International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 06, 2020
ISSN: 1475-7192

TEACHER LEARNABILITY PREPAREDNESS IN GOA & STATE INTERVENTION

[1]*Renji George Amballoor, [2]Shankar B. Naik

.

ABSTRACT-- *The objective of the paper is to understand the dynamics of the ecosystem in influencing the Teacher Learnability Ecosystem in Higher Education institutions in the Indian State of Goa. This study identifies the factors influencing Teacher Learnability and has ranked them on the basis of their influence. The study has worked out the moderation effect of age, nature of appointment and designation on the Teacher Learnability.*

Keywords- *Learning, Unlearning, Relearning Teacher Learnability Preparedness , Learning 4.0, Higher Education*

I. INTRODUCTION

The diffusion of digital technologies is disrupting every sector of the economy including the Higher Education with the ushering of Learning 4.0. Learning 4.0 scenario provides flexible, customized, outcome based, lifelong, experiential learning and with larger choices for enhancing competency and skills of students. Learning 4.0 is an off-shoot of Industry 4.0 (I4.0) (Schwab,2016), wherein Internet of Things (IoT), Big Data, Artificial Intelligence (AI), Robotics, Sensors, etc. have created an alliance for a new industrial scene. According to McKinsey Global Institute (2018), the unfolding Industrial narrative requires workforce with new skill sets, competencies, outlook, etc.

In order to equip students into the world of digital transformation, teaching fraternity has a vital role to play. Teachers, especially those in Higher Education have to be conversant with the intricacies of the new technologies not only for teaching and evaluation but also for research, inculcating soft skills, creativity and scientific temper, classroom data management, etc. Teachers have to become smart in order to tap the technology for opening bigger opportunities in data collection, visualization and analyses, preparing, reviewing and publishing the scientific papers in highly indexed journals, registering for and completing Massive Open Online Courses (MOOC) for skill upgradation, attending Online Faculty Development Programmes (FDP) as a part of capacity building, etc. In this process, unlearning and relearning is a herculean task. One of the biggest challenges before the policy makers and educational administrators is to understand, measure and incentivize teacher for improving his/her learnability preparedness. The concerned governments have to work out optimal strategies for creating a congenial ecosystem for enhancing the teacher learnability preparedness through policy interventions. Unless we leapfrog the teacher learnability preparedness, we may end up creating non-competitive, non-marketable and unemployable workforce thereby preparing a launching pad for the demographic dividend to become a disaster.

[1] Directorate of Higher Education,Govt. of Goa- amballoor@gmail.com, 9421247960*

[2] Directorate of Higher Education,Govt. of Goaxekhar@rediffmail.com, 9420897135

Received: 22 Feb 2020 | Revised: 13 Mar 2020 | Accepted: 05 Apr 2020

The remainder of the paper is organized as follows. The work related to the study is presented in section 2 while the objectives are mentioned in section 3. Section 4 describes the methodology adopted. The observations and findings are presented in section 5 and section 6 concludes the paper.

II. RELATED WORK

Digital technologies open a floodgate of opportunities for the teacher to plan and implement educational activities for improving the skills and competencies of his/her students (Alvarez et al. 2016). According to Carroll et al. (2003), positive learnability is one of the important factors required by the teacher for adopting any new technology. Learnability can be equated with the time taken by the teacher to learn the dynamics of interaction with the computer technology (Faulkner, 1998). Aldunate (2013) identified two models about the teacher adoption of technology. According to Technological Acceptance Model (Davis, 1989), teacher technology adoption is influenced by the perceived usefulness and ease of use. The second school is of the opinion that technology adoption is a sequential process (Zellweger,2007).

All studies mentioned above define learnability preparedness of teacherson the basis of the ease of adopting and using digital technologies. Further none of these studies discusses about the need for collaboration between different disciplines and Computation Science. George & Shankar (2020) have brought out how the trans-disciplinary approach between Social Science and Artificial Intelligence (AI) has enhanced the scope and the vitality of both disciplines. Such an approach can improve the ease of enhancing the learnability preparedness of teachers.

In this paper, we measure learnability preparedeness in terms of the academic achievements of the teacher before and after securing his/her doctorate degree. To the best of our knowledge there are no major studies done to understand the learnability preparedness of teachers in Goa from this angle.

III. OBJECTIVES

The objectives of the study are:

1. Understand the Ecosystem of teacher learnability at Higher Educationin the State of Goa.
2. Quantify the Learnability Index of teachers in non-professional degreecolleges in Goa.
3. Identify and rank the factors influencing life-long learning, unlearningand relearning.
4. Analyse the moderation effect of *age*, *nature of appointment* and *designation* attributes on teacher learnability.
5. For the purpose of policy intervention, convey the major findings of thestudy to the Govt. of Goa.

IV. THE PROPOSED METHODOLOGY

The details of the population sample, the data collection and analysis methods are described in this section.

1.1 *Population* Sample

The survey was conducted on 968 teachers teaching in the non-professional

Goan colleges under the purview of the Directorate of Higher Education, Govt. of Goa.

Received: 22 Feb 2020 | Revised: 13 Mar 2020 | Accepted: 05 Apr 2020

1.2 Ranking of Factor influencing Learnability

Teachers were asked to rank pre-identified factors, presented to them, based upon their impact on learnability according to them.

Based on their responses, the overall impact of factor F_i on Teacher Learnability, denoted as imp_{Fi} is calculated as

$$imp_{F_i} = \frac{\sum_{j-1}^{m} R_{ji}}{m * n} \quad (1)$$

where m is the number of responses, R_{ij} is the score assigned by respondent j to the factor F_i and n is the number of factors. The value of imp_F lies in the range [0,1]. Factors with impact value close to zero have less impact than those with their impact values nearer to one. The list of factors are presented in table 1.

1.3 Measuring Learnability of Teachers

Teachers were presented with a set of probes elicitating their information about attributes influencing Learnability Index such as the number of research papers published, ongoing and completed research projects undertaken, Faculty Development Programmes attended, MOOCs attended, etc. during two periods i.e. since their appointment as teachers and since the award of their Ph.D. degree. Each attribute is assigned a weight indicating the intensity of the impact of the respective factor on Learnability Index.

For a set of n attributes $A = \{A_i / 1 \leq i \leq n\}$, the Learnability Index LI for an individual teacher for duration d is calculated as

$$LI = \frac{\sum_{i-1}^{n} w_i * a_i}{d} \quad (2)$$

where, a_i and w_i are the score and weight values of the attribute A_i, while d is duration in years.

1.4 Data Collection and Survey Analysis

The Data was collected using an on-line data collection form. The collected data was analyzed using Statistical and Data Mining Techniques which were implemented using Python programming Language.

Table 1: Factors influencing Life-long Learning, Unlearning and Relearning

Rank	Factor	Impact
1	Self Motivation	0.0661
2	Work Environment	0.0639
3	Adaptability to Change	0.0636
4	Good Mentoring	0.0625
5	Family Support	0.0624
6	Academic Leadership	0.0623
7	Infrastructure for Research, Development and Innovation	0.0623
8	Work Life Balance	0.0622
9	Health Parameters	0.0618

Received: 22 Feb 2020 | Revised: 13 Mar 2020 | Accepted: 05 Apr 2020

10	Compatibility with peers for joint projects	0.0610
11	Good Incentive System	0.0606
12	Recognition	0.0600
13	Reduction in Administrative Assignment	0.0592
14	Govt Policies,Rules, Regulations and Procedures	0.0575
15	Industrial Internship for Teachers	0.0551
16	Fate	0.0398
17	Personal Laziness	0.0397

V. OBSERVATIONS AND FINDINGS

1.5 Factors influencing Life-long Learning, Unlearning and Relearning

Table 1 shows lists the factors in the order of their impact on life-long learning, unlearning and relearning.

Based on the responses, the factor 'Self Motivation' has been observed to have the highest impact on life-long learning, unlearning and relearning while factors 'Fate' and 'Personal Laziness' have least impact. This implies that teachers need to be highly motivated to get themselves upgraded constantly .

The management and leadership at the working place need to ensure that the working environment remains conducive for constant upgradation. Besides, providing good infrastructure for research, development and innovation, the leadership and the system should also recognize the efforts put in by the teachers in learning, unlearning and relearning.

1.6 Learnability Index of Teachers

The Learnability Index of teachers in Higher Education in Goa is observed to be 0.4279 per year. These include all teachers teaching in Higher Educational institutes in the Indian state of Goa for the academic year 2019-20.

The Learnability Index of teachers who have been awarded with Ph.D. degree is 0.56887 per year. The Learnability Index of Ph.D. awarded teachers before the award of the degree is 0.55265 per year, while after the award of degree it is 0.59039 per year, which is slightly higher by the factor of 1.06829. This means that teachers in Goa continue to learn and upgrade themselves even after they have recieved their Ph.D. degree.

1.7 Moderation effect of attributes in Learnability Index of Teachers

Besides the information specified in subsection 4.3, information such as *age*, *natureof appointment* and *designation* were also collected. The moderation effect of each of these attributes on the Learnability Index of teachers was analyzed.

Table 2: Moderation effect of *Designation* on Learnability Index

Designation	Learnability Index (per year)
Assistant Professor	0.33679
Associate Professor	0.5033

Principal	0.68562

Table 3: Moderation effect of *Nature of Appointment* on Learnability

Nature of Appointment	Learnability Index (per year)
Regular	0.49593
Contractual Professor	0.18158
Lecture Basis	0.48181

Index

5.3.1 Moderation Effect of Designation

Table 2 demostrates the moderation effect of the attribute *designation* on the Learnability Index of teachers. The Learnability Index of Pricipals is the highest which is followed by that of the Associate Professors and then the Assistant Professor. This means that the Principals of colleges in Goa have been constantly upgrading themselves and the process of their selection good enough to select only those who are upgrading themselves. The low level value of Leanability Index of Assistant Professors is due to the large number of teachers who are appointed on contractual basis

5.3.2 *Moderation Effect of Nature of Appointment*

The moderation effect of the attribute *Natureof Appointment* on the Learnability Index of teachers is shown in table 3. The regular category of teachers and those on lecture basis have higher Learnability Index. The low value of

Learnability Index of those on contractual basis is alarming which poses a

Table 4: Moderation effect of *Age* on Learnability Index

Age	Learnability Index (per year)
Less than 30	0.76609
30-40	0.22206
40-50	0.49541
50-60	0.4827
Above 60	0.38264

question about their workload management.

5.3.3 Moderation Effect of Age

The moderation effect of the attribute *Age* on the Learnability Index of teachers is shown in table 4. The Learnability Index of teachers below 30 years of age is the highest indicating that they are more active in terms of learning new things and getting themselves upgraded than the others. One reason could be the compulsory Refresher and Orientation Courses they need to do. Soon after that, the Learnability Index value gets low. Therafter, it is seen to increase. This is may be due to the tasks undertaken by the teachers which are mandatory for their career advancement.

VI. CONCLUSION AND FUTURE STUDY

In today's secnario, teachers need to constantly get themselves updated not only with the knowledge and matter that they need to teach inside clasrooms, but also have an expert hand in tools and techniques which help them to impart knowledge efficiently. This requires their preparedness to undergoe training and undertake research. The task of measuring and incentivizing teachers for improving his/her learnability preparedness is itself challenging.

This study aims to understand the Teacher Learnability Ecosystem in Higher Education in the State of Goa and also propose a model to measure the Learnability Index of Teachers in non-professional Colleges in Goa. The study involved identifying and ranking factors influencing Teacher Learnability and the analysis of the moderation effect of attributes, namely *age*, *designation* and *nature of appointment*, on Teacher Learnability.

The study is based on the survey conducted for 968 teachers teaching in Higher Educational Institutes in Goa. The findings of the study are significant for policymakers in Goa for the necessary interventions in creating a conducive ecosystem for fostering better learnability among teachers of Higher Education in the State of Goa.

REFERENCES

1. Alvarez David Roldan et al. (2016). Mind the gap: Impact on Learnability of user Interface Design of Authoring Tools for Teachers. International Journal of Human-Computer Studies (94).
2. Aldunate F D. (2013). Teacher Adoption of Technology. Computer in Human Behaviour (29).
3. Carroll S et al.(2003). From Adoption to Use: The Process of Appropriating a Mobile Phone. Australian Journal of Information System (10).
4. Davis F D (1989). Perceived Usefulness, Perceived Ease of Use & User Acceptance of Information. MIS Quarterly 13(3).
5. Faulkner, C., 1998. The Essence of HumanComputer Interaction, Prentice Hall, London.
6. George Amballoor, Renji and B. Naik, Shankar, Widening Social Science - Artificial Intelligence Research Gap: Who Should Bell the Cat? (March 28, 2020). Available at SSRN:https://ssrn.com/abstract=3562972 or http://dx.doi.org/10.2139/ssrn.3562972
7. McKinsey Global Institute (2018). Skill Shift- Automation and Future of Workforce https://www.mckinsey.com/featured-insights/future-of-work/skillshift automation-and-the-future-of-the-workforce
8. Schwab Klaus (2016). The Fourth Industrial Revolution. UK; Portfolio Penguin.
9. Zellweger F (2007). Faculty Adoption of Educational Technology. Educase Quarterly(1).