A Scale on Digital Empowerment of Digital Natives

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ABSTRACT

Now a days, digital technology has generated a new dimension to information as it is being turn out to be a prime commodity. In addition, connections of networks have attributed to the fast communication with a 'real time' feeling among people across the world. Due to the rapid development and distribution of digital media over the last two decades, access to this media has become crucial of being an active player in our contemporary society. The accessibility of the ICTs must be there because it is Digital access which divides the society not the Digital technology as technology integrates the society. So an effort is made to provide digital technologies to the members of the society. Simply providing access is not the only solution but also making the people empowered to use the digital technologies. Therefore there is a need to know the digital empowerment status of the individuals by developing a tool. If the tool is not standardized and only applied then result will be questionable. Hence, a scale on digital empowerment has been developed based on summated rating (likert technique). Digital empowerment is operationally defined as "a process through which an individual is making fit to the digital technology and harvesting the maximum potentials of the technology with reference to psychological, economical, legal and technical competency".The scale consists of fifty three items under the sub category namely psychological (11 items), legal (10 items), economical (15 items) and technical competency (17items) based on exclusion criteria.

Key words : *Digital natives, Digital empowerment, Psychological, Legal, Economic and Technical competency*

People across the world are connected through the networks due to fast communication with a 'real time' feeling. In the span of a single decade new media like the internet and mobile telephones have revolutionized media cultures around the world. With the growing convergence of radio, TV and computer solutions, including the emergence of various hybrids and specializations, we see how a variety of electronic and digital media are gradually becoming common goods. This transformation in the society, academic environment in particular, has divided society into two worlds- born digital; and born in the world struggling for survival in the digital world. Government of India has announced "Digital India" a programme to transform India into a digitally empowered society and knowledge economy. It aims at changing the manner in which governance and public services are provided to citizens. To make this programme success citizen must have access and some competency to use digital technology. Now a day's Indian users or learners have internet as their first choice for seeking information, but most of them are not having the basic skills to navigate the information super highway. The information seeker should have the basic knowledge for making search strategies, critical thinking and decision making skills for proper use of digital information.

The academic organizations, like universities in particular have good prospect to exploit the full potential of ICTs in research, class room teaching and learning innovatively. Since the use of ICTs in the academic activities has now become omnipresent, students (Digital natives) should always be prepared to make full use of digital devices and enhancing the ability to use the digital contents. The concept of 'digital natives' was first proposed by Prensky (2001) as a generation of people born in or after 1980. He described digital natives as people who lives their lives immersed in digital technologies and that they learn differently from previous generations of people. Further he reported that digital natives have a culture of connectivity and online creating and sharing. They have e-lives that revolve around the internet, where they access information and interact with others, for example blogging, playing online games, downloading music, purchasing and selling online and socialising via social media networks. Digital natives are active experiential learners who like receiving information quickly, are multi-taskers and parallel processors and prefer graphics first over texts.

For making them enable to use the technologies in their day to day life they must be empowered digitally. Now there are two words namely "Empower" and "Digital". "Empowerment" and "Digital empowerment" have been defined by various authors.

Empowerment is defined as the development of the information, skills and abilities that are necessary for individuals to control their own learning activities (Harvey, 2004). According to Sudharani et al. (2000) defined empowerment as the process of challenging existing power relations and gaining greater control over the sources of power. Empowerment is a process of awareness and capacity building leading to greater participation to greater decision making power and control to transformative action.

Kabeer (2004) defined empowerment as the expansion in people's ability to make strategic life choices in a context where this ability was previously denied to them.

Broadly, empowerment can be referred as the expansion choice and action of an individual to shape one's own life. Digital technology will play an important role to make them digitally empowered. Digital empowerment has been defined by different authors.

Digital empowerment means, as digital participants, being adapted to information technologies digitally and making maximum

use of the potentials of information technologies (Akkoyunlu , et al., 2010).

According to Makinen (2006) it lays emphasis on the practicality of digital competency in developing one's life skills and strengthening their capacities in the information society when they utilize their digital powers effectively.

Petrou (2011) defined digital empowerment as the process of developing communication skills by using creative tools/media techniques, focused on peoples' own lives, through story-telling, photography, music, video and narrative. Digital empowerment places the learner at the centre of the teaching method, and draws upon personal experiences to engage them.

Now the question arises, are the learners digitally empowered? To answer this question objectively an instrument is needed to be developed for which result should not be questionable.

In the present context digital empowerment refers to "a process through which an individual is making fit to the digital technology and harvesting the maximum potentials of the technology with reference to psychological, economical, legal and technical competency". Keeping this in mind the present study attempted to develop a scale on digital empowerment. How should a scale be standardized, drawn up and applied? To answer this question a specific objective has been framed as under:

"To develop a scale on digital empowerment".

METHODOLOGY

The scale was prepared and standardized by making use of summated rating technique (also known as likert technique) on digital empowerment. It involves the steps namely

1. Collection of items,
2. Editing of items
3. Selection of items
4. Ordering of items on a psychological continuum and item analysis and
5. Testing of reliability and validity of the scale.

Collection of items

In the construction of the scale for measuring digital empowerment the objective is to select a set of items in such a fashion that the acceptance or rejection of each one will employ a different degree of agreement or disagreement. Having decided to use the likert method of scale construction, a large number of statements on each aspect of digital empowerment to be studied were collected from various sources (a) survey of literature- the various types of literature namely books, journals and internet dealing with the concept and measurement of digital empowerment were studied.

(b) Personal discussions were held with the experts and relevant points were collected as indices of item of digital empowerment.

In this process two hundred fifteen items under four selected sub heads namely psychological, legal, economic and technical competency were collected.

Editing of items

The next step was to edit the selected items. For editing of the items informal criteria was used. The criteria used in this process were as follows:

a) Items must be good indicators of digital empowerment.
b) Items must be objectively observable.
c) The items should be scorable.
d) Items should express single idea.
e) Items should be debatable.
f) Items should have only one interpretation and easy to understand.
g) Vague and non-specific items were discarded and
h) Duplication of items was avoided.

Based on these criteria three items were discarded from the original list of the items.

Selection of items

The abridged list prepared consisted of two hundred twelve items. The selected items were sent to the judges for their responses of agreement and disagreement with the items on five point continuum (strongly agree, agree, undecided, disagree and strongly disagree) against each of the statement. Selection of items was done by factor analysis method.

Ordering of items on a psychological continuum and item analysis

Items were placed on a psychological continuum on the basis of likert technique. In item analysis each item is examined to see how well it discriminates between who hold different levels of digital empowerment.

For item analysis the items were sent to hundred judges. If the item was the strongly positive one 'strongly agree' was given the numerical value of 4 and 'strongly disagree' the numerical value 0. "Agree" was given 3. "Disagree "was given 1.If the item was a negative one 'strongly disagree' was given the numerical value of 4 and 'strongly agree' the value of 0. 'Agree' was given 1. 'Disagree' was given 3.Undecided was given the numerical value of 2.The scores for each individual on each scale were computed by summing the weights of the individual item

response. For this study the technique factor analysis was used. It is used to explore to screen items. It was performed to find out correlations of the responses given by judges on digital empowerment. The questions were asked under sub categories psychological, legal, economic, and technical competency. Under each category responses were subjected to exploratory factor analysis to identify the latent factors that are supposed to generate the original items. The data have been plotted in a graph called scree plot (Cattell, 1966). It is a graph in which Eigen values are plotted on the 'y' axis and the factor associated with the 'y' value on the 'x' axis .This technique is used to identify the statistical important factors which are to be retained in an analysis. Figure: 1-4 (given in appendix 2) depict very characteristic shape of the scree plot where there is a sharp descent in the curve followed by tailing off this point of inflexion of the curve is taken as cut off point for selecting factors.

Testing of reliability and validity of the scale

Reliability

Reliability is an important test for judging the stability or consistency of the scale. It is the extent to which the instrument is consistently and precisely measures the phenomenon to be measured. There are various methods used for reliability test of a scale. In the present study test-retest method was used to find out the coefficient of stability. Correlations of the scale scores were taken at two different times with a short interval (two weeks).There were thirty respondents not to be included in the sample. Two responses were recorded and correlation analysis was worked out and found to be 0.7947.This shows that the scale has high reliability in terms of stability. This test indicates relatively high reliability of the scale in terms of usual standards.

Validity

It refers to the extent to which a test or other technique measures what it is purported or intended to measure. In other words are we measuring what we intend to measure ?

In the present study content validity was used to measure the validity of the scale. It was measured by the extent to which the items included in the scale represent the total universe of digital empowerment. This type of the validity of the scale has been satisfied by the manner in which the items have been collected and selected. The universe of the concept was covered widely and sampled through interviews with the various experts and literatures available.

RESULTS AND DISCUSSION

The correlation matrix for the different items under each category was subjected to factor analysis by using principles component method of factor extraction. An orthogonal rotation method i.e. the Varimax method was also used to minimize the number of items that have high loadings on each factor. The loadings (correlations) of the original items with latent factors were used to screen out those items which carried similar or overlapping meaning by the experts of the field. There were two hundred twelve items loaded well in four main sub-categories. Out of two hundred twelve items only fifty three items were found to be relevant (correlation value more than 0.60) under four sub-categories based on the exclusion criteria. Field (2006) suggests that loading of an absolute value of more than 0.3 is important. In the present study it is more than 0.3 i.e. 0.6 due to small size of sample. Through this process one hundred fifty nine items were screened out. Remaining fifty three items were finally selected for the scale under sub- categories namely I) psychological (11 items), II) Legal (10 items), III) economic (15 items) and IV) technical competency (17 items).

The fifty three items have been presented in appendix 1.Under psychological aspect item numbers 2,5,6,7,8,10 and 11 are negative. Item numbers 1, 3, 4 and 9 are positive. Under legal aspect item numbers 12, 13,14,15,19 and 20 are positive whereas item numbers 16, 17, 18 and 21 are negative. Under economic aspect item numbers 22,24,27,29,30,31,32,33,34,35 and 36 are negative whereas item numbers 23, 25, 26 and 28 are positive. Under technical competency aspect item numbers 39,40,41,42,43,44,45,46,47,48,49,50,51,52, and 53 are positive whereas item numbers 37 and 38 are negative.

CONCLUSION

To know the digital empowerment status of the individuals a scale was developed. Techniques of scale development through summated rating also known as likert method of scale construction (Bird, 1940) have been followed. Digital empowerment is operationally defined as "a process through which an individual is making fit to the digital technology and harvesting the maximum potentials of the technology with reference to psychological, economic, legal and technical competency".The scale consists of fifty three items under the sub category namely psychological (11 items), legal (10 items), economical (15 items) and technical competency (17 items) based on exclusion criteria. The highly significant correlation coefficient of reliability through test and retest method is r = 0.7947 indicate that the study was highly stable or dependable for measurement. Empirical tool to measure digital empowerment will help to judge the state of preparedness of citizens for implementing any digital as well as developmental programme.

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Appendix 1

Psychological

In the present study psychological dimension of digital empowerment has been operationally defined as pertaining to, dealing with, or affecting the mind, especially as a function of feeling and motivation.

SA= Strongly Agree, A=Agree, U=Undecided, D=Disagree, SD=Strongly Disagree

S. N.	Statements	SA	A	U	D	SD
1.	1Digital technology allows gaining information regarding development leading to a successful person.					
2.	Technology has replaced our old way of interacting and increased loneliness due to addiction of new technologies.					
3.	One can achieve the impossible with the help of digital technologies.					
4.	One can find effective solutions to the social problems by participating in discussions on the social networks.					
5.	Digital technologies open up the possibilities of becoming unethical.					
6.	Finding the right material for a specific task results in time loss due to large volume of digital information.					
7.	Reliance on digital technology leads to poor study habits and unfavourable attitude towards the education.					
8.	Digital age has created inequalities leading to frustration.					
9.	Acquaintance to digital technology leads to harmony and peace.					
10.	New technology confuses me.					
11.	Digital technologies are making people mechanical and dependent.					

Legal

In the present study legal dimension of digital empowerment has been operationally defined as acceptable or allowable activities under official rules.

S.N.	Statements	SA	A	U	D	SD
12.	Sections and specific laws of "Data protection act, 1970" and "Information technology act, 2000" are useful in every sphere.					
13.	Issues related to legal and ethics are essential for achieving and using digital information.					
14.	Pirated software, cyber trafficking, cyber vandalism, Cyber squatting and cyber terrorism can be prohibited through legal means.					
15.	Watching obscene material using digital technologies comes under cyber crimes against persons.					
16.	Legal aspects of digital expression prohibit freedom of speech.					
17.	Cyber mediation creates an electronic record violating privacy.					
18.	Digitization violates the copy right law.					
19.	Digital capability of the people can improve effective governance.					
20.	Carding of ATM cards comes under cyber crime.					
21.	Cyber laws force the person to post positive things.					

Economic

In the present study economic dimension of digital empowerment has been operationally defined as economy that is based on digital computing technologies.

S.N.	Statements	SA	A	U	D	SD
22.	Online shopping is location specific for delivery of products.					
23.	People prefer to join the website established by entrepreneur.					
24.	Online shopping diminishes satisfaction.					
25.	E-business has resulted in improved customer services through transparency.					
26.	People prefer to purchase goods online than offline.					
27.	E-business leads to the lack of growth sectors on account of product or sector limitations.					
28.	People like to go for online banking.					
29.	E-business has reduced the interaction between consumer and seller.					
30.	E-commerce may be responsible for consolidation and increase in income inequality.					
31.	E-business leads to lack of information about demand and supply of the product.					
32.	Online shopping makes it extremely difficult to exchange items in case of discrepancies.					
33.	Use of internet for online transactions leads to victim of online fraud.					
34.	Different shopping portals promise to deliver goods by a certain time but it gets delayed.					
35.	Digital technologies make it difficult to take business related decision.					
36.	Digital technologies require high cost of maintenance.					

Technical competency						
In the present study technical competency dimension of digital empowerment has been operationally defined as to use computer information, visit to websites, reading and writing data from storage device successfully or efficiently.						
S.N.	**Statements**	**SA**	**A**	**U**	**D**	**SD**
37.	I have not heard and used 3D printers, smart glasses, smart watches etc.					
38.	I have not heard and used smart phone,tablets,4G mobile etc.					
39.	One can do lots of different things on the gadgets.					
40.	One can use internet at home and cafes.					
41.	One prefers to use contact friends by text message than by phone call.					
42.	One can edit, retouch a digital photo and snap chat.					
43.	People know about QR code (Quick response code).					
44.	One can use a web based file sharing system (Drop box).					
45.	Individual can use social networks (LinkedIn, Face book, Twitter etc.) for communication with his/her friend and family.					
46.	One can download and uses e -resource (e -research, projects, journals, articles etc.)					
47.	People can use an e -book reader and participate in online courses.					
48.	Individual can do IM (Instant message).					
49.	One can use instagram and upload to a cloud.					
50.	One can make a skype or face time video call.					
51.	One can develop screening strategies (identifying keywords, boolean using the operators etc.) and evaluate web resources.					
52.	One can participate in participate in online forums and post a product review online.					
53.	One can use internet information search tools (search engines, directories etc.) and virtual library.					

Source :