

**KNOWLEDGE AND UTILIZATION OF FREE OPEN SOURCE SOFTWARE
AMONG INFORMATION TECHNOLOGY EDUCATORS IN REGION 02:
PROPOSED FREE OPEN SOURCE SOFTWARE TRAINING PROGRAM**

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ABSTRACT

This descriptive study aimed to assess the extent of knowledge and utilization on free open source software (FOSS) among the IT Educators of Region 02. The researcher used a questionnaire to gather the needed data supplemented by an informal interview to elicit the schools' best practices and IT administrators' support mechanisms on teachers' use of FOSS. Data obtained were analyzed using descriptive and inferential statistics and the results served as bases for the design of a Proposed Training Program for Teachers on the Use of Open Source Software.

The study revealed the following results: 1) IT educators using FOSS perceived that teaching IT subjects becomes more interesting for students and learning is better enhanced. 2) IT educators either from CHED recognized Centers of Development for IT Education or Autonomous institutions are more knowledgeable or more frequent users of FOSS 3) IT educators possess inadequate knowledge and erroneous notions about FOSS.

Keywords: *free open source software, IT education, software, IT instruction*

Introduction

The rapid advances in information technology (IT) has immensely affected and altered the educational landscape. Learners as well as educators have greatly utilized the innovations in information technology to significantly enhance the teaching and learning process. With IT infrastructures permeating all facets of education, learning is no longer confined within the four walls of the classroom but it now has gone beyond it making access to education possibly borderless.

Teachers from basic to post graduate education are pushed against the wall to keep themselves abreast with the fast pace of technological advancements. They simply can no longer afford to provide their learners with conventional teaching strategies using the chalk-talk or the boring classroom lecture approach but they are now compelled to employ varied educational technologies to prepare their students to the demands and needs of the 21st century learning skills. Teachers now are then motivated to attend faculty development trainings that will primarily enable them to effectively use more advanced educational technologies such as desktop computers, laptops, netbooks, ipods and a lot more to strengthen students' participation and learning engagement.

With the use of advanced educational technologies, a significant number of educators now teach students virtually using available learning management system (LMS) platforms and software. Most LMS platforms and software are though expensive to maintain for both school administrators and teachers delivering their instruction using them. However, some of these are readily available and are free of use without the teacher and the school administrators to worry over license and copyright infringement. These are called sharewares or more commonly called as free and open source software (FOSS). A good example of this is the Moodle, a learning management system platform or a virtual learning environment (VLE). As of October 2010, Moodle had a user base of 49,952 registered and verified sites, serving 37 million users in 3.7 million courses (<http://en.wikipedia.org/wiki/Moodle> Accessed October 31, 2011) used by educators all over the world.

The emergence of FOSS in the World Wide Web had dramatically helped millions of educators worldwide in reducing the cost of teaching and learning. A lot of open source software are readily accessible in certain websites that advocate the principle of sharing and collaboration.

Sourceforge.net is an example of a site that offers a myriad of open source software that can be used freely by anyone not only in the area of education but in other disciplines as well such as business enterprise, science and engineering, games, graphics and a lot more.

With FOSS, a lot of educators in higher education institutions (HEIs) particularly those offering information communications technology related courses are immensely benefited. This is so because open-source software, being free, can now be used by IT educators and practitioners in the practice of their profession without having to worry on spending on high cost of licensing and maintenance. IT educators and students can now freely access the source codes of a lot of open-source software and improve and customized them according to their intended needs.

The emergence of FOSS is however relatively new. The researcher believes that only a few IT practitioners and educators utilized available open-source software either because of the interplay of a lot of factors and reasons. Some think many open-source software are unreliable and not user-friendly. Others suspect that they are prone to virus attack and thus belittle their quality. The researcher believes that FOSS are under-utilized. It is in this light that the researcher intends to find out the extent to which open-source software are used by IT educators in Region 02 as well as to assess their knowledge of it and the problems that they have encountered with the use of open-source software.

Statement of the Problem

The study aimed to assess the extent of knowledge and the use of open source software among the IT Educators in Region 02.

Specifically it sought to answer the following:

1. What is the profile of the higher education institution in terms of:
 - 1.1 Type of Institution,
 - 1.2 CHED recognition as COD/Autonomous and
 - 1.3 Years of operation of the IT program?

2. What is the profile of the respondents in terms of the following:
 - 2.1 Nature of work,
 - 2.2 Gender,
 - 2.3 Age,
 - 2.4 Highest educational attainment and
 - 2.5 Number of years as IT educator/administrator?

3. What is the respondents' extent of use of the open source software in their professional practice as IT educators?
4. To what extent do the IT administrator respondents support the use of FOSS by their teachers in their institution?
5. Is there a significant difference on the respondents' extent of use of the open source software in their professional practice as IT educators when grouped according to profile variables?
6. Is there a significant difference on the school's extent of use of the open source software when grouped according to institutional profile?
7. What are the respondent's ideas and beliefs regarding free open source software?
8. What is the respondent's level of knowledge about free open source software classification?
9. Is there a significant difference on the respondents' level of knowledge about open source software classification when they are grouped according to profile variables?
10. What enhancement program can be developed to strengthen the IT educators' knowledge and extent of use of open source software in their professional practice?

Methods

Research Design

This study made use of the descriptive survey to assess, describe and compare the respondents' extent of use, ideas and beliefs, knowledge level on open source software.

Respondents of the Study

The IT educators in the different Higher Education Institutions in Region 02 are the respondents of the study.

Table A shows the frequency and percentage distribution of the respondents from the different HEIs of Region 02.

Table A

Frequency and Percentage distribution of Respondents According to Higher Education Institution Employees

Name of Institution	Frequency	Percentage
Aldersgate College	10	5.43
AMA Computer College Santiago	3	1.63
AMA Computer College Tuguegarao	6	3.26
Batanes State College	1	.54
Cagayan State University - Aparri	6	3.26
Cagayan State University – Piat	2	1.09
Cagayan State University Carig	17	9.24
Cagayan State University Sanchez Mira	9	4.89
Cagayan valley Computer & Info Tech College	3	1.63
Florencio L. Vargas College	7	3.80
HGB College	3	1.63
International School of Asia and the Pacific	5	2.72
Isabela State University - Ilagan	12	6.52
Isabela State University Cauayan	16	8.70
Isabela State University Echague	3	1.63
Lyceum of Aparri	3	1.63
Northeastern College	4	2.17
Nueva Vizcaya State University	9	4.89
Patria Sable Corpus College	3	1.63
PLT College Nueva Vizcaya	6	3.26
Quirino Polytechnic College	4	2.17
Saint Ferdinand College	5	2.72
Saint Joseph College – Baggao	2	1.09
Saint Mary's University	8	4.35
St. Paul University Philippines	6	3.26
STI College Santiago	6	3.26
University of Cagayan Valley	6	3.26
University of La Salette	6	3.26
University of Perpetual Help	4	2.17
University of St. Louis	9	4.89
Total	184	100.00

Instrumentation

The researcher made use of a researcher-prepared questionnaire to gather the needed data. It is a questionnaire composed of 4 parts. Part I covers the profile of the institution, Part II on respondents' profile, Part III on knowledge and use of open source software, Part IV on ideas and beliefs on Free Open Source Software.

The questionnaire was tried out and was subjected to validation procedure to ensure its validity and reliability.

To supplement the data gathered for the questionnaire, an informal interview was also done to elicit best practices on the use of FOSS and support by IT administrators for its use by their teachers.

Data Gathering Procedure

The data collection involves the floating of questionnaires. The researcher sought permission and approval from the different HEI administrators in Region 02 through personal delivery of the letter of permission for the conduct of the study.

After approval to conduct the study was obtained, the researcher personally administered the research instruments to the different IT educators who were chosen as respondents of this study in order to answer questions and address clarifications regarding the questionnaire in case there are.

The researcher also employed the use of informal interview to supplement and cross validate the respondents' answers to the questionnaire and derive other data focusing on best practices and FOSS support by the administrators.

After all questionnaires are retrieved from the respondents, the data was electronically tallied and analyzed using SPSS, a data analysis software.

Data Analysis

The following statistical tools were employed in the treatment of the data.

1. **Frequency and percentage.** This was used to obtain the respondents' profile and respondents' ideas and beliefs on open source software.
2. **Mean.** This was used to obtain the respondents' extent of use on open source software. To interpret the means, the given arbitrary scale was used.

Mean Range	Verbal Interpretation
2.25 – 3.00	Always
1.50 – 2.24	Sometimes
0.75 – 1.49	Rarely
0.00 - 0.74	Never

3. **T-test for Independent Samples and One-Way Analysis of Variances (ANOVA).** These were used to test the significant difference on the respondents' extent of use and knowledge of the open source software in their professional practice as IT educators when grouped according to institutional and profile variables.

Results and Discussion

1. Institutional Profile

1.1 Type of School

Majority of the respondent-schools are private higher education institutions.

1.2 CHED Recognition

Majority of the respondent-schools are either non-CODs or non-autonomous schools.

1.3 Length of Operation

Most of the respondent-schools have been operating the Information Technology or Computer Science programs for 10 – 14 years.

2. Profile of the Respondents

2.1 Nature of Work

Majority of the respondents are fulltime classroom teachers.

2.2 Gender

Majority of the respondents are male.

2.3 Age

Most of the respondents belong to age range 21 – 25 years.

2.4 Highest Educational Attainment

Most of the respondents have earned units in their Master's education.

2.5 Number of Years as IT Educator

Most of the respondents have been in the IT profession as educator for 5 – 6 years.

3. Respondents' Extent of Use of the Open Source Software in Their Professional Practice as IT Educators

Majority of the respondents use the open source software in the practice of their profession but generally use the software "rarely".

4. IT Administrator-Respondents' Extent of Support for the Use of the Open Source Software by Their Teachers in their Institution

Majority of the respondents' heads of the IT program are not supportive of the use of the free and open source software by their teachers.

5. Test for Significant Difference in the Respondents' Extent of Use of the Open Source Software in their Professional Practice as IT Educators when Grouped According to Profile Variables

There is no significant difference in the respondents' extent of use of the open source software when they are grouped according to:

- nature of work
- gender
- age
- highest educational attainment
- number of years as IT educator/administrator.

6. Test for Significant Difference in the Respondents' Extent of Use of the Open Source Software in their Professional Practice as IT Educators when Grouped According to Institutional Profile

There is no significant difference in the respondents' extent of use of the open source software when they are grouped according to CHED recognition as COD or autonomous institution. However, the respondents' extent of use of the open source software is significantly higher for respondents who teach in the public HEI and for respondents who teach in the institution offering the Information Technology/Computer Science program already for a longer period of time.

7. Respondents Ideas and Beliefs Regarding Open Source Software

Most of the respondents have erroneous beliefs about FOSS.

8. Respondents' Level of Knowledge about Open Source Software Classification

Majority of the respondents were able to correctly classify only about less than 5 open source software out of the 31 identified FOSS. The respondents' scores range from 0 to 17.

9. Test for Significant Difference in the Respondents' Extent of Knowledge of the Open Source Software Classification when Grouped According to Profile Variables

There is no significant difference in the respondents' extent of knowledge of the open source software when they are grouped according to:

- nature of work
- gender
- age
- highest educational attainment
- number of years as IT educator/administrator.

10. Test for Significant Difference in the Respondents' Extent of Knowledge of the Open Source Software Classification when Grouped According to Institutional Profile

There is no significant difference in the respondents' extent of knowledge of the open source software classification when they are grouped according to type of school. However, the respondents' extent of knowledge of the open source software classification is significantly higher for respondents who teach in either a COD or autonomous institutions and for respondents who teach in institutions offering the Information Technology/Computer Science program already for a longer period of time.

Conclusions

Based on the summary of findings, the following conclusions are arrived at:

Educators and administrators in the Information Technology or Computer Science programs in the different higher education institutions in Region 02 generally are users of the open source software in the practice of their profession. It is however sad to note that its use is not optimized considering that these software are readily available and costless. Teaching IT subjects certainly becomes more interesting for students and learning is better enhanced when high quality open source software are used to supplement the licensed software that are normally used to teach certain subjects.

The IT educators' poor knowledge about open source classification necessitates further strengthening with respect to their awareness of use. IT educators need to dispel their erroneous notions of open source software in the teaching of their subjects so they can effectively impart their knowledge about FOSS and to ensure maximum engagement of students to participate in scholarly discussions about open source software.

Educators who are connected with institutions that are recognized by CHED as Center of Development for IT Education or recognized as Autonomous institutions are either more knowledgeable with open source software or are more frequent users of FOSS. Being affiliated with prestigious institutions, they really should be the foremost advocates of

FOSS to afford their students with a wider array of learning focus and avenues.

Recommendations

In the light of the findings and the conclusions reached, the researcher hereby recommends the following:

- 1) That Higher Education Institutions in Region 02 offering IT curricular programs should intensify their promotions and advocacy of the use of open source software.
- 2) That IT educators in Region 02 should enrich their knowledge and skills in the use of open source software so they can effectively and optimally use its capabilities and unique attributes.
- 3) That the Commission on Higher Education through its COD and autonomously recognized HEIs conduct orientation, capability building activities and seminars and trainings on open source software as regards their capability and use in enriching classroom instruction.
- 4) The PSITE Region 02 in collaboration with CHED and HEIs recognized as CODs, specifically St. Paul University Philippines' School of Information Technology and Engineering implement the proposed enhancement training of this study.
- 5) That IT administrators of IT programs should strengthen their support for the use of open source software among their faculty and students to provide them with a wider array of options to lead and learn IT concepts and topics with greater breadth and depth.
- 6) That COD recognized HEIs in Region 02 be more aggressive in the use of FOSS and be the primary strong advocates of FOSS in the Region.
- 7) That more studies and researches focusing on the other facets of FOSS be conducted among non-IT educators and practitioners as well as students in the tertiary level.

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