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A scale to measure digital empowerment of students

Kirti and Dipak De

Abstract
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 media, information and communication is gradually becoming common goods. 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 omnipresent so, students should always be prepared to make full use of digital devices and enhancing the ability to use the digital contents. So the students should be raised as individuals furnished with digital empowerment so that they become efficient in this multi-dimensional digital world. 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, Legal, Economical, and Technical competency".The scale consists of thirty nine items under the sub category namely psychological (4items), legal (3items), economical (9items) and technical competency (23items) based on item correlation technique.

Keywords: Digital, Empowerment, Digital empowerment, psychological, legal, economic and technical competency

Introduction
Nowadays, 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. 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 programmeto prepare India for a Knowledge Future. It aims at changing the manner in which governance and public services are provided to citizens. Digitally empowered society and knowledge economy are the major initiatives of "Digital India Programme".

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 should always be prepared to make full use of digital devices and enhancing the ability to use the digital contents. Students must have a culture of connectivity and online creating and sharing of ideas. They must 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. They should be active experiential learners who like receiving information quickly and prefer graphics first over texts.

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

Digital: describes electronic technology that generates, stores, and processes data in terms of two states: positive and non-positive. Positive is expressed or represented by the number 1 and non-positive by the number 0. (http://whatis.techtarget.com).

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).

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) 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, do they have capability to use digital devices up to its full potential? To answer this question objectively an instrument is needed to be developed on Digital Empowerment 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, Legal, Economical, 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 through item correlation technique.

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 item correlation was used. It is used to explore the 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 correlation method in evaluating the individual statement.

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 twenty five respondents not to be included in the sample. Two responses were recorded and

Correlation analysis was worked out and found to be 0.607.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.

Result and discussion

The correlation matrix for the different items under each category was worked out. Through this process one hundred seventy three items were screened out. Remaining thirty nine items were finally selected for the scale under sub- categories namely I) psychological (4items), II) Legal (3items), III) Economic (9items) and IV) Technical competency (23items).

The thirty nine items have been presented in appendix 1. Under psychological aspect all items 1, 2, 3 and 4 are positive. Under legal aspect all items 5, 6 and 7are positive Under economic aspect item numbers 8, 9, 10, 11, 12, 13, 14 and 15are positive and item number 16 is negative. Under technical competency aspect item numbers 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29 and 30 are positive whereas item numbers 31, 32, 33, 34, 35, 36, 37, 38 and 39 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, Legal, Economic, and Technical competency".The scale consists of thirty nine items under the sub category namely psychological (4items), legal (3items), economical (9items) and technical competency (23 items) based on item correlation technique. The highly significant correlation coefficient of reliability through test and retest method is r = 0.607 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 students 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	Digital technology Provides information regarding developments related to our daily life.					
2	I like to use the Internet to discover new things.					
3	Achievements of the students using digital technology efficiently encourage me.					
4	I have excitement in interaction with the Internet and a huge amount of the information.					
Legal						
In the present study legal dimension of digital empowerment has been operationally defined as acceptable or allowable under official rules.						
S.N.	**Statements**	**SA**	**A**	**U**	**D**	**SD**
5	I am aware of the term "computer hacking".					
6	Dissemination of obscene material using digital technologies is an offence comes under section 67 of Information Technology Act.					

7	Indian Penal Code section 292 deals with obscenity.					
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**
8	I have purchased goods online.					
9	I have purchased from Amazon.					
10	Online shopping saves time and energy.					
11	Shopping online allows us privacy.					
12	Activities of e-business tools include Electronic retailing (e-Tailing).					
13	Activities of e-business tools include Use of the internet, intranets or extranets to conduct research and manage business activities.					
14	Activities of e-business tools include Web-site marketing.					
15	E-Business tools include File transfer.					
16	Online shopping diminishes Instant Satisfaction.					
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**
17	I have downloaded music online.					
18	I have uploaded a facebook profile photo.					
19	I can use Internet cafes.					
20	I can take advantage of internet connection of the library.					
21	I can use Internet information search tools (search engines, directories, advanced search such as engines).					
22	I am able to use Social networks (Facebook, Twitter, Blogs) for communication with my family and friends.					
23	I have watched a web video.					
24	I can describe Twitter.					
25	I subscribes to a podcast.					
26	I can describe LinkedIn.					
27	I have my account on LinkedIn.					
28	I use to download music.					
29	I use to download free software.					
30	I own and use 3D printers.					
31	I've heard of 4G mobile but don't know much about it					
32	I know a lot about Smart glasses such as Google glass (spectacles), but I haven't used it.					
33	I've heard of Smart glasses such as Google glass (spectacles) but don't know much about it					
34	I've not heard of Smart glasses such as Google glass (spectacles).					
35	I know a lot about Smart watches, but I haven't used it.					
36	I know a bit about Smart watches, but I haven't used it					
37	I've heard of Smart watches but don't know much about it					
38	I know a bit about 3D printers, but I haven't used it					
39	I've heard of 3D printers but don't know much about it					