teaching of chemistry so as to maximize learning in chemistry.

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## CRAFTING AUTHENTIC ASSESSMENTS IN ONLINE CLASSES

**3**

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### INTRODUCTION

Assessments are systematic approaches used by instructors to determine how much or how well the students have learnt the subject; whether it is the end-of-unit tests or end-of-term exams, it crucially evaluates the students' academic performances. So, assessments are ongoing awareness of students' learning and their needs, rather than an occasional event in the program. Rigorous scrutiny along with an understanding of how students learn allow teachers to make valid decisions and judgements on learning. Assessments using empirical data on the knowledge, skill, attitudes, and beliefs actually improve students' learning as well as provides directions for overall development. Therefore, assessments are very essential to the educational process. Without periodic assessments, teachers would never know when to move onto the next subject, or how to help students to understand the concepts in a better way.

### ASSESSMENT

Despite the fact that e-learning is an on-going phenomenon among the higher education institutions, the outbreak of the pandemic situation and consequently the country's lockdown shifted the entire education system into a virtual mode. University faculties and the academicians put their heart and soul in setting up accounts on online classes like Google Classroom and video conferencing platforms like Zoom and Google Meet to get connected with students and engage them with regular academic activities. At the same time, assessments are also prepared in order to identify the benefits of the learning materials and to test whether the objectives are met successfully. The assessment tests are conducted over the internet by using the available web technologies.

The two important types of assessments that are followed in the educational scenario are Formative and Summative Assessments.

Formative assessment congregates information throughout the course; improves teaching, learning and students' performance; it also obtains feedback. Finally, the tests are designed according to the situations. As online education is predominantly a learner-centred approach, assessments should be part of the teaching-learning process, embedded in-class activities and collaborative including the interactions between the learners and also between learners and teachers. It should include a graded quiz, written assignment, online class or unit test and student participation in a discussion forum.

Summative assessment gathers and analyzes students' performance at the end of the course and checks whether the students have achieved the identified goals or objectives. End semester or final exam is the typical example of a summative assessment.

In the prevailing online educational setup, apart from bringing the real world into online learning, conducting a genuine assessment is truly a very crucial challenge for teachers as well as educators. Assessments should be carefully designed such that it not only verifies the acquisition of knowledge but also the ability to apply in professional set-ups. Students may be demanded to reflect on what they have learnt during the course. Case studies, hands-on activities and real-time or application oriented projects could be deemed as true assessments.

In online learning, assessment plays a key role in moving from lower order e-learning to higher order e-learning (Duus, 2009). Lower order e-learning is categorized as content transfer, in which, internet-based communications technology is used for the transfer of knowledge or mode of delivery. Higher order e-learning requires the creation of new knowledge through the creative use of technology. Internet-based communications technology is best employed when students' engagement in knowledge creation is maximised. Some means of assessment during online teaching and learning are listed below.

### **WARMING UP QUESTIONS**

Instead of a vague start to class, a kind of warming up questions or motivational questions leads the students to perform productive tasks. The instructor may provide valuable, trendy information related to the content; may raise questions from the previous days' work.

### **CHECKING OF HOME WORKS**

Enable students to verify their answers for home assignments. The correct ones should be appreciated; the wrong ones should be corrected. Suitable remedial measures that are taken promptly are good means of encouragement to strengthen the level of learning. It is also to be reminded that home assignments should never be a threat to students. It should be a way of communication to represent their level of understanding of the lessons. Moreover, such works should give opportunity for student participation.

## **VERIFYING THE UNDERSTANDINGS**

Since the classes are online, it is very imperative to confirm whether the students have understood what has been taught in the class. In the middle of the classes, students may be asked to wave their hands, showing thumbs up icon if they understood; raise their hands or posting a note in the chat box if they don't understand the instruction. The teacher may also post short questions from the content and students may be asked to respond immediately. This will ensure their presence as well as weigh up the understanding level.

## **SELF-ASSESSMENTS**

When new and complex topics are instructed, it is vital to identify whether the students have understood the concept or not. A kind of self-test or can be put up in between the instruction and they may be encouraged to answer them. Complex content can be broken into small chunks and even be instructed in different methods. A simple quiz or objective type questions can be posted in the classroom or chat box. After the stipulated time, correct responses must be sent to the students. A smiley, an icon of hand claps etc., can be posted by the teacher as an encouraging remark.

## **PEER- EVALUATION**

Peer- evaluation is a process in which students' assigned work, any creative work are reviewed by the fellow students and commented. This will definitely motivate them to clear their doubts

among themselves and also facilitates the teacher to recognize the leadership qualities embedded in them.

## **PRESENTATIONS**

Students can be inspired to present a simple topic in the class for 5-10 minutes. They must be given the freedom of selecting the topics of their own interest. This will reduce the imitation of other students' work. Moreover, the work presented could be solely by the student and can be authenticated.

## **PERSONALISED TESTS**

Set up questions just as an activity during the course and let the students to complete during their free time. Fixing time constraint will build up a sort of pressure in the minds of students. Let the assessment be a part of instruction and do not fix a time or grade or marks. It is very essential to enable the students to understand that the tests are just to identify whether the concept is understood or not.

## **FIELD WORKS**

Recommending some important places to visit either physically or virtually will make the students to be enthusiastic to gain knowledge about the place. Proper guidance and relevant information added to the visit will make the learning about the place a memorable and an enjoyable experience. Making them to write a report on the visit, after all such guidelines will definitely guarantee a personalised and authentic submission of the students.

## CHECK-LISTS OR RUBRICS

Providing rubrics for the assessments will enable the students to do the work in a liberal way as it is more authentic, efficient and transparent way of assessment. Rubrics or checklists also encourage the students to improve their writing skills, presentation skills and creativity.

## OPEN BOOK TESTS

Open book tests and exams are the best choice for summative assessments. The questions should be a bit harder and more of application oriented. Furthermore, the duration of the test should also be minimum or just-enough. This type of tests will rather build up the concentration and focus of the students on the exam rather than copying or browsing the answers.

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These are some of the means to engage the students throughout the online sessions and evaluate the students overall performance.

## CONCLUSION

As this pandemic period has brought phenomenal changes and disruption in the field of higher education, intense focus is been given to the quality and delivery features of education. But it is very indispensable to focus on evaluating the outcomes of teaching. Regular or periodic assessments are very significant to measure the level of learning among students. Accomplishing a genuine or authentic assessment by considering the student-centred learning diverts the academicians' focus from credit or marks based learning to skill or life oriented learning.

## SCIENCE APPRECIATION OF HIGH SCHOOL STUDENTS

4

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### INTRODUCTION

We live in a world of Science and Technology. Science has revolutionized our lifestyle and also brought about tremendous changes in our way of thinking, attitudes, outlook etc. Science has brought about changes in important aspects such as health, communication transportation etc. Science is defined as a process or method adopted in the search for truth (Mangal, 2005) It is an endless process of observation, exploration and acquisition through empirical and conceptual means. Science with the development of accurate technical appliances and invention of improved techniques has become more numerical, quantitative and objective with time (Das, 1990). The effect of science on human life has become so great, hence those who have no understanding of science cannot be considered educated. Because of the rapid advancement of science and technology, Science education is given an importance place in

the school curriculum. Science education is believed to serve as the foundation of technological development and a key factor in economic growth.

### NEED AND SIGNIFICANCE OF THE STUDY

Development of appreciation of science is one of the objectives of teaching science. "Appreciation of science" is defined as recognising the value or excellence of science and therefore choosing the scientific explanation between the clashing worldviews in question (Mugaloglu, 2014). Oxford English dictionary (2010) defines Science Appreciation as recognizing the value or excellence of science. Science appreciation has been operationally defined as the level to which one recognizes the importance of science and the level to which one values and respects scientific research and those who hold authoritative positions in the fields of science (Hcllmuth, 2014).

Science education must provide the means and opportunities to enhance the students' creative expression and capacity for science appreciation. Providing science education to learners with learning experiences in relevant situations beyond the four walls of the classroom can give them idea of the context of the concept being transacted along with a sense of environmental and scientific appreciation. This promotes learners creativity, participation, appreciation and interest in science classroom, which help them to shift away from the rote memorization and have a feel and appreciation of science. Experiences of the learners can be used in the teaching-learning of science to provide them first-hand experience and to develop a sense of appreciation of science.

When students engage in the practices of science, they develop a better appreciation for how scientific knowledge is produced. Students enjoy working together with their peers with some freedom of action. Encouraging them to observe, investigate and think critically on a laboratory activity can facilitate them to construct some abstract concepts and principles of science, to awaken curiosity about the world around them and to gain a feel and appreciation of science. The present study has been undertaken to find out the level of science appreciation among high school students.

## **OBJECTIVES OF THE STUDY**

1. To study the level of science appreciation of high school students.
2. To find out whether there is any significant difference in the mean scores of science appreciation of high school students with respect to the background variables gender, locality and type of management of the school.

## **HYPOTHESES**

1. There will be significant difference in the mean scores of science appreciation of male and female high school students.
2. There will be significant difference in the mean scores of science appreciation of rural and urban high school students.
3. There will be significant difference in the mean scores of science appreciation of high school students studying in government, aided and self-financing schools.

## **METHODOLOGY**

The normative survey method was adopted for conducting the present study. The sample consisted of 200 high school students studying in different schools of Kanyakumari district. The tool used for the collection of data was science appreciation scale (2017) constructed and validated by the investigators. The collected data were analysed by using the statistical techniques such as percentage, arithmetic mean, standard deviation and t-test.



## RESULT AND DISCUSSION

**Table 1: Percentage wise distribution of sample according to different levels of Science appreciation**

Science Appreciation	Count	Percent
Low	25	12.50
Medium	146	73.00
High	29	14.50
<b>Total</b>	<b>200</b>	<b>100.00</b>

From the above table it is seen that the percentage of samples according to low, medium and high level of science appreciation were 12.5%, 73% and 14.5% respectively. This indicates that the majority of high school students have medium level of science appreciation.

**Table 2: Comparison of science appreciation based on Gender**

Gender	Mean	SD	N	t	p	Level of significance
Male	122.84	21.05	91	2.223	0.027	Significant at 0.05 level
Female	116.75	16.95	109			

From Table 2 it is seen that the obtained t-value ( $t=2.223$ ) is significant at 0.05 level. This result indicates that there is significant difference between the male and female high school students in their science appreciation.

**Table 3: Comparison of science appreciation based on Locality**

Locality	Mean	SD	N	t	p	Level of significance
Rural	116.1	18.74	108	2.783	0.006	Significant at 0.01 level
Urban	123.53	18.88	92			

From Table 3 it is seen that the obtained t-value ( $t=2.783$ ) is significant at 0.01 level. This result indicates that there is significant difference between the rural and urban students in their science appreciation.

**Table 4: Comparison of science appreciation based on type of Management of School**

Type of Management	Mean	SD	Source	Sum of squares	df	Mean square	F	P	Level of significance
Government	119.33	21.21	Between GP	81.31	2	40.66	0.110	0.896	Not significant at any level
Aided	119.99	19.61	Within GP	72646.61	197	368.76			
Self-financing	118.19	12.49	Total	72727.92	199				

From Table 4 it is seen that the obtained F-value ( $F=0.110$ ) is not significant at any level. This result indicates that, there is no significant difference in the mean scores of science appreciation of high school students studying in government, aided and self-financing schools. So it can be concluded that the type of school management has no influence on science appreciation of high school students.

### FINDINGS

- Majority of the high school students have medium level of science appreciation.
- There exists significant difference between the male and female high school students in their science appreciation.
- There exists significant difference between the rural and urban high school students in their science appreciation.
- There exists no significant difference between the high school students

studying in government, aided and self-financing schools in their science appreciation.

### CONCLUSION

The study revealed that, the majority of high school students have medium level of science appreciation. It was also found that locality and gender have influence on science appreciation of high school students but, type of school management has no influence on science appreciation of high school students. Since the high school students have only medium level of science appreciation, the teachers should take necessary steps to develop science appreciation among students. Teacher should make the students conscious of the contribution of science for the welfare of mankind. The adventures of scientists in exploring truth should be explained by the teacher, so as to enable the students to appreciate the contribution of scientists. For achieving the aims of teaching science, Science appreciation must be developed among the students.

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## **GENDER DIFFERENCE IN LEARNING STYLE PREFERENCES AMONG SECONDARY SCHOOL STUDENTS**

**5**

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### **INTRODUCTION**

Learning style is a condition under which learners most efficiently and effectively perceives process, store and recall what they are attempting to learn. Student's learning style is differing from one another, and their academic performance closely connected with their learning style preference. "Learning Style is a general tendency to adopt similar set of strategies consistently across different tasks and settings" (Eysenck, 1994). Students may vary in their Learning Styles, and it may based on their character, gender, family background and condition so on. Learning styles involve educating methods particular to an individual to learn best. The idea of learning style is originated in 1970s and acquired enormous popularity.

### **NEED AND SIGNIFICANCE OF THE STUDY**

Today the world is undergoing a change every second. Knowing a student's learning style is one of the most valuable

pieces of information. Every student has a unique type of learning style by which she/he learns best. Students differ in every aspect of their learning styles (Carthy, J.H, 1993). Everyone learn in different manner. In addition, students study differently; what works well for one student may not be beneficial or favourable to another. Learning Style is "the way individuals concentrate on, absorb and retain new or difficult materials or skills" (Rita Dunn & Kenneth Dunn 1992). Learning styles are personal way in which individual process information and the courts of learning new concepts and principles. Learning styles differ from individual to individual. For the same individual they differ from the subject to subject. Therefore the study is relevant, which deals on the gender differences of Learning Style among secondary school students.

### **STATEMENT OF THE PROBLEM**

Gender Difference in Learning Style Preferences among Secondary School Students

## REVIEW OF THE LITERATURE

Upon reviewing the literature on learning styles, the intense rate and growing interest is recognized (Coffield et al. 2004). Lada Kaliska (2013) conducted a study on “Felder’s Learning Style Concept and its Index of Learning Style Questionnaire in the Slovak Conditions”. The statistical analysis of the present study proved not sufficiently significant correlations in the Slovak conditions. Mathews (1995) examined the learning style of post-secondary students in selected institutions throughout South Carolina. The sample included over 200 college students’ preferred social and conceptual style of learning to other style. Firoz (2010) conducted a study on “Learning Style preference and educational commitment of Tribal Students in Secondary Schools of Malappuram District”. The present study was conducted in descriptive method. The study revealed that the emotional component of learning style is highly preferred than other components such as environmental, physical, and social by all students. It suggested that consider the individual difference of the pupils in their learning styles. The audio-visual elements can best be satisfied using audio- visual aids in the classes.

Since 2016 there has been an increasing interest in the studies related to Learning Style. Richard G. Medlin (2010) investigated Learning Style and Academic Achievement in Home schooled Children. Rani (2016) examined relationship of Perceptual Learning Styles

and Academic Achievement among High School Students. Yazıcı (2017) revealed that, competitive and cooperative learning styles had positive, low-level and significant relationship with the TAS’ emotionality sub dimension, and the same relationship was observed between the competitive learning style and the worry sub-dimension. The relationship of gender and class level with learning styles and test anxiety was also investigated in this study.

## OBJECTIVE OF THE STUDY

To find out the significant difference in learning styles among secondary school students based on gender.

## HYPOTHESIS

There exists significant difference in ‘Learning Style’ among secondary school students based on gender.

## METHOD ADOPTED

The present study adopted normative survey method.

## SAMPLE

The sample consisted of 492 secondary school students of Palakkad district. The sample was drawn by using purposive random sampling technique.

## TOOL USED

For collecting relevant data concerning the study, following tool was used. **Learning Style Rating Scale** developed by investigator with supervising teacher.

## STATISTICAL TECHNIQUES EMPLOYED

Mean, Standard deviation and 't' values were calculated to compare boys and girls on the variable of Learning Style.

## DELIMITATIONS

The present study is delimited in terms of sample size, i.e. only 492.

The sample of the study is confined to only 4 schools of Palakkad district.

The study is confined to 9<sup>th</sup> Standard Students only.

## ANALYSIS AND INTERPRETATION

The main purpose of this study was to find whether there existed any difference between boys and girls on the five dimensions of learning style preference i.e., Physiological, Environmental, Sociological, Emotional and Psychological for which 't' values were calculated. The results are presented vide Table 1.

**Table 1: Comparison of boys and girls in Learning Style preferences.**

Dimensions	Gender	N	Mean	Std. Deviation
Environmental	Female	255	12.07	2.84
	Male	237	11.89	2.95
Psychological	Female	255	12.85	3.15
	Male	237	12.77	3.25
Sociological	Female	255	34.65	6.18
	Male	237	34.57	6.28
Emotional	Female	255	24.91	5.22
	Male	237	24.58	5.18
Physiological	Female	255	47.07	8.31
	Male	237	46.63	8.74

Table 1 reveals that the mean scores of the female secondary school students of dimensions Environmental, Psychological, Sociological, Emotional and Physiological are 12.07, 12.85, 34.65, 24.91, and 47.07, respectively. And mean scores of male students are 11.89, 12.77, 34.57, 24.58, and 46.63 respectively. Standard deviation of the male students is 2.84, 3.15, 6.18, 5.22, 5.18, and 8.31 respectively. And standard deviation of the male secondary school students is 2.95, 3.25, 6.28, 5.18, and 8.74 respectively.

Comparison of mean scores of Learning Styles among Secondary School Students on the basis of Gender.

For identifying whether there exists any significant differences in the mean score of Learning Style among Secondary School Students with respect to the Gender, the scores of the samples are analyzed. The obtained scores are tabulated and compared for the significant difference in means. The results are explained under the following heading.

Significance of difference in the scores of Learning Styles of female and male students for the total Sample.

To find out whether there exist any significant difference in the mean score of

Learning Styles among Secondary School Students on the basis of gender, test of significance of difference (t-test) was employed. The results of the statistical analysis are presented in the Table 2.

**Table 2: Test of significances of Difference in the mean scores of Learning Styles of female and male Secondary School Students.**

	<b>Gender</b>	<b>N</b>	<b>M</b>	<b>SD</b>	<i>t'</i>	<i>p</i>
Learning Style	Female	255	133.98	20.97	3.44	.001
	Male	237	127.86	18.28	3.44	2.58

Table 2 reveals that the mean and standard deviation of the female secondary school Students are 133.98, 20.97 respectively. Male Secondary School Students obtained 127.86 as the mean score and 18.28 as the standard deviations. The t-value is 3.44, which is greater than the table value 2.58 at 0.01 level of significance which means that there exists significant difference between females and males students in the score of Learning Styles.

Hence the hypothesis stating that there exists a significant difference between female and male students in their Learning Style is accepted.

## DISCUSSION

From the results it is clear that there exist significant difference in the mean score of Learning Styles among females and males. This result shows that there exists gender difference in the Learning Styles among Secondary School Students.

## FINDINGS OF THE STUDY

The hypothesis was tested using the test of significance of difference between

means. From the results it is clear that there exist significant difference in the mean score of Learning Style Preferences among females and males. It means there exists gender difference in Learning Styles among Secondary School Students.

## CONCLUSION

The study revealed that Learning Styles were studied in relation to Academic Achievement among primary, secondary, senior secondary, and higher education. Different measures of learning styles were used in these studies. Studies were conducted on the interaction effects of learning styles with variables like learning modalities, teaching styles, emotional intelligence, achievement motivation, self-efficacy, etc. on the academic achievement of students. The research reviews on learning style, Academic Achievement, and Achievement in Social Science have paved the way for the study on "Relationship between Learning Styles and Academic Achievement in Social Science among Secondary School Students". Individual students have particular strengths and

weaknesses which can be built upon and enhanced through effective instruction. The findings indicate that majority of the students preferring physiological learning styles. The least preferred learning style is the environmental learning style. And in the present study, the investigator found that there exist significant differences in learning style preference among male and female students.

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