



# Free and Open Source Software (FOSS): Students Awareness and Adoption in Higher Education

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## **Abstract**

*The present study was conducted with the aims to study the awareness and adoption of students about Free and Open Source Software at higher education level in Odisha and to study the factors influencing the awareness and adoption of students about Free and Open Source Software. Two hundred students from Ravenshaw University, Uikal University and Ramadevi Women's University of Odisha have been taken as the sample of the study by using purposive sampling technique. In this study, Descriptive survey design was adopted and the relevant data were collected from the respondents by using questionnaire. The collected data has been analyzed using descriptive statistical technique. The findings of the study revealed that students are moderately aware with Free and Open Source Software (FOSS) and percentages of proprietary software user are comparatively higher than to FOSS user. However, the major factors responsible for FOSS awareness and adoption is lack of information, lack of awareness among students; moreover, lack of institutional support and lack of training on FOSS usage is also a major factor for adoption. The study suggested that research community, educational institution, teacher educators, policy makers and curriculum developers should take initiative to encourage the students to use different types of Free and Open Source Software (FOSS).*

**Keywords:** Free and Open Source Software (FOSS), Awareness, Adoption and Higher Education

## 1.0. INTRODUCTION

Education is most important factor for the development of a country. We should make it appropriate according to the time and changing scenario of the world. Education provides an opportunity to reflect upon the social, economic, cultural, and moral issues facing by a human being. India needs to focus on education for more educated and efficient people to drive our nation in order to develop the country we have to strengthen our higher education system. The new information communication technology (ICT) has expanded its outreach through the Internet. Therefore, the vision is to electronically reach out a large number of students, teachers, and the general public with the quality educational material, so as to address the issues of access to higher education with equity and quality (Giri & Sengar, 2011). Integration of technology in education is not only supporting to achieve the national goal but also help increase accessibility of quality education. In our country the higher education institution is facing challenges related to better delivery of education, ensuring quality of education to all, skilled and trained faculty, and research and innovation. Realizing the potential of information and communication technology, it can be better utilized by the teaching-learning community. For this awareness and adoption of technology is very much essential. Much academic research show concerns on lack of technological awareness and its mixing with pedagogy and content. As a result of it becomes a challenge for the educational community to integrate technology in education.

### **Free and open-source software (FOSS)**

Now a day the development and innovation of Information and communication technology (ICT) gives rise to new opportunities for learning, better ways of studying and engaged in easy accessibility with cost reduction. Educational institutions have been using modern technologies with effective use of the internet to expand and distribute education to students. Adoption of technologies in institutional as well as an individual level is facilitating the learning community to learn from everywhere and everyone. But, the most concerning challenges is availability of appropriate software technology and its usability. The concept and practice of open source is making source code openly available. The very general concept of FOSS is allowing the source code of software publicly available to everyone to use it (Shaame, Shanmugan and Dehghantanah, 2013). The free and open source movement aims to break the barriers of proprietary software and to encourage and enable free sharing and distribution of software for serving the community (Shaame, 2014). Free and Open Source Software (FOSS) is software in which anyone can freely licensed to use, copy, study, and change the software in any way, and the source code is openly shared so that people are encouraged to voluntarily improve the design of the software. Free and Open Source Software (FOSS) is software that can be classified as both free software and open-source software. That is, anyone is freely licensed to use, copy, study, and change the software in any way, and the source code is openly shared so that people are encouraged to voluntarily improve the design of the software. This is in contrast to proprietary software, where the software is under restrictive copyright and the source code is usually hidden from the users. FOSS has an evident impact on education and has already produced highly successful tools related to education, such as Course Management Systems (CMS)

e.g., MOODLE, web portal and media wiki which is a known as a popular source of materials for students and teachers. In addition, major FOSS distributions, such as the education version of UBUNTU (EDUBUNTU) specialize in education is a great choice for the computing needs of students, teachers and schools (Shaame, 2014).

### **Objectives of the Study**

1. To study the awareness of students about Free and Open Source Software at higher education level in Odisha.
2. To study the factors influencing the awareness of students about Free and Open Source Software.
3. To study the adoption of Free and Open Source Software by students at higher education level in Odisha.
4. To study the factors influencing the adoption of Free and Open Source Software.

### **2.0. METHODOLOGY OF THE STUDY**

This study aims at investigating the students' awareness and adoption of Free and Open Source Software in higher education. It seeks the views of higher education students with reference to their familiarity level and adoption of Free and Open Source Software. Therefore, Descriptive Survey Design was adopted to conduct this study. The population of the study comprised the students of higher education institution of Odisha. In this study, 70 students from Ravenshaw, Utkal University and 60 students from Ramadevi University were selected as the sample of the study by using purposive sampling technique. For the purpose of data collection semi structured questionnaire was employed to collect the from students. It includes two sections containing questions items and answer options. It also includes both multiple choice and Yes/No type items. Section A of the questionnaire included questions and statements to study the students awareness about Free and Open Source Software (FOSS). In the other hand Section B of the questionnaire included questions to study the adoption of FOSS by the students. In order to fulfill the objectives of the study, the investigator analyzed the questionnaire by finding out the percentage and frequency of responses of respondents.

### **3.0. FINDINGS OF THE STUDY**

After analysis and interpretation, the present study found some of the major findings which are given below.

#### **Awareness of students about Free and Open Source Software (FOSS)**

1. In terms of awareness on FOSS, it has been found that about 58 percent of university students were well aware of FOSS. About 53 percent of university student using both proprietary and Free and Open Source Software (FOSS).
2. According to the results, 46.25 percent of the students were unaware about pirated software. They don't have any idea that the software they are using pirated or not. About 66.25 percent of students were highly aware of the usage and benefits of Free and Open Source Software (FOSS).

3. In terms of awareness on feature of FOSS, 38.75 percent were found to be aware of *freedom to use*, feature which is highest in number while 27.5 percent were aware of *available with source code*, and nearly 26.25 percent were responded to *freedom to modify*. It reveals that students majority of the students were unaware with different feature of Free and Open Source Software (FOSS). The findings indicates that majority of the students were unaware about open source movement.
4. Majority of students about 82.5 percent like to know about Free and Open Source Software (FOSS). FOSS as alternative software, cost free, virus free, and user friendly were some of the reason for their willingness to know about Free and Open Source Software (FOSS).
5. Majority of student about 58.75 percent shown their understanding about FOSS is *distributed freely to anyone interested*. The results also shows that majority of the students were unaware about other features of FOSS like it allows users *to access to the programme source code* and *the user can modify the source code* etc.
6. The result indicates that 50 percent of the students were slightly aware of Free and Open Source Software (FOSS). Here, it can be concluded that half of the students were slightly aware about Free and open source software (FOSS) and very few students are highly involve in FOSS programme. According to 16.25 percent of students, there were piracy risks in the use of FOSS. In the other hand 50 percent of the students are not sure about piracy risk in the use of FOSS. It shows that these students are not aware about FOSS because there is no piracy risk in the use of FOSS. The result shows that most usable operating system is Microsoft Windows. About 87.50 percent of students were using Microsoft Windows frequently. In comparison to FOSS operating system, students' were using Microsoft Windows frequently.
7. The result shows that majority of the students were unaware about security of software and students have the wrong idea that Microsoft Windows is more secure than FOSS operating system. The findings indicate that Microsoft office is highly aware by the students in comparison to other office suites. About 82.50 percent of students were aware with VLC media player which is a Free and Open Source Software (FOSS). But only 2.5 percent of students were familiar with another FOSS media player that is Miro. According to the findings of the study, very few students were using FOSS office suites. But among all the FOSS office suites majorly 32.5 percent of students were using open office.

### **Factors influencing the awareness about Free and Open Source Software (FOSS)**

1. The finding reveals that internet/social media, course syllabus and conference/seminar are the major factors influencing the awareness of students about Free and Open Source Software.

## Adoption of Free and Open Source Software

1. Findings of the study also indicates that percentages of proprietary software user were comparatively higher than to FOSS user. About 15 percent of students were adopted Free and Open Source Software (FOSS) in their daily work. From the results of the study it can be concluded that majority of the students believes Free and Open Source Software (FOSS) is easy to use.
2. From the results of the study the researcher observed that majorly 82 percent of students were adopted Proprietary software like; MS Windows, 75 percent of the students were adopted Microsoft office, 71 percent of students adopted windows media player and 67.5 percent of students adopted to internet explorer. So, it can be concluded that majority of the students were adopted with different proprietary software like MS Windows, Internet explorer, Microsoft Office, Adobe Photoshop and Windows Media Player software.
3. The researcher observed that majorly 80 percent of students were adopted VLC media player and 65 percent of students were adopted to Mozilla Firefox web browser. So, it indicates majority of the students were adopted with FOSS tools like Mozilla Firefox and VLC media player only.
4. It reveals that majorly 81 percent of students were not adopted to educational Free and Open Source Software like; Edubuntu, LibreCad, FreeCad. About 78 percent of students were not adopted to Sakai, while about 77 percent of students were not adopted to GIMP, and nearly 76 percent of students not adopted to Moodle and Miro FOSS tool.

## Factors influencing the Adoption of Free and Open Source Software (FOSS)

1. About 56.25 percent of students were using FOSS tool because of features like *freedom to use for any purpose*. While 38.75 percent of students were using FOSS because these software gives *freedom to modify* and *freedom to share or distribute*. In the other hand very few students were responded to *publicly availability*, Institutional support, Government support and Prescribed in curriculum are the reason for adopting Free and Open Source Software.
2. The result shows that lack of awareness and lack of information is a major factor for FOSS adoption. While some of the respondent agreed lack of institutional support and lack of training on use of FOSS tool are major factor for FOSS adoption.

## 4.0. CONCLUSION

From the above result and discussion, it can be concluded that FOSS has the potential to deliver considerable benefits for educational institutions. For example, for data analysis we are using SPSS software which requires more cost to buy, but PSPP software is alternative of SPSS available with same feature which is free of cost and no such copy right issue is there. So like PSPP many FOSS software are available which can be used in educational purposes. But lack of awareness about the uses and benefits of free and open source software is a large factor towards less use of free and open source software. According to the students (those are using



FOSS) Free and Open Source Software (FOSS) as alternative software which are cost free, virus free, and user friendly. So more initiatives should be taken to integrate FOSS in education. Now Odisha government distributing the free laptop to the meritorious students with pre-installed FOSS software (UBUNTU).

## 5.0. RECOMMENDATIONS

After the findings of the present research, it has been realized the important and need of Free and Open Source Software (FOSS) in higher education. Following further implication can be made.

### Research community

FOSS is a very useful software tools which can be used for educational purposes like research, teaching-learning, data gathering, interpretation, representation etc. The FOSS tools are alternative to proprietary software. So the study would help the research community to conduct further research in this area.

### Educational institution

The study found that lack of institutional support is one of the important causes for FOSS adoption. So the educational institution should encourage and take initiative to use FOSS for educational purposes.

### Teacher educators

The study would also help the teacher educators to train the pupil teachers so that he/she can use different type of Free and Open Source Software in education.

### Policy makers

The study would help the policy makers must care of this area and come up with policy related to ICT. The policy makers also make more research in this area because it cannot be ignore to develop quality in higher education.

### Curriculum developers

The study would help to the curriculum developers to re-evaluate and re-frame the curriculum of higher education giving attention to this area.

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