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The Impact of Free and Open Source Software (FOSS) on Student Success

Goal

The main objective of this project is to promote Free and Open Source Software (FOSS) at PBCC in order to achieve the following goals:

1. To improve students success by providing students with leading edge software needed to best meet academic, career and personal improvement goals
2. To incorporate the latest technology in the area of software in classroom and interdisciplinary curriculums such as CIS, English, Summer Youth College and Learning Unlimited.
3. To decrease student and college spending on software and texts, this will release financial resources.
4. To more easily bridge the linguistic and technological gaps in students' education, thereby increasing communication and easing the transition from one culture to another.

Project Background

The inception of this project came to my mind in spring of 2005 as part of an honor's project for CGS1570: Microcomputer Application. Since my technical background is in programming, I was always fascinated with the concept of Open Source Software, which is basically unconditional access to the code of software. After considerable investigation, I realized that Free and Open Source Software (FOSS) is a leading driver in advancing commonly used software, such as Microsoft Word, PowerPoint, Publisher, Excel and Access, as well as other software such as Macromedia Dreamweaver. Therefore, I suggested an honor's project on Openoffice.org which is an office suite very similar to Microsoft Office. I also supervised several honor's projects concerning Free and Open Source Software (FOSS) afterward my initial investigation.

I conducted a presentation on "Free and Open Source Office Suite for Everyone: Openoffice.org" in Technology Conference: Dreams & Inventors in April 2006. The conference was held by the School District of Palm Beach County. This presentation was created by the Computer Club – South which I have been supervising for over a year. Also, our Computer Club – South offered two courses: Multimedia Mania and Tux Paint for Kids for Summer Youth College in July 2006.

Presently, I would like to take the idea of using FOSS as a technological tool to improve students' success at PBCC to a higher level

Defining Free and Open Source Software (FOSS)

Any software is a collection of programs that are implemented in different sort of programming language which could be in thousands of lines of codes. Open Source, as opposed to proprietary software, provides code which is available for viewing, modification, improvements and “bug-fixing.” As a result the code being open to view and modification, the software evolves rapidly and constantly to higher and higher level of quality. The table 1 shows differences between FOSS and proprietary software in the context of our interests for this proposal.

Table 1: Comparison between FOSS and proprietary software¹

	FOSS	Proprietary
1	Access to source code	No access to source code
2	Software can be improved or fixed by anyone	Software can be improved or fixed by the vendor
3	License cost is virtually zero.	License cost varies
4	Free distribution is allowed	Free distribution is illegal
5	Business model is based on providing services rather than selling license and service	Business model is based on selling license and service
6	Participant (Have a voice)	End user (right to use the software)
7	Community (developer, distributor, participant)	Vendor/Customer relationship

Benefits of Using Free and Open Source Software (FOSS)

The most important reasons for using FOSS for the purpose of this study are as follows:

1. Free software
2. Free distribution
3. Participant (not end user)
4. Community

Points 1 and 2 above together will result in substantial financial benefits and can be multiplied by each redistribution, all of which is free and legal. For more information on typical savings refer to table 2.

Table 2: Typical savings²

	FOSS	Proprietary software	Typical saving (Academic edition)
1	Openoffice.org	Microsoft Office	\$ 200
2	PDF Creator	Adobe PDF	\$ 160
3	Nvu	Microsoft FrontPage, Macromedia Dreamweaver	\$ 100 \$ 300
4	Gimp	Adobe Photoshop	\$300

¹ Free/Open Source Software and the Digital Divide; 22nd Chaos Communication Congress – Berlin, Dec. 2005, Meike Richter

² Efollett.com: Student Software Discount Flyer (Appendix)

The points 3 and 4 above are innovative concepts in the sense that the end user has a participatory role in the software development. However, when students pay for proprietary software, the relationship is vendor/customer and the end user does not have any say in the features of the current or future software. If the customer requests a change to proprietary software, the customer must wait for the vendor to implement that feature. However; if there is no economical justification for the implementation of the customer request, it will not get implemented. However, in a FOSS environment, the end user has a participatory role. As a participant, he/she can easily implement the feature into the software since the source code is available if they have the knowledge to code; if the participant can not code, the request can be posted to the forum for other programmers to code the new feature into the software.

In summary, in a FOSS environment, everyone – regardless of their role as developer, programmer, distributor, and end-user – benefits immediately as a participant in a growing community.

Expected Outcomes

The expected outcomes of this proposal follow:

1. To improve students' success by providing them with free software to achieve their academic, career and personal goals
2. To incorporate the latest technology in the area of software in classroom and interdisciplinary curriculums
 - a. CIS Department: Integrating FOSS into courses such as CGS1570: Microcomputer Application and some of the programming and networking courses.
 - i. The Openoffice.org which is an office suite will be used in an honor course of CGS1570.
 - b. English Department: Integrating FOSS into most courses offered by the department, and especially those courses offered in the Computers and Composition Project: namely ENC 1101 and ENC 1102 as well as their honors counterparts. Other courses will be identified as one of the outcomes of this proposal and students will benefit from FOSS
 - c. More course offerings as part of Summer Youth College (SYC) and Learning Unlimited.
 - d. Two workshops will be conducted as part of this project in the Development Day in 2007 and 2008.
3. To decrease financial burden on college budget and student spending since the FOSS is free of charge. The savings will allow more efficient use of college resources which can be directed to the area with higher priorities to meet students' financial needs.
4. To bridge international students' communication and technological gaps, since FOSS is available in many other languages such as Spanish, Portuguese, and so on.
5. To present the results of this study on student success in regional and national conferences.

Measuring Outcomes

The outcomes of this proposal can be measured as follows:

1. The number of interdisciplinary courses in CIS and English Departments which can be integrated with FOSS.
2. The number of students will be attending FOSS classes.
3. Grade comparisons between students attending FOSS classes vs. students not attending FOSS classes.
4. Since FOSS is free of charge, the saving can be measured by number of students multiplied by average saving for each student. The savings can exponentially grow as each student distributes the FOSS freely.
5. The number of courses which can be offered as part of Summer Youth College and Learning Unlimited. Again, since FOSS is free of charge there is no financial burden to college to offer these classes which otherwise might not have been possible to offer to the community.
6. The survey of faculty and staff attending the FOSS workshop of Development Day in 2007 and 2008 as a result of this proposal. Additional presentations to regional and national conferences will explain and confirm our commitment to the projects and its benefits.

Benefits to Students and College

The major benefits of this project for students follow:

1. Substantial cost saving on software since FOSS is free of charge.
2. Substantial costs saving on textbook prices since many resources are available free of charge or much lower price textbooks.
3. Improving students' success rate by using a wide range of FOSS application to achieve their academic, career or personal goals.
4. FOSS is available in many languages such as Spanish which will be very helpful for diverse population and disadvantaged students since this feature allows them to use the software and communicate with others. It also provides them an opportunity to pass along FOSS applications to others. The distribution of FOSS allows them to contribute in empowerment of their community which fits very well with the "Community" philosophy of FOSS applications.
5. Providing students with the opportunities to participate in the FOSS projects to gain valuable work experience.

The major benefits of this project for PBCC follow:

1. To provide students with the opportunity to save substantial amount due to the fact that FOSS applications are free of charge. This makes PBCC's offerings more attractive to potential students including current and new students.
2. To improve students' engagement and success by providing those FOSS applications this can help them financially as well as academically.

3. Due to the reduced cost per class, to encourage the college to offer courses which otherwise would not be possible, especially as part of Summer Youth College (SYC) and Learning Unlimited.
4. To address several strategic plan objectives as mentioned in the next part which are all to PBCC's benefit.
5. Recognition for PBCC as an academic institution which promote FOSS to achieve higher academic standards.

Addressing the PBCC Strategic Plan

1. To improve students success by providing them software that they need to achieve their academic, career and personal goals
2. To incorporate the latest technology in the area of software in classroom and curriculum
3. To improve college budget and reduce student spending, consequently releasing college financial resources which can be directed to the areas with higher priorities to meet the college's and students' financial needs.
4. To improve the quality of PBCC's programs and services to increase students' success. Also by providing tools and software to help the students to achieve their academic, career and personal goals.
5. To provide students with Free and Open Source Software (FOSS) in many languages to help students with diverse background to easily bridge the communication and technological gaps in their education.