

# A Study on Digital Pedagogy for School Teachers: Special Reference to Kolhapur

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**Abstract:** The objective of this study is to understand teachers view about the inclusion of digital pedagogy in traditional knowledge delivery process with special reference to Kolhapur district. The study selected 47 techno-savvy teachers from both primary and secondary schools from five blocks namely Chandgad, Gaganbavada, Karvir, Panhala and Radhanagari from Kolhapur District. The data about use of ICT in education is collected from the selected teachers. The study also aimed to know effective implementation of digital pedagogy and its impact on students' performance. The study states that the problems of poor quality of education and high dropout rate of students can be well addressed by ICT integration in education.

**IndexTerms – Digital Pedagogy, Education, Information Communication Technology (ICT), Teaching-Learning Process.**

## I. INTRODUCTION

Digital pedagogy is a new method of teaching and learning with Information Communication Technology (ICT) [8]. In simple words ICT comprises of use of computer, internet, projector, smart TV, smart boards, e-learning material in the form of text, image or pictures, audio, video, animation, power point presentations, special tools for enhanced teaching learning process. ICT in education ensures democratic spread of education which is universal and equal access to quality education. The Government of India is taking many initiatives like - Sarva Shiksha Abhiyan (Education for all) launched in 2000, the Mid-Day Meal scheme initiated in 2001, the Right to Education Act in 2009 - to universalize access to education. As a result enrolment in schools in the age group between 6-14 years, across both rural and urban areas, has been above 95 per cent since 2007. In spite of this, poor quality of rural education does not motivate students to get knowledge. Going to school is like an obligation. The students do not know rationale behind going to school. The main reasons behind poor quality of rural education are depressing standards of rural education, infrastructural inequities, lack of learning materials, lack of connectivity and unavailability of teachers. This results in high dropout rate, poor graduate enrolment ratio. The Government is also taking efforts to enhance the quality through digitalization of education. The digital pedagogy with ICT is practiced for quality education. Three key challenges for ICT integration in education include building ICT Infrastructure, Training the stakeholders and Effective use of ICT in education. Government initiatives like E-kranti, E-basta, National Digital Literacy Mission (NDLM) programme, National Digital Library (NDL) etc. are bringing revolution in education. Innovative use of ICT in general and E-learning in particular can address the problem of poor quality of rural education. The rest of the paper is organized as review of literature, research methodology, data analysis with interpretation and findings with conclusions are given.

## II. LITERATURE REVIEW:

Ghavifekr and Rosdy [1] analyzed teachers' perceptions on effectiveness of ICT integration to support teaching and learning process in classroom. They distributed randomly a survey questionnaire to the total of 101 teachers from 10 public secondary schools in Kuala Lumpur, Malaysia. The data analysis presented a report which stated that the students prefer and enjoy multimedia education than the traditional lecture method. It was observed that, the digitalization of education resulted in increased enrolment, attendance, attentiveness and concentration of the students.

Kundu [2] studied the role of ICT in enhancing quality of life of secondary level schools of West Bengal. The study reported that ICT provided opportunities for effective communication between teachers and students that has never been achieved before. The study also identified barriers and challenges of ICT integration in education. The study also provided policy recommendations for successful integration of ICT in teaching learning process.

Nachimuthu [3] carried out study on e-content development and its need. According to that study, the ICT based education is not mere replacing chalk and talk method by power point presentations. UGC guidelines for e-content development are listed in that paper. Digital pedagogy requires creativity in developing e-content that focuses on cognitive, emotional, behavioral and contextual perspectives.

The British Council and Central Square Foundation Report [4] presented case studies from India on teaching and technology. The report elaborated key concepts like innovative use of technology by teachers, QR-coded Textbooks, Massive Open Online Courses (MOOC), various apps to support the school curriculum. It resulted in clusters of tech-savvy teachers and brought transformation in educational process.

Pandey and Pandey [5] reviewed the use of ICT in teaching and learning in Indian scene during 2010-2020. The finding revealed the positive effect of the integration of ICT in education. ICT implementation is found more prominent in urban areas as compare to rural areas due to availability of infrastructure and training facility.

Mishra et al. [6] presented study on E- Content and claimed that it is an effective tool for teaching and learning in a contemporary education system. The study was focused on the assessment of effectiveness of e-Content. The finding proved that the experimental group students were better than the control group students. It was reflected in the scores gained by students. Thus, it can be concluded that e-content proves to be is very useful tool for teaching green consumerism at secondary level.

Gupta [7] presented four case studies for digital classrooms in Government primary schools in Maharashtra. Case studies of Solapur Zila Parishad (ZP) School, Akole, ZP School, ZP School Shetwasti and ZP School, Soregaon presented in that paper. A

comparative study of those four schools after setting up of digital classrooms is presented based on funding, teachers ability to handle digital gadgets, support from school management committees, e-learning contents , issues etc .

Dangwal and Srivastava [8] carried out study on digital pedagogy. As per their study, in the present era of technology the teachers must be tech-savvy. The authors presented ICT Skills development approach, ICT as Pedagogy approach, ICT as a Subject-specific approach and ICT as a Practical approach for digital integration in Teacher Education. The ICT has been developing very rapidly nowadays. The influence of ICT, especially internet cannot be ignored in our student's lives.

### III. METHODOLOGY

We have used purposive sampling method for data collection. To collect the primary data, we have designed and developed the questionnaire. Our targeted population is the primary and secondary school teachers, who are using ICT in their regular teaching and learning method. The data are collected from 26 different schools from five blocks namely Chandgad, Gaganbavada, Karvir, Panhala, Radhanagari of Kolhapur district, Maharashtra state.

The data is collected from 47 school teachers from these 26 schools. The survey tried to cover primary and secondary schools. Out of these 47 teachers, 36 are primary schools teachers and 11 are secondary schools teachers. The survey questionnaire consists of 30 questions. These questions are related to their demographic characteristics and also related to use of ICT during teaching learning process, acceptance to digital pedagogy and outcomes of digital education. The respondents are asked to read the question and choose their answers based on four-likert scale ranged from 4= Strongly Disagree, 3= Disagree, 2= Agree and 1= Strongly Agree. We have used descriptive analysis to analyze the frequency as well as percentage to analyze the data related to the demographic background. The Radar diagrams are used for better visual representation of the responses.

### IV. DATA ANALYSIS AND INTERPRETATION:

#### a) Data Analysis of general parameters:

In our study 47 school teachers surveyed which included 15 female and 32 male respondents. Many respondents have master degree with additional degree of education. Most of the teachers have more than ten year teaching experience and follow traditional as well as ICT based teaching methods. More than 70% users have tendency to use ICT based teaching strategies. The respondents demanded sufficient ICT infrastructure and training for ICT based effective teaching. About 40% of teachers do not get the technical support during their ICT based teaching. The best part is that about 90% teachers had undergone through training and about 60% teachers have developed their own e-contents with the help of this training. Most of the teachers are using their own e-content as well as used YouTube videos while teaching. Most of the trainings are offered by District Institute of Educational Continuous Professional Development (DIECPD) and District Institute for Education and Training (DIET). About 72% teachers said that the training is not adequate for ICT integration in education. Following tables 1- 12 report the percentage of different demographic characteristics of the respondents as well as use of ICT in teaching learning process.

Table 1: Gender distribution

| Gender | Percentage of Respondent |
|--------|--------------------------|
| Female | 31.91                    |
| Male   | 68.09                    |

Table 2: Education Distribution

| Highest Degree  | Percentage of Respondent |
|-----------------|--------------------------|
| Bachelor Degree | 34.04                    |
| Master Degree   | 65.96                    |

Table 3: Teaching Experience

| Teaching Experience (in years) | Percentage of Respondent |
|--------------------------------|--------------------------|
| Below 10                       | 23.40                    |
| 10 -15                         | 21.28                    |
| 15-20                          | 40.43                    |
| 20-25                          | 14.89                    |

Table 4: Preference to teaching method

| Teaching Method                       | Percentage of Respondent |
|---------------------------------------|--------------------------|
| Traditional                           | 0.00                     |
| ICT Based                             | 19.15                    |
| Both Traditional as well as ICT Based | 80.85                    |

Table 5: Use of (tendency to use) ICT while Teaching

| Teaching Method | Percentage of Respondent |
|-----------------|--------------------------|
| Low             | 0.00                     |
| Medium          | 70.21                    |
| High            | 29.79                    |

Table 6: Limitation while using ICT for education

| Teaching Method          | Percentage of Respondent |
|--------------------------|--------------------------|
| Lack of Training         | 44.68                    |
| Insufficient ICT Devices | 34.04                    |
| Both                     | 10.64                    |
| Other                    | 10.64                    |

Table 7: Technical Support if you face any problem while using ICT devices

| Technical Support | Percentage of Respondent |
|-------------------|--------------------------|
| Yes               | 59.57                    |
| No                | 40.43                    |

Table 8 : E-learning material used

| e-learning material used | Percentage of Respondent |
|--------------------------|--------------------------|
| Education Related        | 27.66                    |
| YouTube                  | 59.57                    |
| Other                    | 10.64                    |
| Both                     | 2.13                     |

Table 9: E-content development

| E-content development | Percentage of Respondent |
|-----------------------|--------------------------|
| Yes                   | 59.57                    |
| No                    | 40.43                    |

Table 10: Training of ICT for Teaching

| Training of ICT for Teaching | Percentage of Respondent |
|------------------------------|--------------------------|
| Yes                          | 91.49                    |
| No                           | 8.51                     |

Table 11: Training of ICT for Teaching given by different agencies

| Name of Agency | Percentage of Respondent |
|----------------|--------------------------|
| DIECPD         | 68.09                    |
| DIET           | 14.89                    |
| Both           | 17.02                    |

Table 12: Adequacy of Training of ICT for Teaching

| Adequate | Percentage of Respondent |
|----------|--------------------------|
| Yes      | 27.66                    |
| No       | 72.34                    |

**b) Domain wise Data Analysis:**

The present study is aimed to know effective use of digital pedagogy and its impact on students’ performance. We have focused on following three domains namely

- A) ICT based teaching learning
- B) Acceptance to digital pedagogy
- C) Outcomes of digital education

Table 13 and 14 respectively report the results of use ICT based teaching learning method and its acceptance. In Table 15, we repost the results related to outcome of the digital education. The Radar diagrams are used to represent the responses for three domains as ICT based teaching learning, acceptance to digital pedagogy and outcomes of digital education.

**Table 13: ICT based teaching learning**

| Question (Q)   | Q No. | Percentage of respondents |              |           |                     | Maximum Percentage | Remark (Overall Response) |
|--|-------|---------------------------|--------------|-----------|---------------------|--------------------|---------------------------|
|  |       | Strongly Disagree (SD)    | Disagree (D) | Agree (A) | Strongly Agree (SA) |                    |                           |
| If ICT is used in teaching, I have time to pay personal attention to the students.                         | A1    | 0                         | 12.77        | 42.55     | 44.68               | 44.68              | A                         |
| Applying ICT in education, motivated student interaction .   | A2    | 0                         | 10.64        | 65.96     | 23.4                | 65.96              | A                         |
| The use of ICT helps to maintain discipline and good behaviour among students.                             | A3    | 0                         | 27.66        | 46.81     | 25.53               | 46.81              | A                         |
| According to me teaching learning process becomes easy with the use of pictures, videos, multimedia        | A4    | 0                         | 4.26         | 25.53     | 70.21               | 70.21              | SA                        |
| The ICT equipments in my school are in working condition and can be used in the teaching-learning process. | A5    | 2.13                      | 12.77        | 68.09     | 17.02               | 68.09              | A                         |
| Liberty is given to teachers for preparing teaching -plan using ICT  | A6    | 6.38                      | 6.38         | 53.19     | 34.04               | 53.19              | A                         |
| Due to the limited availability of ICT, I cannot always use ICT.   | A7    | 8.51                      | 25.53        | 44.68     | 21.28               | 44.68              | A                         |
| Preparation time is insufficient for inclusion of ICT in education   | A8    | 12.77                     | 53.19        | 29.79     | 4.26                | 53.19              | D                         |
| Very little use of ICT equipment by teachers in my school make them unutilized.                            | A9    | 21.28                     | 61.7         | 17.02     | 0                   | 61.7               | D                         |
| If pictures, videos, multimedia are used in teaching, students do not strive for their own study.          | A10   | 34.04                     | 51.06        | 4.26      | 10.64               | 51.06              | D                         |

Most of the teachers agreed with the fact that, ICT based teaching methods helped them to pay personal attention towards students and also helped to maintain discipline and good behavior among students. They also agree that teaching learning resulted in fun with ICT integration in education. Most of them agreed upon availability of ICT equipment in working condition in their schools. It has provided them liberty for preparing teaching-plan using ICT devices.

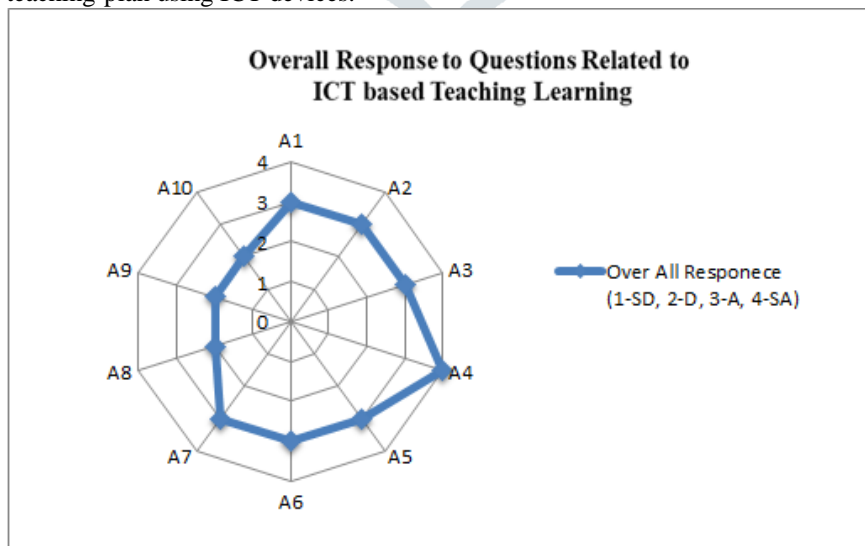


Table 14: Acceptance to digital pedagogy

| Question (Q)   | Q No. | Percentage of respondents |              |           |                     | Maximum Percentage | Remark (Overall Response) |
|--|-------|---------------------------|--------------|-----------|---------------------|--------------------|---------------------------|
|  |       | Strongly Disagree (SD)    | Disagree (D) | Agree (A) | Strongly Agree (SA) |                    |                           |
| I know about the digital pedagogy for effective teaching.  | B1    | 0                         | 12.77        | 53.19     | 34.04               | 53.19              | A                         |
| I am sure I can study ICT techniques myself.   | B2    | 0                         | 0            | 19.15     | 80.85               | 80.85              | SA                        |
| ICT helps to create innovative study materials.  | B3    | 0                         | 2.13         | 23.4      | 74.47               | 74.47              | SA                        |
| I think the things taught by ICT based teaching stay in the minds of students for a long time.   | B4    | 0                         | 4.26         | 34.04     | 61.7                | 61.7               | SA                        |
| Extra time is provided to teachers to grasp ICT skills and apply them easily in teaching.        | B5    | 4.26                      | 19.15        | 53.19     | 23.4                | 53.19              | A                         |
| According to me effective education does not require ICT.  | B6    | 12.77                     | 31.91        | 42.55     | 12.77               | 42.55              | A                         |
| According to me use of ICT in teaching is time consuming.  | B7    | 46.81                     | 48.94        | 4.26      | 0                   | 48.94              | D                         |
| Most of students had no prior knowledge of computers and multimedia.                             | B8    | 4.26                      | 38.3         | 44.68     | 12.77               | 44.68              | A                         |
| I believe that effective learning is always possible without ICT.                                | B9    | 19.15                     | 48.94        | 31.91     | 0                   | 48.94              | D                         |
| Teachers are disappointed because use of ICT in education is not supported by school management. | B10   | 27.66                     | 59.57        | 10.64     | 2.13                | 59.57              | D                         |

Most the teachers are aware about the effective teaching with digital pedagogy. They are self-motivated and confident about studying ICT integration in teaching learning process. They have also agreed that the lessons learned through ICT based innovative study material stayed in the students' minds for a long time. Most of them are of the opinion that effective education does not require ICT but if they want to use it then the extra time have to be given to grasp ICT skills and apply them easily for their teaching methods. They have agreed that the process of use of ICT devices for their teaching is not at all time consuming and their students have the prior knowledge of computer and multimedia. Most the school management supported teachers and they get encouraged and believe that effective teaching and learning process is always possible with the help of ICT.

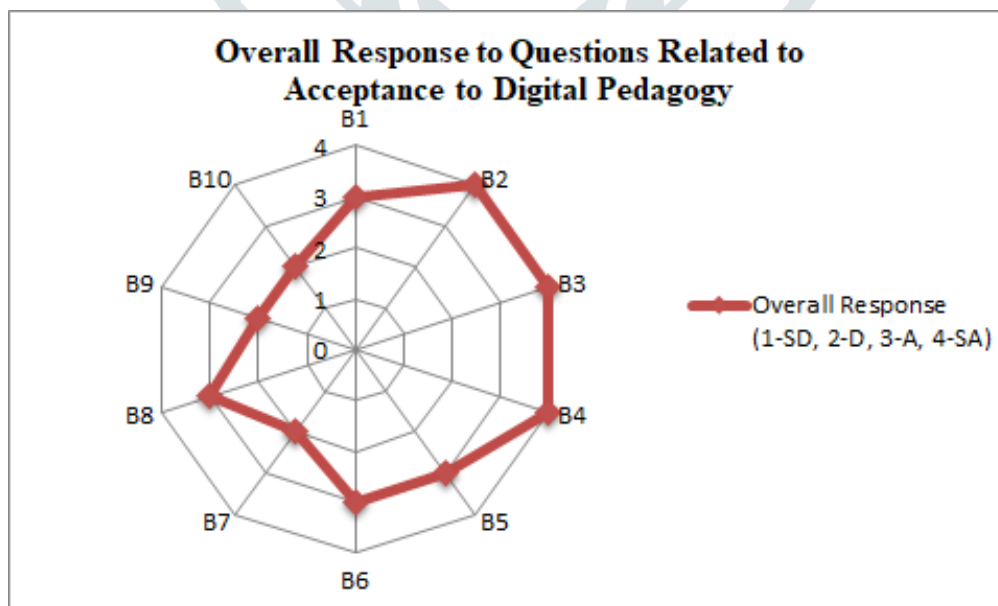
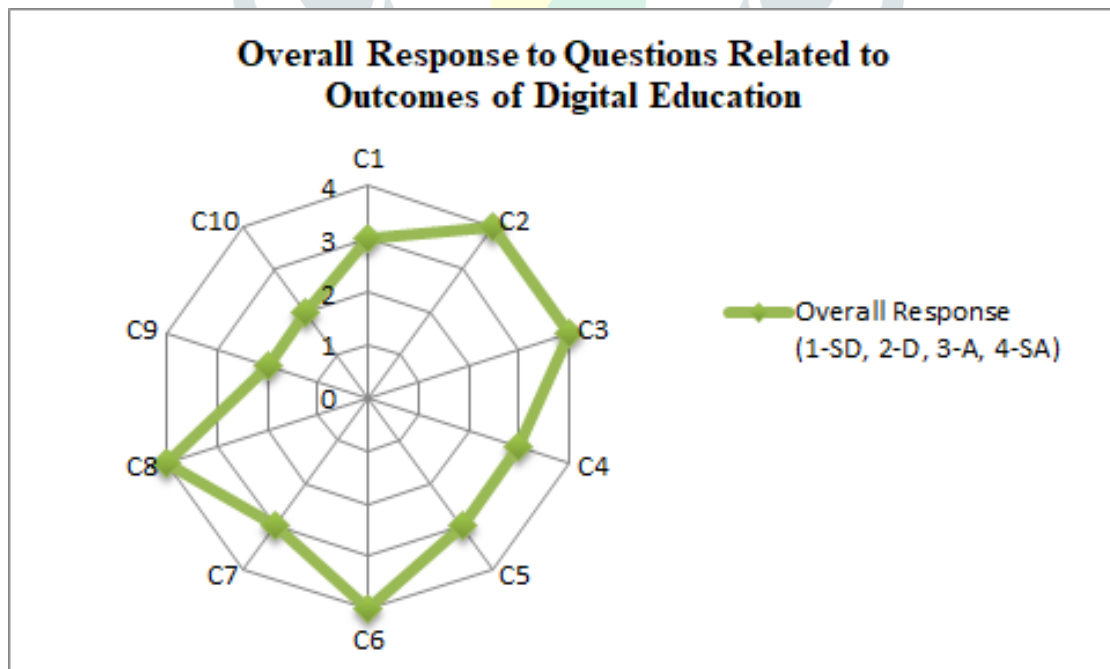


Table 15: Outcomes of digital education

| Question (Q)   | Q No. | Percentage of respondents |              |           |                     | Maximum Percentage | Remark (Overall Response) |
|--|-------|---------------------------|--------------|-----------|---------------------|--------------------|---------------------------|
|  |       | Strongly Disagree (SD)    | Disagree (D) | Agree (A) | Strongly Agree (SA) |                    |                           |
| I think the use of ICT in education reduces the dropout rate of students.                        | C1    | 0                         | 4.26         | 59.57     | 36.17               | 59.57              | A                         |
| I think the use of ICT increases student attendance in the classroom.                            | C2    | 0                         | 0            | 44.68     | 55.32               | 55.32              | SA                        |
| Use of pictures, videos, multimedia in education increases learning interest of students.        | C3    | 0                         | 0            | 48.94     | 51.06               | 51.06              | SA                        |
| Application of ICT enhances active involvement of the students in the class.                     | C4    | 0                         | 6.38         | 53.19     | 40.43               | 53.19              | A                         |
| The use of ICT increases the concentration of students in the classroom.                         | C5    | 0                         | 0            | 70.21     | 29.79               | 70.21              | A                         |
| I think the use of digital content increased students curiosity and commitment in the classroom. | C6    | 0                         | 4.26         | 38.3      | 57.45               | 57.45              | SA                        |
| Application of ICT in education enhances reading, writing skills of students.                    | C7    | 0                         | 27.66        | 40.43     | 31.91               | 40.43              | A                         |
| According to me the use of digital technology ensures high quality teaching                      | C8    | 0                         | 0            | 34.04     | 65.96               | 65.96              | SA                        |
| ICT based education results in the loss of control in classroom.                                 | C9    | 46.81                     | 51.06        | 2.13      | 0                   | 51.06              | D                         |
| Applying ICT in teaching results in negligence of the students                                   | C10   | 44.68                     | 51.06        | 4.26      | 0                   | 51.06              | D                         |

Most of the teachers believe that the use of ICT in education has positive impact in terms of reduced dropout rate of students, increased student attendance in the classroom and increased their learning interest. That ultimate resulted into active involvement of the students in the class, increased their concentration in the classroom, increased students curiosity and commitment in the classroom, and enhanced reading, writing skills of students. Most of the teachers denied that the ICT based education resulted in the loss of control in classroom and by applying ICT in teaching resulted in negligence of the students.



## V. FINDINGS AND CONCLUSION:

It is found that teachers are becoming techno savvy and making use of ICT for effective delivery of knowledge. Training the teachers is important to provide the complete knowledge of broad range of ICT resources in education. Teachers are motivated to prepare their own videos, presentations and ICT based study material. It is observed that use of text, audio, video, graphics, animation, pictures created interest among students and motivated them to get actively involved in teaching learning process. It has resulted in increased enrolment, attendance, attentiveness and interaction of students in the classroom. The infrastructural needs are satisfied to some extent with the funds obtained from government and through community participation. But insufficient digital infrastructure, lack of training to use ICT and lack of technical support in case of digital device failures are major challenges in accepting digital pedagogy effectively.

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