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Awareness of Prospective Teachers towards Open-Source Software

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Abstract
Information and Communication Technology (ICT) in the teaching and learning process has justified the transition to sustainable and affordable online solutions. Open-Source Software (OSS) is an alternative to proprietary paradigms offered on a pedagogical and financial basis, but its use relies on a prospective teacher's familiarity. The Objective of this study was to assess the level of awareness of Open-Source Software (OSS) among prospective teachers and to compare it across urban/rural, and B.Ed./M.Ed. groups differences. This study was conducted through a descriptive survey method. Data were collected from 42 prospective teachers from the Lucknow district of Uttar Pradesh in India, and the sample was selected through a convenience sampling technique. For the collection of data researcher used the Open-Source Software Awareness Scale Prospective Teachers (OSSAS-PT). Data were analysed through mean ,percentages, standard deviation and t test .It was found that Prospective teachers of Lucknow district have an average level of awareness, there is no significant difference between urban and rural trainees in their awareness level, and M.Ed. trainees have a significantly higher level of awareness than B.Ed. trainees towards Open-Source Software (OSS). The findings of this study will help fill gaps in current teacher education programs and support the systematic implementation of open-source software, thereby establishing digital self-sufficiency, cost savings, and uniform access to educational tools.

Keywords: Open-Source Software; Prospective Teachers; Teacher Education; Educational Technology; ICT.

1. Introduction

Information and Communication Technology (ICT) in education has ceased to be just a support tool. It has become a fundamental need that requires a critical appraisal of the software infrastructure on which modern pedagogy relies. Open-Source Software (OSS) has become an essential alternative to proprietary models in this digital era, providing educational institutions not only with cost-efficient solutions but also with the pedagogical freedom to share, edit, and collaborate. Nonetheless, the effective implementation of these technologies would largely depend on the awareness of Prospective Teachers who are yet to be, the gatekeepers of the classroom. The research questions aim to explore Prospective Teachers awareness of specific OSS tools across the seven functional areas defined by the Open-Source Software Awareness

Scale for Prospective Teachers (OSSAS-PT). One of the main research areas is the Learning Management System (LMS). With the growing popularity of blended learning models in schools, it is necessary to determine whether future educators are familiar with open-source systems, such as Moodle, which facilitates the management of learning materials, and other solutions, such as Open edX and the open-source version of Canvas. There is another important aspect beyond management: the ability to teach synchronously online. This paper evaluates knowledge of Virtual Classroom technologies, namely BigBlueButton and Jitsi Meet, as powerful and free alternatives to commercial video conferencing for interactive learning. In addition, the research discusses the everyday operating requirements of teachers by examining their familiarity with Office and Productivity suites, such as LibreOffice and Only Office, used for collaborative document editing and lesson planning. The study is also based on Content Creation, assessing the awareness of Gimp to edit images, Audacity to use audio resources, and OBS Studio to record online classes. Lastly, the research examines the knowledge of special Assessment (e.g., H5P, TAO Testing), Programming (e.g., Python, R), and Subject-Specific learning (e.g., GeoGebra, PhET) tools. The objectives of this study are to assess the level of awareness of Open-Source Software (OSS) among prospective teachers, compare it across urban and rural trainees, and B.Ed. and M.Ed. trainees. This study will use the OSSAS-PT to identify gaps in teacher training programs and propose incorporating these fair digital options systematically.

2. Significance of the study

This study is important in the field of education because the use of technology in the classroom largely depends on the willingness of prospective teachers, who will play the most important role in technology adoption. By analysing Prospective Teachers' awareness towards Open-Source Software (OSS), this paper shows that Teacher Education Institutions (TEIs) should place greater emphasis on OSS by revising their curricula. If Prospective Teachers are not familiar with practical options such as Moodle for learning management or BigBlueButton for virtual classrooms, schools will continue to spend money unnecessarily. In addition, this research is necessary for the career development of teachers. This paper suggests introducing more flexible and adaptable Teachers by raising awareness of various types of free software. Thus, the pedagogical impact of this study is more direct in terms of equity and access for students. When teachers are aware of subject-specific open educational resources, they can democratise access to quality teaching materials. There are no legal restrictions on sharing these tools with students for home use, unlike proprietary software, which is expensive to license for students from lower-income backgrounds. This research seeks to encourage a more interactive, participatory, and inclusive learning culture that will benefit the education community by explaining why different types of free assessment tools are important.

3. Literature review

Jagathambal & Kumar (2025) found that only 20.5% of Gen Z future teachers were aware of Open Educational Resources (OER), with no difference between Arts and Science majors, suggesting a systemic lapse in teacher education. Dutta et al. (2025) found pupil teachers of Balasore district had an average level of awareness of OER, with no significant difference between science and arts groups. Similarly, both groups showed comparable levels of OER usage, indicating consistent utilization across streams. Kayalvizhi & Shanmugam (2024) found a significant relationship between Moodle use and pre-service teachers' perception of teaching efficacy; however, fear of technology discouraged use without formal

training. Nagaiah and Thanuskodi (2023) found that most respondents reported facing challenges accessing OER due to financial constraints (29.4%), high internet access costs (20.5%), lack of training (27.9%), and lack of technical knowledge (30.5%). Nayak and Binjha (2022) found that most students were highly aware of the uses and benefits of Free and Open-Source Software (FOSS). Dsouza (2021) observed that although prospective teachers were acquainted with such platform names as SWAYAM, they were unaware of the licensing regulations (Creative Commons) and could not legally remix or share educational materials. Nayak et al. (2021) found that students were moderately aware of Free and Open-Source Software (FOSS), and the percentage of proprietary software users was higher than that of FOSS users. According to Thankachan and Moore (2017), the greatest obstacle to OSS adoption in Indian schools (Kerala) was the Lack of Support Staff, which led teachers to be anxious about technical problems despite government requirements.

4. Research Objectives

1. To assess the level of awareness towards Open-Source Software (OSS) among prospective teachers.
2. To compare the level of awareness between urban and rural trainees.
3. To compare the level of awareness between B.Ed. and M.Ed. trainees.

5. Research Questions

1. What is the level of awareness of prospective teachers towards Open Source Software?
2. Is there a significant difference in OSS awareness between urban and rural prospective teachers?
3. Is there a significant difference in OSS awareness between prospective teachers from B.Ed. and M.Ed.?

6. Hypotheses

1. **H_0:** There is no significant difference in OSS awareness between urban and rural prospective teachers.
2. **H_0:** There is no significant difference in OSS awareness between prospective teachers from B.Ed. and M.Ed.

7. Methodology

7.1. Research Design: This study employs a Descriptive Survey Method.
7.2. Population: M.Ed. and B.Ed. students enrolled in Teacher Education Institutions in Lucknow.
7.3. Sample and Sampling technique: 42 pupil teachers were conveniently selected.
7.4. Tools for Data Collection: The study utilised the self-developed Open-Source Software Awareness Scale for Prospective Teachers (OSSAS-PT) A five-point Likert scale. It had seven aspects, such as Learning Management Systems (LMS), virtual classroom solutions, office suites, content creation, digital assessment tools, programming and research, and searching for a particular topic (e.g. GeoGebra, PhET).
7.5. Data Collection Methods: Data was collected via Google Forms distributed through email and a WhatsApp group.

8. Data Analysis

Objectively analysed the collected data by using a suitable statistical method-

8.1. To assess the level of awareness towards Open-Source Software (OSS) among prospective teachers.

Table 1: Overall level of awareness towards Open-Source Software (OSS)

Variable	N	Mean	SD	Standard Error of Mean	Confidence Interval (Mean)	Level of Awareness
OSS Awareness level	42	102.67	21.96	3.38	94.05 - 111.29	Average

Interpretation: The Open-Source Software awareness level mean value among prospective teachers ranges from 94.05 to 111.29. It will occur 95 times out of 100; we can say there is a 5% chance of going beyond the 94.05 to 111.29 limits.

Finding: Prospective Teachers have an average level of awareness of open-source software.

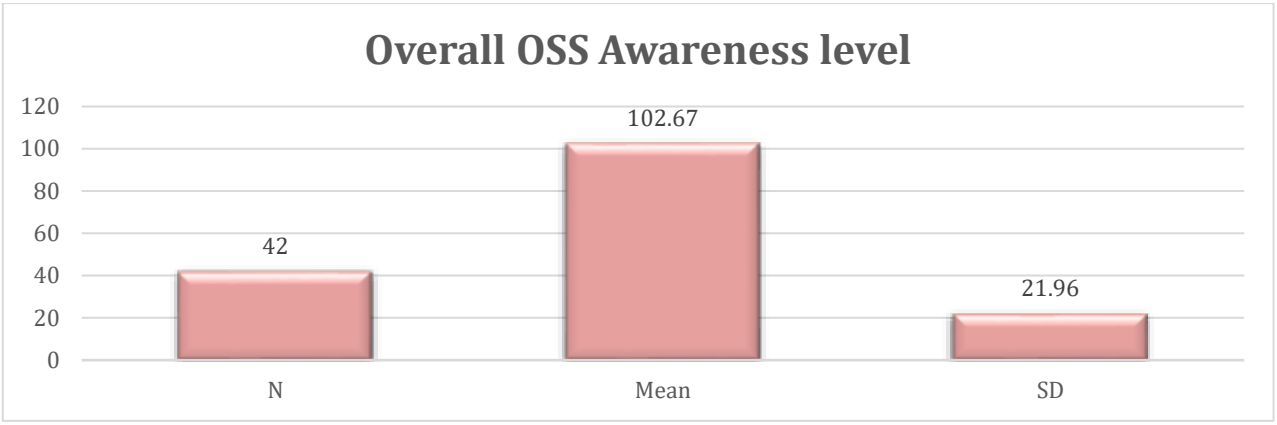

Figure 1: Overall OSS Awareness level of Prospective Teachers.

Table 2: Level of awareness towards Open-Source Software (OSS) by percentages

Level of Awareness	Score Range	N	Percentages
High	111 - 150	14	33.3
Average	71 - 110	25	59.5
Low	30 - 70	3	7.1
Total		42	100

Interpretation: By the observation of Table 2, it was found that awareness of Prospective Teachers towards Open-Source Software (OSS) among the majority, 59.5% of trainees, has an average level of awareness that mean score that lies between 71 to 110. It found that 33.3% prospective teachers have a high level of awareness, that mean score that lies between 111 to 150. It also found that 7.1% prospective teachers have a low level of awareness, that mean score that lies between 30 to 70.

Finding: It reveals that Prospective Teachers have an average level of awareness towards open-source software. And 59.5% of trainees have an average level of awareness, 33.3% have a high level, and 7.1% have a low level of awareness towards open source software.

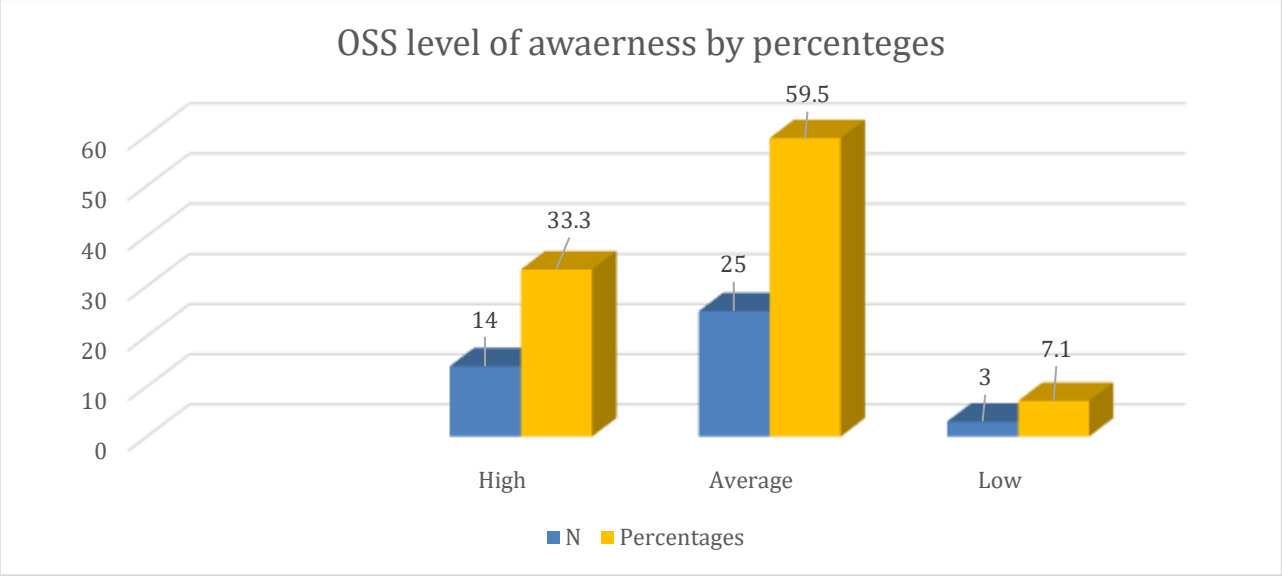

Figure 2: Percentage distribution of Prospective Teachers towards OSS.

8.2. To compare the level of awareness between urban and rural trainees.

Table 3: Urban-Rural comparison level of awareness towards Open-Source Software (OSS)

Group	N	Mean	SD	Calculated t-value	df	t-table value (0.05 level)	result
Urban	19	105	23.13	0.61	40	2.02	Not Significant
Rural	23	100.74	21.27				

Interpretation: The mean scores for Urban and Rural trainees were 105 & 100.74, with SD of 23.13 & 21.27, respectively. Calculated 't' value is 0.61, between the difference between the Rural and Urban trainees with respect to awareness towards Open-Source Software (OSS). Cal 't' value is less than the table 't' value at 0.05 levels of significance (where, df is 40, 2.02 at 0.05 level). It shows that there is no significant difference between urban and rural trainees in their awareness of Open-Source Software (OSS).

Finding: It is found that there is no significant difference between urban and rural trainees in their awareness of Open-Source Software (OSS).

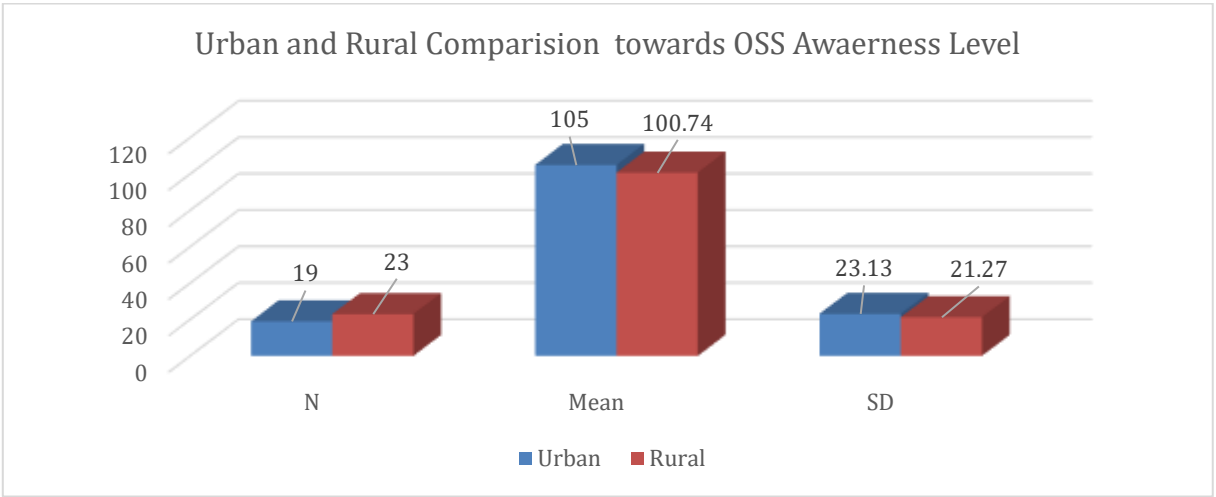

Figure 2: Urban-Rural comparison level of awareness towards Open-Source Software (OSS).

8.3. To compare the level of awareness between B.Ed. and M.Ed. trainees.

Table 4: B.Ed. and M.Ed. comparison level of awareness towards Open-Source Software (OSS)

Group	N	Mean	SD	Calculated t-value	df	t-table value (0.05 level)	result
B.Ed	17	93.94	25.83	2.17	40	2.02	Significant
M.Ed	25	109.21	16.19				

Interpretation: The mean scores of B.Ed. and M.Ed. trainees were 93.94 & 109.21, with the SD scores of 25.83 & 16.19, respectively. Calculated 't' value is 2.17, between the B.Ed. and M.Ed. trainees with respect to awareness towards Open-Source Software (OSS). Calculated 't' value is greater than the table 't' value at 0.05 levels of significance (where, df is 40, 2.02 at 0.05 level).

Finding: It shows that there is a significant difference exists between the B.Ed. and M.Ed. trainees in respect to their awareness towards Open-Source Software (OSS). Based on the mean score, M.Ed. trainees have a significantly higher level of awareness than B.Ed. trainees.

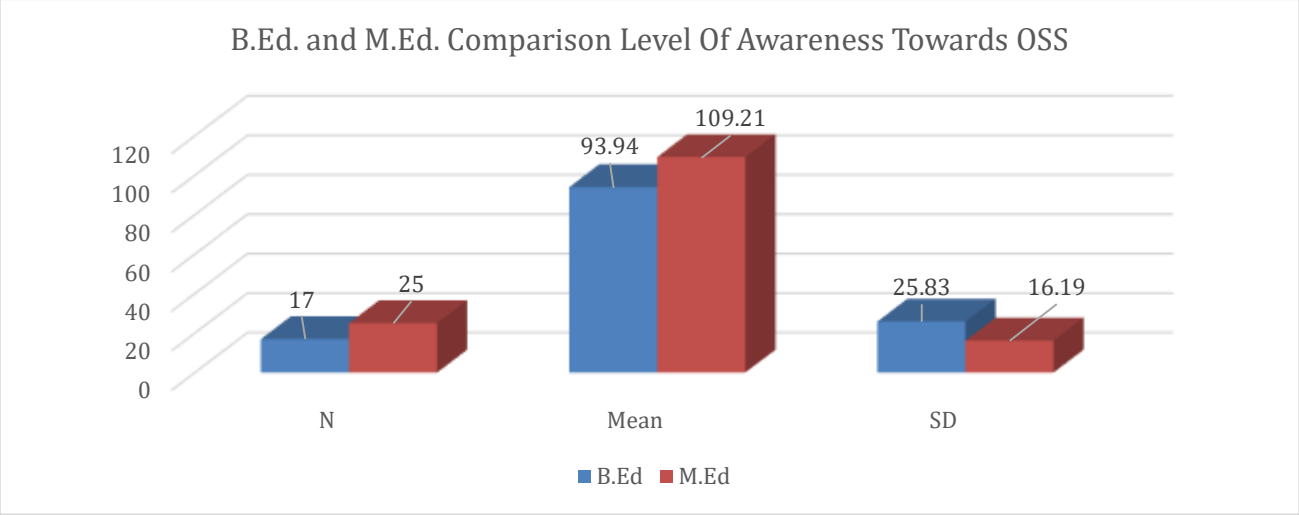

Figure 3: B.Ed. and M.Ed. comparison level of awareness towards OSS

9. Major Findings

1. Prospective teachers of Lucknow district have an average level of awareness towards Open-Source Software (OSS).
2. Geographical location, such as Urban and Rural, does not significantly influence the awareness level of trainees towards Open-Source Software.
3. Academic qualification can significantly influence the level of awareness of Prospectives Teacher. M.Ed. trainees show a higher level of awareness than B.Ed. trainees. It means that trainees with higher levels of academic qualification have greater awareness of OSS.

10. Discussion

This study investigated Prospective Teachers' awareness towards Open-Source Software (OSS) and whether awareness differed across the two factors of locality and academic qualification. The research results are valuable for understanding the state of OSS awareness among teacher trainees. To begin with, the research has found that the level of awareness among Prospective Teachers regarding Open-Source Software is moderate. The responses were distributed as follows: 59.5% of the trainees are in the average

category, 33.3 % are in the high level of awareness category, and 7.1 % are in the low level of awareness category.

This finding indicates that a significant percentage of teacher trainees are familiar with OSS, but their knowledge and understanding are not yet advanced. The majority of trainees' average levels may reflect that many Prospective Teachers are exposed to open-source software in some way during their training or through digital gadgets and tools, but lack conceptual knowledge or practical use. Given the growing interest in digital resources and technology integration in the educational process, and the corresponding focus of the new National Education Policy 2020, the average level of awareness indicates that more organised training and orientation programmes for OSS in Teacher Education Institutions will be necessary.

This study found no difference between urban and rural Prospective Teachers' awareness towards Open-Source Software. It suggests that the locality may not significantly influence the level of Prospective Teachers awareness towards OSS. It indicates that the availability of digital tools and internet access is present in both urban and rural areas. With online learning opportunities, smartphones, and digital infrastructure development, the digital divide between urban and rural trainees in access to information is slowly becoming less significant. Consequently, both urban and rural Prospective Teachers have opportunities to know about and use open educational resources.

This finding also indicates that teacher education programmes provide fairly equal access to digital resources regardless of location. It was also found that there was a significant difference between B.Ed. and M.Ed. trainees, with M.Ed. trainees showing a higher level of awareness towards Open-Source Software. This result can be explained by the high level of academic exposure and research focus associated with the M.Ed. programme. Students in M.Ed. usually participate more in educational technology, research methods and online resources in the course of their study. These institutions can make them more familiar with open-source software, digital learning, and collaboration tools. B.Ed. trainees, on the contrary, can pay more attention to pedagogical practices and classroom teaching skills, which would restrict access to more advanced technological resources unless it is explicitly stressed in the curriculum.

The research results reveal that despite an average awareness of prospective teachers on OSS, there is still an opportunity to make a significant advancement. The use of structured training, workshops and practical activities associated with open-source software should be taken into account by teacher education institutions in the curriculum. These programs can contribute to improving digital competency among the Prospective Teachers and promote the good utilization of the technological means that are free to use in teaching and learning. The enhancement of awareness and use of OSS can also help to enhance cost-effective, innovative, and collaborative educational practices in the modern digital learning environment.

Conclusion

The current study aimed to assess the awareness level of Prospective Teachers towards Open-Source Software (OSS) and compare the awareness level of trainees with respect to geographical location (urban and rural) and academic qualification (B.Ed. and M.Ed.). This study found the awareness of Prospective Teachers towards Open-Source Software (OSS). The results show that most Prospective Teachers have an average level of awareness, meaning that though they are relatively aware of OSS, they have little knowledge and experience. A smaller percentage of trainees revealed high-level awareness, but very few revealed low-level awareness. It means that the awareness of OSS is present among the Prospective

Teachers, but needs to be reinforced further by systematic academic and practical interaction. The research also found there were no significant differences in urban and rural Prospective Teachers, which suggests that the notion of locality is not a significant factor in the determination of awareness of open-source technologies. Nevertheless, a substantial difference was found between B.Ed. and M.Ed trainees, and M.Ed. trainees were more aware of OSS. Thus, this study argues that Open-Source Software awareness and training should be integrated in the teacher education programmes in order to ensure Prospective Teachers have the opportunity to make proper use of free and adaptable digital tools in teaching and learning. Enhancing such awareness is also aligned with the vision of the National Education Policy 2020, which focuses on the role of technology in education and the making of digitally competent teachers.

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