Cognitive Change in Women's Empowerment in Rural Bangladesh

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Abstract

Rural women in Bangladesh have limited access to resources and public spheres due to socio-cultural restrictions. Women suffer from severe discrimination, due partly to a lack of access to information. Information and communication and technologies (ICT) are tools that potentially can reach rural women and address their knowledge and information needs. Considering this scenario, the aim of this paper is to examine the situation of rural women using ICT tools provided by non-government and government organizations, and investigate whether access to ICT has changed their lives in terms of socio-economic development. Using a structured questionnaire, data was collected from women in villages where two different ICT projects have been introduced. The change in women's awareness, skills and knowledge of the wider environment on various issues (including health, education, legal rights) is described. These cognitive changes were compared in women with ICT intervention and women who did not use ICT. The overall cognitive awareness of the women indicates more changes among women with ICT intervention than without. Therefore, ICT intervention in rural villages in Bangladesh is leading to empowerment.

Keywords: Cognitive change, empowerment, ICT intervention, rural women.

I. INTRODUCTION

In Bangladesh, 45% of the population lives below the poverty line [1]. The main causes of poverty in many developing countries like Bangladesh include gender inequality, lower education, unemployment and income inequality [2]. If rural women in Bangladesh were educated and empowered using ICT tools such as computers, the Internet and mobile phones [3], then poverty could be alleviated and development would be possible in social, economic and other levels of human life.

A study by Ahmed et al. [4] concludes that, in Bangladesh, women's involvement in ICT industries and ICT-based government and non-government organizations (GO & NGO) changes the behavioural aspect of women's lifestyle and thereby affects the society as a whole. An interpretive study on the impact of ICT intervention on development in Bangladesh, [5] discovered that rural people were enthusiastic about ICT intervention despite some negative impact on the culture

of the village. The study showed there are positive prospects for empowerment in ICT use by rural women. In addition, though some ICT interventions in Bangladesh [6] do not benefit rural women economically, they provide information, ultimately changing women's perceptions and expanding their self-esteem.

The research reported in this paper is part of a wider investigation on the issue of women's empowerment. This paper focuses on empowerment in terms of change in *cognitive perspective* (knowledge, education and awareness) through ICT tools, whether economic benefits accrue or not. The aims of this paper are to: identify factors affecting women's empowerment; find the potential of ICT for women's empowerment; implement a model for measuring empowerment; and identify any cognitive change due to intervention activities.

II. BACKGROUND

A. Women's Empowerment

Empowerment refers to power: the ability of people to control their own destinies [7]. There is no universal definition of women's empowerment as many aspects of countries and regions (including socio-cultural, political, and economic factors) influence it. According to The World Bank [8], 'Empowerment is the process of increasing the capacity of individuals or groups to make choices and to transform those choices into desired actions and outcomes. So, one definition of women's empowerment could be changes in women's lives over time through their active participation in a process that gives them control of power and resources.

Empowerment dynamics is complex and multi-dimensional, linked at macro, meso and micro levels [9]. Macro level dynamics (i.e. global, national or regional) directly affect the meso level (i.e. village or community) and occasionally the micro level (i.e. individual or domestic). A connection from macro to meso to micro is needed to ascertain women's empowerment intervention [7]. The central point of gender-based discrimination and the goal of empowerment is the domestic or household level because of the power relation in the family hierarchy [9]. Power dynamics can be analyzed by an individual's access to and control of different spaces within the domestic level. In addition to the interrelated physical, economic, socio-cultural, political, and non-physical spaces, technological empowerment is important [10]. The mental or psychological space of women (the feeling of freedom that allows a person to

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think and act) remains the most critical issue since it has a complex relationship with non-mental spaces. If interventions increase women's level of confidence and self esteem, then a process of empowerment has began, whether expansion in the economic space exists or not.

B. Potential of ICT for Women Empowerment

Information is observed as a prerequisite for empowerment, while participation drives empowerment by encouraging people to be actively involved in the development process, contribute ideas, take initiatives, articulate needs and problems, and assert their autonomy [11]. The UN millennium development project [12] focused on gender equality and empowerment of women as effective ways to combat poverty in a sustainable way. Women's full and equal access to ICT-based economic and educational activities supports their contribution in business and home-based activities and helps them become more empowered. ICT provide opportunities for women including overcoming illiteracy, creating opportunities for entrepreneurship, and allowing women to work from home. By accessing information from rural locations, women can enrich and enhance their quality of life.

When used effectively, ICTs can be a powerful tool for women's empowerment. They can create better opportunities for women to exchange information, gain access to on-line education and to engage in e-commerce activities [15]. Successful case studies from many countries describe the use of ICT as a tool for the economic empowerment of women [13] and participation in public life [10], enhancing women's skills and capabilities in society [14]. However, ICT cannot do anything by itself; it can just open the gateway [16]. Women's real life experience and knowledge can be used as an information source for other women in similar contexts and thus their ability and skill is increased as they gain insight into social, economic and political processes and which leads to an overall improvement of life. So policy makers and government bodies should take appropriate measures to use ICT effectively.

C. Women's Empowerment Factors

Without appropriate utilization, ICT cannot bring individual or collective change to the lives of women. Resources (ICT tools) are not the only component of women's empowerment; they can only be a catalyst [9]. Awareness must be developed among women and the stereotype mindset towards women's ICT use must be removed. The factors that are important for women's empowerment through ICT intervention can be categorized in two ways: enabling and disabling factors. Enabling factors to promote ICT include extensive telecommunication networks, good ICT infrastructure, availability of educated women, and low capital investment for ICT micro enterprises [13]. The lack of skilled and trained women, cost of training, and lack of

micro credit and supporting organizations are disabling factors in promoting ICT. These must be addressed so that ICT can be considered as an enabling factor, advancing women's status and their quality of life by using, exchanging, and producing information and knowledge and gaining economic empowerment through ICT-based job opportunities.
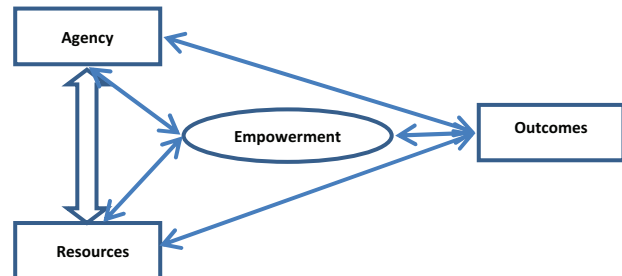

Fig. 1. A conceptual framework showing relationships between resources, agency and outcomes correlating empowerment (based on [17]).

Generally, two key factors in the process of empowerment are identified: control over resources (the conditions for empowerment); and agency (the ability to formulate choices). Separating the process into components (such as enabling factors, agency and outcomes) may be useful [17] for understanding that empowerment is a dynamic process (see Fig. 1).

A consolidated framework [18] details four broad pathways through which individuals' experiences change: (i) *Material pathway* addresses changes in access to or control over material resources such as in the level of income, satisfaction of basic needs or earning capacity; (ii) *Cognitive pathway* addresses changes in level of knowledge, skills or awareness of wider environment; (iii) *Perceptual pathway* addresses changes in individual confidence level, self-esteem and vision of the future; and (iv) *Relational pathway*, addresses changes in decision-making roles, bargaining power, participation in non-family groups, dependence on others, and mobility.

The model developed by Lennie [10] adds the dimension of technology to social, political and psychological empowerment for women. To identify the changes in women's technological awareness after using ICT, Lennie's questions are incorporated in this study to investigate how ICT affects the mental space of women.

D. Measurement of Women's Empowerment

Although ICT is used to examine women's empowerment in many countries, there is no rigorous method for measuring and tracking changes in levels of empowerment by ICT intervention. For example, multiple research methods (including participant observation, individual and group interviews, analysis of email, qualitative and quantitative data from questionnaires, and statistical analysis of demographic and personal information) were used to investigate empowerment and disempowerment of rural women in Australia, a developed country [10]. The key activities

in the project were workshops, online conversation groups and audio conferences. Another study, in India, reported on primary and secondary data analyses from the IT industries, ICT-promoting GOs and NGOs, IT professional and related websites. This case study was conducted to ascertain the success factors of a Kudumbhasree project through a SWOT analysis (strengths, weaknesses, opportunities and threats) within the project [13].

III. METHODOLOGY

As noted previously, empowerment of women is considered in two ways: as a process through which there is a change for greater equality or greater freedom of choice; and action. However, processes are difficult to measure: they cannot be measured directly but through proxies, like health, educational level, and knowledge. Therefore, a framework needs to be developed that can be used across settings to address empowerment at the meso as well as the macro and micro levels, thus covering multiple dimensions of women's life in the context of different countries and cultures. Chen's [18] mixed approach, combining a qualitative case study with a quantitative survey to test hypotheses of the impact of micro-enterprises at the individual level is ideal to measure the empowerment of women using ICT in Bangladesh. Chen's conceptual model is considered appropriate because it has been developed for South East Asian countries, where socio-cultural norms are similar and women in rural areas suffer similar types of discrimination.

This study focuses on individual level impacts. Therefore, the unit of analysis chosen is individual people, and involves interviews with rural women, ICT trainees and members of ICT projects. This is an effective way for collecting original data and for measuring attitudes and the impact of ICT intervention in women's life. The research model is designed in such a way that it illuminates all spheres of women's life and identifies what data to collect for analysis. Taking the concept of women's empowerment as agency, resource and outcome in mind (Fig. 1), the research model was developed taking the pathways of Chen's [18] consolidated framework and Lennie's [10] technological change to measure empowerment.

As illustrated in Fig. 2, the independent variables, such as personal characteristics (education and age) and motivation (type of information, purpose of involvement, and access level), are different for each woman. These variables affect dependent variables like material, relational, cognitive, perceptual and technological change. For example, an educated woman can learn ICT skills more easily and acquire more knowledge and skills than a woman without education and can therefore perceive changes. This paper will focus specifically on women's purpose for involvement in ICT projects and how it affects their knowledge,

awareness and skill. ICT intervention for women's empowerment is a relatively new issue and therefore needs to be examined for the appropriate application of technology for social inclusion.

The research design is based on a questionnaire, appropriate for social research [19], and a comparison of similar groups without researcher intervention. Ten questions investigated cognitive changes after ICT intervention. The rural women were asked to rate their perceived change on a Likert-like scale. The issues addressed were:

  i.   Health of children
  ii.   Education of children
  iii. Level of own knowledge and education
  iv.   Management/supervisory skills (e.g. can supervise a group of people)
  v.   Entrepreneurial skills (e.g. can create a new business)
  vi.   Communication and social skills
  vii. Importance in the family
  viii. Knowledge of legal issues
  ix.   Relationship with family members
  x.   Relationship with friends.

The same questions were asked of non-ICT women. Even though they were not involved in the ICT projects, they may have experienced changes through exposure to other women in the neighbourhood engaged in ICT projects. Therefore, their feelings about ICT and its impact on their lives were also investigated.

A. Case Study

Several projects were identified as addressing ICT for women's development in Bangladesh. Two projects ─ Development Research Network (D.net) [20] and Our Village Online (Amader Gram online) [21] ─ gave permission to work with their beneficiaries. Both projects were at their early stage of ICT intervention and the people involved in the projects were eager to learn the outcome of their approach through the feedback this research could provide. A convenience sample is used based on women who are interested in being interviewed. With the help of project field workers and volunteers, who provided information about project beneficiaries using ICT and not using ICT, data were collected by going from house to house and asking who was available and prepared to give an interview. The ICT projects involve rural women directly with ICT education and training, and indirectly through a village information system. These women are referred to as "ICT women". Women who are not exposed to ICT tools by the ICT projects, but are beneficiaries of the projects indirectly through other programs like health care and education, are also interviewed. These women are referred to as "non-ICT women". In addition, student trainees and project staff (both ICT and non-ICT women) were interviewed at the project offices.
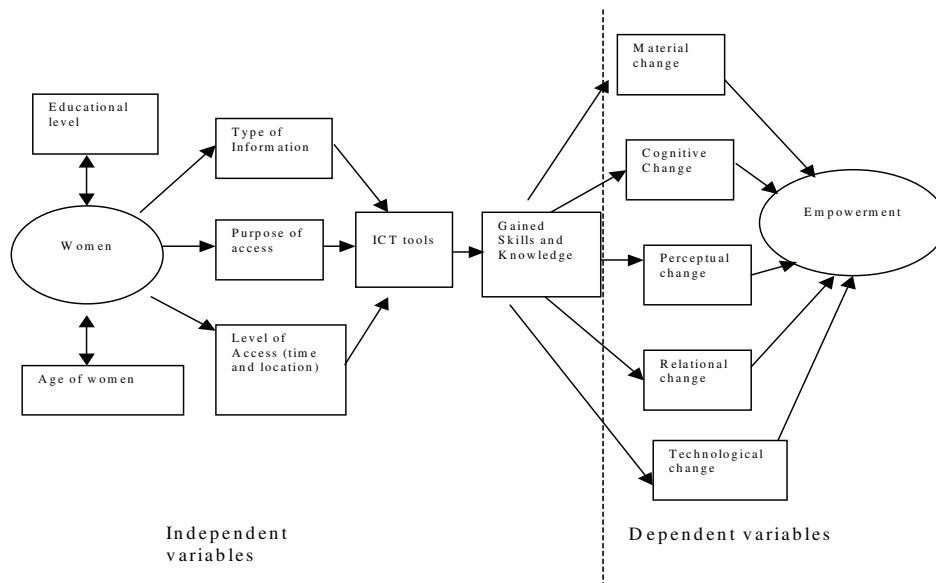
Fig. 2. Proposed model for measuring empowerment for ICT intervention (based on [4, 10, and 18]

IV. ANALYSIS

Demographic data for the interviewees from the two villages in Bangladesh are given in Table I. It can be seen that the highest percentage of women respondents are from age group 21–30 years (61%). Most of the women are married (77%) and have no employment (67%) outside the home. Although a high percentage of women have some form of education and can read (80.46%), only a small percentage of women who can read have completed secondary school (10%) or higher secondary education (24.3%). The majority of women can use a mobile phone as an ICT tool (83%), but only few women can use the Internet (14%) and computers (17%).

The women's purpose of involvement in ICT projects in the two villages is quite different. In Boitpur, most of

the ICT women are student trainees and employees of the project involved in paid training programs of at least three months; they can use a computer and the Internet. So, they are gaining more knowledge and education because of the depth of project purpose.

On the other hand, in Srifoltala village, there are combinations of various categories of purpose of involvement for women. Most of the women participated in the *Computer for All* program, which is a one-day program to introduce computers to rural people. This program involves project staff members carrying a computer on a three-wheeler from door to door, to show groups of people what the computer is, how it works, how important it is, and engage the women by allowing them to touch it and use it so that their fear of new technology can be eliminated.

Table I Demographics of participants.

Demographics		Boitpur		Srifoltala		
		ICT (N = 20)	Non-ICT (N = 30)	ICT (N = 20)	Non-ICT (N = 17)	Total (N = 87)
Age group	< 20 years	6	0	0	0	6
	21-30 years	13	18	14	8	53
	31-40 years	1	10	3	5	19
	41-50 years	0	2	2	4	8
	>50 years	0	0	1	0	1
Marital status	Married	10	27	16	14	67
	Single	10	2	4	2	18
	Other	0	1	0	1	2
Level of education	Unable to read	0	3	5	9	17
	Non-formal schooling	0	5	2	1	8
	Primary school	0	6	3	3	12
	Lower secondary	0	8	5	2	15
	Secondary school	1	4	2	0	7
	Higher secondary	10	4	1	2	17
	Post-secondary	9	2	4	1	16
Employed	Yes	12	5	5	7	29
	No	8	25	15	10	58
ICT use	Mobile	15	22	20	15	72
	Computer	7	4	4	0	15
	Internet	10	0	2	0	12

It was also found that the purpose of involvement in Boitpur for most of the women without ICT is the village information system (90%), and only few are taking advantage of children education and health care. So, non-ICT women are also being advantaged indirectly from ICT through field workers in the project who move from door to door and inform rural women about their livelihood problems. However, in Srifoltala village, although the Amader Gram project has a village information system, the women without ICT are involved in various non-ICT programs such as micro-credit loan program (33%) and health care program (28%). Therefore, they are focusing on various issues instead of ICT training and learning.

V. DISCUSSION OF RESULTS

It can be seen from Figs. 3 and 4 that the overall cognitive awareness of women in both ICT projects indicates greater change with regards to education and knowledge, management/supervisory skills, entrepreneurial skills and communication/social skills for ICT women than non-ICT women. Even though most of the ICT participants are student trainees and have no experience in management or supervisory skills, they are confident that they can do that. Women involved in the D.net project (see Fig. 3) are slightly more aware and have more knowledge than those who are not involved in ICT projects in all factors except education and health of children. The reason for this is that a significant number of students in the ICT group who are not married (50%) and therefore not aware of these children's issues.
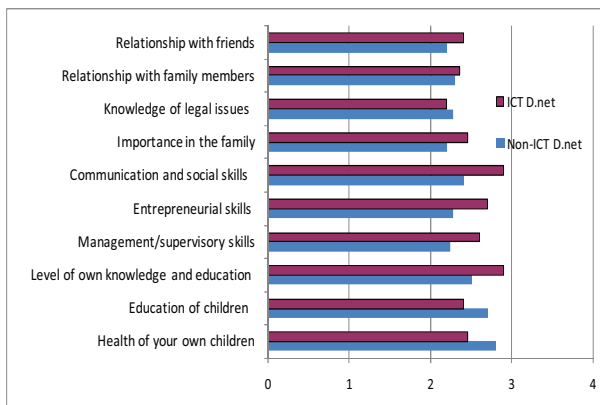

Fig. 3. Average cognitive change of ICT and non-ICT women (D.net).

Similar results are found in the data for ICT and non-ICT women of Amader Gram project (see Fig. 4). ICT women show greater change in many of the factors investigated. However, more non-ICT women are from a higher age group and therefore issues such as relationships with family and friends, knowledge of children's health and education, and knowledge about legal show an increase for these women.
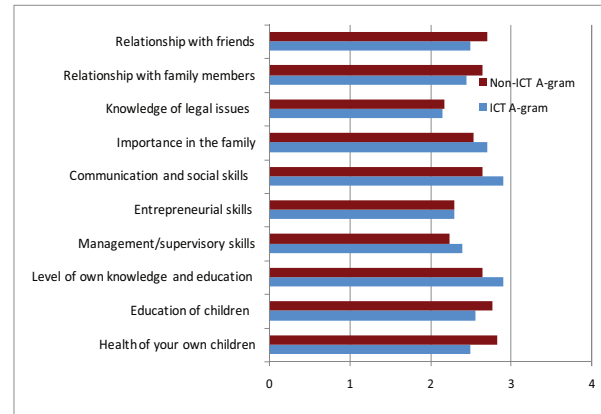

Fig. 4. Average cognitive change of ICT and non-ICT women (Amader Gram).

So, it can be concluded that ICT intervention in the rural village is changing women's knowledge, skills and awareness through education and learning in most factors identified as cognitive. These results are also supported by the comments of interviewees.

For example, Sabina, a mother of four children and aged between 41 and 50, cannot read as she has never attended school. However she is aware of the need of ICT. She sends her youngest daughter (who is studying higher-secondary education) for computer training to increase her job opportunities. She thinks education can change their lives by alleviating poverty. She uses other people's mobile phone in an emergency situation or to obtain information on her relatives. She was a beneficiary of the Amader Gram micro-credit scheme 10 years before. She said:

> I am aware of all kind of knowledge specially health and education of children. I am not afraid of speaking in public which is rare among uneducated women in the village. My husband earns and gives me the money to expend. I also make and sell fishing nets and earn some money. I have importance in the family.

Therefore, it is evident that, in the Amader Gram project, non-ICT women experience more positive cognitive changes than ICT women in terms of health and education of children and relation with family and friends as they are from higher age group and they are involved with other organizations.

CONCLUSION

This paper discussed the issue of women empowerment using ICT tools, and a model was developed to measure cognitive changes in women's mental space leading to empowerment. Even though the results differed between the two villages, it can be concluded that if women's engagement in ICT is active and in-depth in terms of learning and education, then women could become more empowered. Moreover, poverty could be alleviated in rural populations in Bangladesh by women acquiring knowledge and education.

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