Impact of Learning ICT as a Subject on Secondary School Students' Self-Regulation

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ABSTRACT

Today technology is an inherent part of our lives. All the organizations have identified the importance of Information and Communication Technology (ICT). ICT playsan important role in improvement of educational sector too.ICT helps us in getting information from all over the world. It helps us to bring the world under one roof. Thus the students in the school need to be trained in ICT and its use. With this in view Government of Maharashtra in India introduced ICT as a subject for Std. IX students of Secondary School Certificate (SSC) Board in aided as well as unaided schools. This study deals with the impact of this newly introduced ICTsubject on Std. IX students' self-regulation and its seven dimensions. It is an outcome evaluation study. 1041 students from 21 SSC Board schools from Greater Mumbai were the respondents. Comparison of self-regulation of students from different type of schools indicates that unaided school students are better in their self-regulation.

Keywords: ICT subject, self-regulation, evaluation study, types of school.

Today technology is an inherent part of our lives. All the organizations have identified the importance of Information and Communication Technology (ICT). ICT play important role in improvement of educational sector too. Today education is influenced by the technological advances in terms ofinformation and communication technologies. In recent years there has been widespread interest in the implementation of ICT in schools.

With the advances in technology and motivation and incentives

from the Government to train and educate the students in use of computers State Level Curriculum Committee of Maharashtra State Council of Education Research and Training (MSCERT) has introduced Information Communication Technology (ICT) as a compulsory subject for Standard IX and X in the Secondary School Certificate(SSC) Board schools. SSC is the educational board which follows the State Board curriculum. These are the State Boards run by all the respective states of India.

Accordingly, the ICT subject is offered by all schools for Std. IX and X in Maharashtrawhich are following the State Board curriculum. It is offered by aided as well as unaided schools. Thisis an innovation for the state board curriculum, first time started for Std. IX and X. For this purpose teachers were trained. In this program students are learning about the theoretical and practical concepts of ICT.The concepts considered in ICT subject were Microsoft Word, Excel, Power-point, Introduction

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to Internet, ICT in teaching of languages, social sciences, arts and using media.

One of the advantages of becoming ICT proficient isbecoming capable of using and applying computer technology in learning and subsequently in other situations too. It is also hoped that proficiency in the use of ICT will create greater discipline and help students in regulating themselves and developing confidence in them.In order to achieve anything we need to plan and organize our actions. Here comes the relevance of self-regulation.

According to Dr. Ponitz (2009), **self-regulation** is the ability to control and direct one's own feelings, thoughts, and actions. While the ability to self-regulate has long been considered an essential part of a child's healthy emotional development, self-regulation is increasingly being seen as a good predictor of a child's academic success. McClelland (2009) says"Self-regulation helps children succeed in classroom contexts". The children who can successfully navigate these learning environments have better relationships with their teachers, are more liked by their classmates, and do better academically. They are also more motivated to achieve because of these skills. Both Ponitz and McClelland (2009) believe that parents and teachers play a crucial role in the development of their children's self-regulation. "Parents and teachers are critically important guides and models for children as they learn how to control themselves".

The government is of the opinion that students will become confident after studying this new course in ICT. However, few questions arise. Is there any impact of this course on self-regulation of students? Is the ICT subject enhancing self-regulation of students belonging to different type of schools? The investigator decided to conduct a research study on Std. IX students.

After reviewing the relevantliterature the researcher observed that no evaluative study was done on the newly introduced course. Therefore there was a need to conduct a study of this kind.

STATEMENT OF THE PROBLEM

The problem for the study was stated as "Impactof Learning ICT as a Subject on Secondary School Students' Self-Regulation"

VARIABLES OF THE STUDY

1. ICT Subject
2. Self-Regulation

DEFINITIONS OF THE VARIABLES

ICT Subject – It is defined as information and communication technology introduced as a subject in Standard IX and X of SSC board schools in Maharashtra. The subject comprises of theory as well as practical applications of ICT with reference to the computer softwares like Word, Excel, Power-point,and use of Internet and ICT with its ethics.

Self-Regulation –It is operationally defined as a process whereby students set goals for their work and then attempt to monitor, regulate and control their cognition, emotions, motivation and actions.

RESEARCH QUESTION

Is there any impact of the newly introduced ICT course/subject in STD. IX on students' self-regulation?

OBJECTIVES OF THE STUDY

The objectives for thestudy are stated as following:

1. To compare self-regulationof students before and after the commencement of the ICT subject in Std. IX.

2. To compare dimensions of self-regulation of students before and after the commencement of the ICT subject in Std. IX.

3. To compare students' self-regulationon the basis of types of schoolbefore and after the commencement of the ICT subject in Std. IX.

4. To compare dimensions of self-regulationofstudents' on the basis of types of school before and after the commencement of the ICT subject in Std. IX.

NULL HYPOTHESES

The hypotheses are stated as follows

1. There is no significant difference in self-regulation of Std. IX students before and after the commencement of the ICT subject.

2. There is no significant difference in dimensions of self-regulation of Std. IX students before and after

the commencement of the ICT subject.

3. There is no significant difference in self-regulationof Std. IX students on the basis of type of school (aided and unaided) before and after the commencement of the ICT subject.

4. There is no significant difference in dimensions of self-regulationof Std. IX students on the basis of type of school (aided and unaided) before and after the commencement of the ICT subject.

RESEARCH DESIGN OF THE STUDY

The Methodology ofthe study is the *outcome evaluation model* of program evaluation which focuses on *effect assessment* which comes under descriptive research.

Like basic explanatory research, effect assessment is concerned with cause and effect. The cause is the ICT subject and its effect is self-regulation in STD. IX students. The ICT subject is taught by the school teachers trained in the subject. Therefore the paradigm for present research is the *"black box model"* (Martyn Hammersely, 1993). According to Martin Hammersely (1993), this model aptly depicts the research paradigm in most evaluation studies. The black box model is the situation in which the input is the program, treatment or intervention, and output is its effects. The connecting process within the box is not readily visible. The researcher was not involved in the program intervention and thus was not visible to the researcher.

Since the ICT subject introduced in Std. IX for students is a 'new full coverage program' randomization while selecting the respondents was not possible, hence the present research seeks to assess the effect of the program using the single case design in the quasi experimental design.

Thus the research has used the "full coverage program" of ICT subject. This will consist of repeated measures of effects before commencement of ICT subjectand after the completion of the subject for same group of respondent of Std. IX of SSC board.

Respondents were Std. IX students selected as sample from Secondary School Certificate Board co-educational schools of Greater Mumbai. Total 1041 student respondents undergoing this ICT programof academic year 2013-2014were considered. Respondents were taken from aided and unaided type of schools.

Self-Regulation ScalebyBrown and Miller's (1991) was used for the study. Miller and Brown formulated the self-regulation tool. This toolpresents 63 items; all 63 items are answered on a 5- point Likert scale.There are seven dimensions of self-regulation:1. **Receiving**relevant information, 2. **Evaluating** the information and comparing it to norms, 3. **Triggering** change, 4. **Searching** for options, 5. **Formulating** a plan, 6. **Implementing** the plan and 7.**Assessing** the plan's effectiveness.

Items in the tools were positively as well as negatively worded statements.The positively worded statements were rated as Strongly Agree=5, Agree=4, Undecided=3, Disagree=2, StronglyDisagree=1. For negatively worded statements scoringwas reversed. The higher the score, higher was the self-regulation, and lower the score, lower the self-regulation.Test-retestreliability for the scale was ($r = .94$, $p < .0001$). Internal consistency of the scalewas 0 .91.

Techniques of **data analysis** help to describe the data and differentiate among the groups. The statistical techniques used in order to describe the data are mean and standard deviation.For testing the hypotheses t- test has been used.

TESTING OF HYPOTHESES

Hypothesis 1 states that there is no significant difference in self-regulation of Std. IX students before and after the commencement of the ICT subject in Std. IX.

Table 1 gives the t values and P values indicating the difference between self-regulation for total respondents before and after the commencement of the ICT subject in Std. IX.

Table 1. Difference in Self-RegulationScores of Secondary School Students Before and After the Commencement of ICT Subject

Variable		N	Mean	SD	t value	P value	Signi-ficance
Self-Regulation	Before	1064	217.38	16.22	0.38	0.70	NS
	After	1041	217.10	17.47			

Pvalue>0.05= Not Significant (NS);Pvalue<0.05=Significant (S)

CONCLUSION

From table 1 it can be seen that the P values for self-regulation is greater than 0.05. Hence, there is no significant difference in the self-regulation, before the commencement of ICT course

and after the completion of the subject. The null hypothesis is, therefore, accepted for self-regulation. This indicates that the self-regulation of students did not change as a result of the subject.

Hypothesis 2 states that there is no significant difference in dimensions of self-regulation of Std. IX students before and after the commencement of the ICT subject in Std. IX

There are seven dimensions of self-regulation, scoresof which are also calculated separately for total respondents.

Table 2 gives the t values and P values indicating the difference in self-regulation dimensions before and after the commencement of the ICT subject in Std. IX for total respondents.

From table 2 it can be seen that the obtained P value >0.05 for all the 7 dimensions of self-regulation, and the t-values are not significant. Thus there is no significant difference in the dimensions of self-regulation of students before and after the

commencement of the ICT subject in Std. IX. This indicates that the subject did not make any difference in the self-regulation of total respondents. The null hypothesis is accepted for all the dimensions of self-regulation. It can be said that both the times before the commencement and after the completion of the ICT subject students were similar in all the dimensions of self-regulation.

Hypothesis 3 states that there is no significant difference in self-regulation of Std. IX students on the basis of types of schools before and after the commencement of the ICT subject in Std. IX.

Table 3 gives the t values and P values indicating the difference between self-regulation for total sample on the basis of type of schools before and after the commencement of the ICT subject in Std. IX.

From table3 it can be seen that the obtained P value is greater than 0.05 indicating that there is no significance in self-regulation for aided schools before and after the commencement of the ICT subject. Hence the null hypothesis is

Table 2. Differences in the Dimensions of Self-Regulation of Secondary School Students Before and After the Commencement of ICT Subject

Variable	Dimensions		N	Mean	SD	t value	P value	Significance
Self-Regulation	Receiving	Before	1064	31.91	4.58	0.85	0.39	NS
		After	1041	31.73	4.84			
	Evaluating	Before	1064	29.42	3.71	0.76	0.45	NS
		After	1041	29.29	4.10			
	Triggering	Before	1064	28.87	3.54	0.5	0.61	NS
		After	1041	28.96	3.58			
	Searching	Before	1064	33.51	4.08	1.71	0.088	NS
		After	1041	33.82	4.08			
	Formulating	Before	1064	29.35	4.53	1.91	0.056	NS
		After	1041	25.03	4.4			
	Implementing	Before	1064	29.84	4.52	1.65	0.099	NS
		After	1041	30.18	4.78			
	Assessing	Before	1064	34.48	4.09	1.65	0.098	NS
		After	1041	34.17	4.52			

Pvalue>0.05= Not Significant (NS);Pvalue<0.05=Significant (S)

Table 3. Differences inSelf-Regulation Scores of Secondary School Students on the Basis of Types of Schools Before and after the Commencement of ICT Subject

Variable	Type		N	Mean	SD	t value	P value	Significance
Self-regulation	Aided	Before	823	218.23	15.84	1.89	0.058	NS
		After	815	216.68	17.48			
	Unaided	Before	241	214.48	17.17	2.6	0.0096	S
		After	226	218.64	17.37			

Pvalue>0.05= Not Significant (NS);Pvalue<0.05=Significant (S)

Table 4. Differences inthe Scores of Seven Dimensions of Self-Regulation of Secondary School Students on theBasisof Types of Schools Before and After the Commencement of ICT Subject

Dimensions	Type		N	Mean	SD	t- value	P value	Significance
Receiving	Aided	Before	873	32.055	4.49	1.14	0.25	NS
		After	815	31.92	4.88			
	Unaided	Before	241	30.95	4.95	0.2	0.84	NS
		After	226	31.04	4.61			
Evaluating	Aided	Before	873	28.85	3.66	1.09	0.27	NS
		After	815	29.06	4.17			
	Unaided	Before	241	28.99	3.90	3.42	0.001	S
		After	226	30.13	3.75			
Triggering	Aided	Before	873	33.65	3.57	24.52	0.00	S
		After	815	29.0	3.56			
	Unaided	Before	241	33.02	3.40	11.92	0.00	S
		After	226	28.70	3.69			
Searching	Aided	Before	873	29.74	4.08	19.04	0.00	S
		After	815	33.8	4.09			
	Unaided	Before	241	28.04	4.11	15.14	0.00	S
		After	226	33.87	4.01			
Formulating	Aided	Before	873	29.99	4.53	2.69	0.007	S
		After	815	29.39	4.63			
	Unaided	Before	241	29.33	4.45	4.38	0.00	S
		After	226	27.47	4.42			
Implementing	Aided	Before	873	34.54	4.46	19.37	0.00	S
		After	815	30.33	4.77			
	Unaided	Before	241	34.26	4.82	10.88	0.00	S
		After	226	29.64	4.80			
Assessing	Aided	Before	873	26.75	4.06	36.31	0.00	S
		After	815	34.14	4.45			
	Unaided	Before	241	27.18	4.28	17.86	0.00	S
		After	226	34.24	4.78			

Pvalue>0.05= Not Significant (NS);Pvalue<0.05=Significant (S)

accepted for aided schools. This indicates that the ICT subject did not make any difference in the self-regulation of students of aided schools. However obtained P value is less than 0.05 for self-regulation of unaided group; hence the null hypothesis is rejected. Thus there is a significant difference in the unaided group on self-regulation.Mean values indicate that students of unaided schools became better at self-regulation after undergoing the subject on ICT.

Hypothesis 4 states that there is no significant difference in the dimensions of self-regulation of Std. IX students on the basis of types of schools before and after the commencement of the ICT subject in Std. IX

There are seven dimensions of self-regulation, which are calculated separately for total respondents.

CONCLUSION

From table 4 it can be seen that obtained P value is >is 0.05 for **receiving** dimension of self-regulation in aided and unaided schools before and after the commencement of ICT subject. Therefore the null hypothesis is accepted for receiving dimension of self-regulation. For **evaluating** dimension the P value is greater than 0.05 and hence is not significant for aided schools before and after the commencement of ICT subject. However for unaided school P value is < 0.05 and therefore it is significant.This indicates that the students of unaided schools became better at evaluating after undergoing the subject.

However for all the five dimensions t value is significant for both aided and unaided schools before and after the commencement of ICT subject.Aided and unaided school students became better in searching and assessing dimensions, but they did not improve in the formulating and implementing dimensions after having gone through the ICT course.

DISCUSSION

The findings of the study show that there is no significant difference in the **total** self-regulationand its dimensions of **total students** of Std. IX after going through the ICT subject. This means that there was not enough impact of the ICT subject on the total self-regulation of Std. IX students.

The **aided** school students did **not differ** in their self-regulation as a result of the ICT subject. However the findings of the study show that there is a significant **difference** in **unaided** school

students. This could be because the unaided school students are perhaps given more opportunity to do practicalwork and gain practice and experience as compared to the aided schools students. Computer laboratory and the other facilities required for the ICT subject are well provided to the students of unaided sections than aided section, which help students in understanding the concept of the subject and development of the skill.

There are seven **dimensions** of self- regulation. All the dimensions play their own role in developing self-regulation in a student. Except **receiving dimension** for **unaided** school students rest of the six dimensions are showing a significant difference. This could be because of unaided students'attitude towards their progress in the ICT subject.They don't keep track of their progress and do not see the effects of their actions, they don't pay attention towards the subject. Whereas for **aided** school students there is no significant differencein the receiving and evaluating dimensions after going through the subject. This could be due to the age factor, since students of Std. IX are the teenager they feel everything is done in right way and is perfect. Theydon't need help and suggestions in their life. But in **other dimensions** like **assessing, implementing, formulating, searching and triggering**the course has influenced the students of the unaided schools. This shows that student try to clear their doubt, they set their goal and plan accordingly to become successful. Students search for more than one solution and then try to work on best one, they can change their ways if they feel their planning is not working properly.

The government, the school authorities managing the aided schools and the teachers need to put in more efforts to ensure that students understand and comprehend the subject and also develop the skills in using computers.Efforts should be made to make available and accessible the resources in terms of physical facilities as well as well trained and committed teachers. This will help students achieve more in the subject, to think in right direction.

IMPLICATIONS

The present study will help Maharashtra Government to know about achievement of their program i.e. introduction of ICT as a compulsory subject for Std. IX and X. It will help the policy makers and other stakeholders to get an idea whether the introduced course is achieving its objectives or not.

An attempt has been made to understand the Std. IX student's level of improvement in self-regulation after completion of ICT course. The present study will encourage the teachers of the schools to know about the achievement of their students through this subject. This will help the principals and teachers to take appropriate steps towards betterment of the program so that students can do better in the subject. Through this study parents will become aware about importance of ICT course in the curriculum.

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