Motivational Effect of Ict on the Secondary School Students: A Study

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ABSTRACT *The use of information and communication technology (ICT) in education has changed the habit of learning among the students. The students are gradually getting motivated by using ICT. This motivational learning with ICT is the focal area of the present investigation. The study aims at assessing the effect of motivation in the use of ICT on the secondary students Sex and Habitat-wise. The authors prepared a test on ICT motivation selecting 4(four) dimensions from those suggested by Don Passey and Colin Rogers (2004) and standardized the test. Internal consistency of test was found by Cronbach's Alpha. Subsequently the test was administered on 700 ninth grade students of both sexes drawn from different habitats of WB. Analysis with ANOVA conclusively showed that students do not significantly differ sex and habitat-wise on motivation in ICT use*

Introduction:

Role of ICT in education is becoming more and more important. The students use various ICT devices like computer, laptop, android phone, tab etc. eagerly in their learning. ICT is used in class room situation through various modes like tutoring, projecting (pp) calculating and even for entertainment. Use of these technologies also enriches of quality of students' learning. The term 'ICT' was introduced around 1992, when e-mail was started to become available to the general public (Pelgrum & Law: 2003). According to UNESCO (2002), ICT may be regarded as the combination of informatics technologies, especially communication technology. The various kinds of ICT, e-mail, audio conferencing, television lessons, radio, broad casting counseling, audio cassettes, and CD ROM, etc. have been used in education for different purposes (Sharma, 2003 & Sanyal, 2001). The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning and research (Yusuf, 2005). A great deal of researches has proven the benefits to the quality of education (Al-Ansari, 2006). Laval and Rehbein (2004) claim in their paper "Technology in Schools: Education, ICT and the Knowledge Society" that ICTs have been utilized in education. According to Cabero (2001), ICT into teaching and learning increases the interaction and reception of information. Cholin (2005); Bhattacharya and Sharma (2007) found that digital libraries helps to access research material and course material from any place at any time. Fister et al. (2008) also depict the power of Tablet PCs to improve mathematics instruction. Academic motivation and motivational effect of ICT in learning are the area drawing more and more attention of students working in the field of education. The Government of India has taken several initiatives during the Eleventh Five Year Plan, (2007-2012) to increase the access to higher education by adopting Networking, Information Technologies etc. In a word, ICT can transform the educational scenario in the country. It can be used as a tool to overcome the issues of cost, less number of teachers, and poor quality of education as well as to overcome time and distance barriers (Mc Gorry, 2002).

Context of a learner plays a major role in determining their level of aspiration-generally ICT motivation in particular. Difference in learning environment of boys and girls in their schools and homes may result in this difference (North & Noyes, 2002; Mey, 2007; Kay, 2008). Volman et al. (2005) have investigated these differences in terms of not only gender but also difference in availability of technical resources in rural and urban locality.

Present study has been conceptualized under this broad frame work of motivational effect of ICT. Following question emerges in the mind of present researchers that whether there exists any diversity in this particular aspect of learning oriented motivation of students or not. Learning oriented motivation significantly depends upon unique trait and contextual back ground of learner (Kennewell & Morgan, 2006). Contextual back ground determines the way to which learner interacts with a learning situation. Home and institutional environment of boys and girls students are not identical. Environment in urban setting also differ from that in rural setting in various aspects and use of internet (Choudhury et al. 2005;Tengtrakul and Peha,2011;North & Noyes, 2002; Mey, 2007; Kay, 2008) and it was reported that no gender difference exists concerning students' attitudes, cognition on performance or elementary school age. Boys are most likely to be well experienced in the use of video games for entertainment purposes at a very early age (Colley 2003; Kent & Facer, 2004). The use of computer games in schools seems to have a positive impact on engagement, and, in particular, on school drop outs, who very often happen to be boys (Kirriemuir, 2004). Moreover, research shows that: girls report less positive attitudes and self- efficacy towards ICT than boys (Sølvberg, 2003; Volman et al., 2005; Enochsson, 2005; OECD, 2005; Lynch, 2007; Tømte & Hatlevik, 2010). Boys and girls report different preferences towards ICT-related tasks and applications (Sølvberg, 2003; Volman et al., 2005; CERI, 2010). For example, girls are most positive (of course not for academic purpose) towards communicative-oriented tools, like creative writing and teamwork applications, while boys are more explorative in their use of ICT (Volman et al., 2005; Volman &Van Eck, 2001). The study is an active search of these pertinent questions. Warschauer (2003); Wade (2004); James (2005) & Rao (2005) highlighted India in the context of digital divide by discussing its infrastructural bottleneck that includes electricity, IT penetration, tele density, and Internet industry.

Therefore the review reveals that though gender in ICT motivation has been investigated by several researchers the findings are extremely contradicting. Hence there is a scope of further research of gender on ICT motivation in order to arrive at a détente conclusion.

CNNIC, 2007 investigated that there were 47.2 computers for every 100 urban households and 2.7 computers for every 100 rural households in China. CNNIC, 2006 indicates the possibility of stronger ICT motivation of urban students than their rural counterpart. Though the rural students have no sufficient ICT, a major percent (53.9%) of them was found to use internet in cyber café (CNNIC, 2007). This study undoubtedly indicates ICT motivation has a major cognitive aspect whether urban –rural students do differ in this aspect or not enough scope is there to conduct research investigation in this light. Therefore overall trend of research in these particular fields indicates possibility of stronger ICT motivation of urban students over their rural counterpart, but the difference on ICT motivation of urban boy urban girl or rural boy rural girl has fair scope to be investigated. Hence, need for knowledge beyond text books, facility of global class room, participation in various competitive programs, good text materials, independent study, discovery learning motivated the students towards the use of ICT. The students of secondary level in West Bengal got access to ICT for educational purposes in the new millennium. Quite a few of them have integrated ICT into their life. Students of rural areas are to take yet more strides to get full access to ICT and to develop requisite motivation. The present study aims at assessing the motivation the secondary students have developed for use of ICT in educational purposes, though investigation of diversity in students ICT motivation due to gender habitat and the interaction is the potential area of research.

Statement of the Problems:
ICT helps in several educational aspects including teaching and learning. The researchers like to study the motivation that have been developed among the secondary school students due to use of ICT by them. For the study the students have been divided sex-wise and habitat-wise. The title of the research problem has been stated as: *Motivational Effect of ICT on the Secondary School Students: A Study*

Variables
Major:
ICT motivation

Categorical variables:
i) Habitat (urban-rural)
ii) Gender (boys-girls)

Operational Definition of Terms:
Internet:
The Internet, simply called the 'Net, is a world wide web (www) system of computer networks. It is consisting of interconnected networks using communication protocols with the help of computer. It was conceived by the Advanced Research Projects Agency (ARPA), USA, in 1969. It is a network of networks of local to global scope, linked by a broad array of electronic, wireless, and optical networking technologies. The Internet carries an extensive range of information resources and services.

ICT:
ICTs stand for information and communication technologies and are defined, for the purposes of this primer, as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information." These technologies include computers, the Internet, broadcasting technologies (radio and television), and telephony. Educational ICT tools can be divided into 3 categories: Input source, Output source and others

ICT Motivation:
Motivation is one kind of eagerness to the education. The children are academically motivated by the ICT. There were indications that ICT impacted positively upon pupils' behavior inside school, and some impact on their behavior outside school. More positive motivation resulted when ICT use was focused on both teaching and learning. ICT uses supported internal cognitive aspects of learning, for example in the case of secondary design and technology, there were indicators that the motivation arising from the use of ICT was linked to enhancements in some subject specific attainment (Brown & Holtzman, 1954)

Delimitation of the Study:
The study was delimited to the Secondary school students, from the selected districts of West Bengal.

Area:
Students of WB, in the districts of North 24 Parganas, Nadia, Hooghly, Purulia & Malda. The schools of the concerned districts were selected *randomly*.

Class-IX (boys and girls both)
Medium of Instruction-Bengali
Board-WB Board of Secondary Education
Sampling technique-Cluster sampling
Sample Size-700 (Boys354+Girls 346)
No. of schools-22 (Boys 11+Girls 11)

Stratification:
Table no. 1: Students & Habitat

Gender	Habitat		Total
	Urban	Rural	
Boys	176	178	354
Girls	171	175	346
Total	347	353	700

Objectives of the Study:
i) To find out if there is any significant motivational effect of ICT on students gender-wise.
ii) To find out if there is any significant motivational effect of ICT on students habitat-wise.
iii) To find out if there is any significant motivational effect of ICT on students due to interaction of gender and habitat.

Hypotheses:
The following **null** hypotheses are to be tested:

H_{01}: The boys and girls do not differ significantly in the mean scores on motivational effect of ICT

H_{02}: The urban and rural students do not differ significantly in the mean scores on motivational effect of ICT

H_{03}: The urban boys and urban girls do not differ significantly in the mean scores on motivational effect of ICT

H_{04}: The rural boys and rural girls do not differ significantly in the mean scores on motivational effect of ICT

H_{05}: The urban boys and rural boys do not differ significantly in the mean scores on motivational effect of ICT

H_{06}: The urban girls and rural girls do not differ significantly in the mean scores on motivational effect of ICT

Methodology:
Tools:
The standardized tools on motivational effect of ICT by Don Passey and Colin Rogers, (2004) were used by incorporating some necessary modification. The dimensions of the test selected for the present purpose were (1) Learning goal, (2) Academic Efficiency, (3) Identified Regulation, and (4) Intrinsic Motivation

Definition of dimensions:
1. **Learning goal:**According to Don Passey and Colin Rogers, (2004): Learning goal is an aim or goal to achieve a certain level set internally at a particular subject or task. Goal is the heart of assessment for learning and establishes big ideas from any learning materials or academic field.
2. **Academic Efficiency:**Academic efficiency is defined as the ability by which a school utilizes its time for the academic development of all its students. The measure of academic efficiency must include three elements: time, students, and ICT. In a more general sense, efficiency is the ability to do things well, successfully. It often specifically comprises the capability of a specific application of effort to produce a specific outcome and able to achieve a desired result.
3. **Identified Regulation:** Identified Regulation is the most autonomous kind of extrinsic motivation. It involves consciously valuing a goal or regulation so that said action is accepted as personally important. In a sense, while the discrete emotion may 'play the tune' of a person's emotional response these emotion regulation process significantly color emotion experience (Thompson, Rass, A, 1993).
4. **Intrinsic Motivation:** Intrinsic motivation is the self-desire to seek out new things and new challenges, to analyze one's capacity, to observe and to gain knowledge change a behavior for his or her own internal satisfaction or fulfillment. It is usually self-applied, and springs from a direct relationship between the individual and the situation. It is very important factor in the design of learning or training course.

Items:
Initially total no. of items in the test was 35 including both the positive and negative statements each having 3 options - Agree, Don't know, Don't agree. The scores of the each item were 3,2,1 respectively for the options for a positive statement and 1,2,3 for negative statement respectively.

Item Analysis
The face and content validity of the test were verified by the experts in a field of computer application and education. 3 (three) items had to be excluded as the raters (experts) could not agree on those items

Expert Rating: (Inter rater agreement ratio):
Table no: 2

Raters agreed on no. of items						Mean Inter Raters' Agreement
1st & 2nd raters	2nd&3rd raters	1st& 3rd raters	Agreement ratio1,2	Agreement ratio 2,3	Agreement ratio1,3	
33	32	31	33/35	32/35	31/35	32/35=0.914

After rejecting the unsuitable items under the advice of experts, 32 items were administered on two hundred students of class IX. Using Cronbach's Alpha (CA) the reliability of the test (in terms of internal consistency of the items) was estimated by SPSS 19.0 version. The values of C A were calculated for each of the remaining 32 items. Rejecting 3 items having low CA, only 29 items were finally selected for administration. The CA for the test was 0.869. This value indicates the high internal consistency of the items as shown in **Table-3**.Time allotted for the final test was 20 minutes. Directions for answering the test were given in the test booklet and they were also verbally communicated to the students.

**Table no. 3: Reliability of the ICT test (Selected Questions)**

Cronbach's Alpha	N of Items
.869	29

Table no. 4: Dimensions of test-questions

Sl.No	Dimensions of test-questions	Number of items
1	Learning Goal	08
2	Academic Efficiency	08
3	Identified Regulation	05
4	Intrinsic Motivation	08
	Total	29

Administration of Test: The final form of the test was administered on 700 students selected by cluster sampling method. The papers were scored.

Presentation of Data:
Table no. 5: The descriptive statistics sex-wise and strata-wise

Pupils	Total	Boys	Girls	Urban	Rural	U.boys	U.girls	R.boys	R.girls
No.	700	354	346	347	353	176	171	178	175
Mean	36.2257	36.0480	36.4075	36.9424	35.5212	36.3295	37.5731	35.7697	35.2686
Median	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	35.0000	36.0000
SD	8.56151	7.96952	9.13562	7.93122	9.09516	8.36280	7.43277	7.57395	10.43380
Q_1	31	32	31	32	30	32	32	31	28
Q_2	36	36	36	36	36	36	36	35	36
Q_3	42	41	43	42	41	42	44	41	42
SKWN	.423	.517	.371	.396	.389	-.666	.059	-.347	-.355
KRTS	.705	1.385	.219	.748	.571	1.379	-.681	1.470	-.083

Table no. 6: Frequency distribution of ICT scores for the total Sample

Scores	2.5-7.5	7.5-12.5	12.5-17.5	17.5-22.5	22.5-27.5	27.5-32.5	32.5-37.5	37.5-42.5	42.5-47.5	47.5-52.5	52.5-57.5
Freq(f)	04	02	11	22	55	131	157	166	79	65	08

Fig. Graphical representation of ICT scores of total sample by Frequency Polygon

Freq. Polygon of ICT Scores: Total Sample
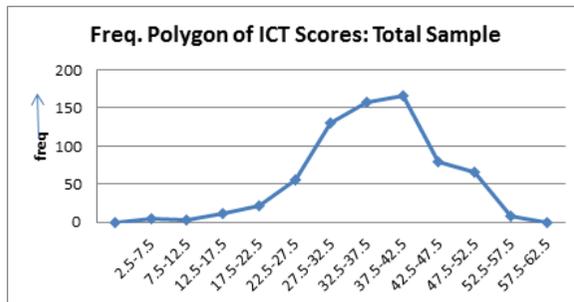
The mean (36.2257) and median (36.0000) of the total sample are very close to each other. The distribution is almost normal with a slight depression on the right

Data Analysis

For testing the null hypotheses, a 2x2 ANOVA and t-tests have been used. To find the main effect of Sex and Habitat ANOVA has been used. To find the interaction of sex and habitat explicitly t-tests have been used. For ANOVA 4(four) cells have been used: Urban Boys(UB), Urban Girls(UG), Rural Boys(RB), Rural Girls(RG).For each cell 50 ICT scores have been randomly selected from the total number of the corresponding cell. The descriptive statistics of the ICT scores of **200** students have been tabulated below sex and habitat-wise.

Table no.7: Mean and SD of the 4 cells of ANOVA

Categories	N	Mean	SD
U.BOYS(UB)	50	36.3295	8.36280
U.GIRLS(UG)	50	37.5731	7.43277
R.BOYS(RB)	50	35.7697	7.57395
R.GIRLS(RG)	50	35.2686	10.43380

Table no. 8: 2x2ANOVA for ICT scores

SOURCES	df	ss	Mean ss	F	P	Significance
Sex	1	39.605	39.605	0.439	P>0.05	NS
Habitat	1	41.405	41.405	0.459	P>0.05	NS
Sex x Habitat	1	244.205	244.205	2.708	P>0.05	NS
ERROR	196	17673.940	90.173			

Hence, Sex, Habitat and Interaction (Sex x Habitat) are not significant as shown in Table no. 8.

Interpretation:

To study the main effects of Motivational impact of ICT on Secondary students gender-wise & habitat-wise, ANOVA (Table no-8) was used. F -values are not significant (p>0.05) for gender and habitat .So (i)Boys and Girls and also (ii) Urban and Rural students do not differ in their mean ICT scores .Thus the null hypotheses H_{01} & H_{02} are retained. Again F–value for Interaction (Sex x Habitat) is not significant (p>0.05) .This indicates that there is no significant difference between the pairs of cells for ANOVA. If t-test is done for the pairs of cells, no significant mean difference would be found between the cells. Hence the null hypothesis $H_{03 -- } H_{06}$ are all retained.

Findings:

The results in this study shows that there is no significant difference of mean scores on motivational effect of ICT between boys(B) and girls(G); urban(U) & rural (R) students and between any combinations of them.

Limitation of the study:

The present study suffered from several limitations which were as:

i) Motivation is an old issue for research but Motivational effect of ICT is relatively new. Literature for this study was severely limited.
ii) Sample could not be always collected strictly in accordance with rule of cluster sampling due to administrative compulsions of the schools.
iii) Due to time barrier, schools were only selected randomly from five districts (North 24 Parganas, Nadia, Hooghly, Purulia & Malda) of West Bengal though WB has 20 districts.
iv) The sample of this study was only selected from the Govt. aided schools under WBBSE.

Educational implications of the study

(i)The school should provide better environment to improve the study habits with the help of information and communication technologies. When proper infrastructural facilities of ICT could be available in WB, only then enrichment of study habits is possible.(ii) The students must be motivated in the field of academics to modernize their learning style. (iii)Better e- library, digital library facilities should be provided for students to spend more time in reading and preparing for cognitive development. They will get many references, assistance within a few seconds from internet. e-learning systems, video conference, e-mailing and e-tuitions provide more and more knowledge to the learners through ICT. (iv)So teachers should often point out the importance of ICT and techniques of their use in the class room or out of class room.

Discussion:

The present study on motivational effect of ICT on the secondary school students is integrally associated with the progress of Information and Communication Technology (ICT). Different schools got a number of computers for teaching-learning, but the teachers, by and large, preferred to remain aloof from computer education. Those computers ultimately made their way into heap of scrap materials. Later, intervention of different NGOs, computer literacy programs, science exhibition, large scale use of mobile phones, CD, DVD, Floppy disc, Pen drive, Disc drive, Photo communication, Projection, Translation, E-mailing etc. Side by side mobile phone has been transformed into smart phone. The CAI, use of TLM, slide show, projection, lecture, demonstration etc. are the famous output of ICT by which the students have been motivated.

ICT motivation among the students does not differ sex-wise or habitat- wise. It appears that all schools students are similarly motivated by the use of ICT. So, for the use of ICT in education has been growing up. One possible approach might be to include both boys' and girls' various interests and using patterns in respect of ICT in future perspectives, both in research and in policymaking. As long as males' use of ICT still seems to represent the norm, this might indicate a certain challenge for progress (Corneliussen, 2003, Abbiss, 2008). Moreover, it can provide access to education regardless of time and geographical barriers. It can help to enhance the quality of education with advanced practice methods, improve learning outcomes and

enable reform or better management of education systems. So, for the knowledge exploration, educational improvement and for the motivational changes ICT should be used everywhere with best efforts.

Suggestions for further studies:
According to findings of this study on ICT, there are already indications of change towards the improvement of ICT awareness. A study on the subject may be extended by including   students of different socio economic status, castes, age groups, grade level, management of school, school boards and characteristics of habitats.

Conclusion:
As time passes on, students become more and more attached with ICT. This has now gone to such a pass that little difference is found among the different sections of pupils regarding their ICT use and motivation. This state of affairs should be maintained among the children taking care that this motivation never turns into ICT addiction.

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