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The Evaluation of the implementation of WebCT in Principle of Macroeconomics Class

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Abstract

This paper describes the review of implementation of Blended Learning with WebCT in Principle of Macroeconomics class. The course is conducted at the University of Padjadjaran at second semester in 2005. A questioner and a quantitative data are used to support the importance of those kinds of learning method.

1. Introduction

Padjadjaran University (Unpad), since 2003, has started to implement the e-learning system in some courses. This new learning method supports by Utrecht University Nederland through Online Teaching and Learning Project. The main objective of the project-that is funded by Nederland government and Utrecht University- is to guide Unpad to utilize the e-learning method.

The project is started by the introduction of WebCT 4.1 (http://www.webct.com) as the one and only course management system (CMS) that is utilized in e-learning method. WebCT is the most well known CMS by academic institution in the world. Nowadays, it is more and more important for education institution to provide flexible, personalized learning experiences that meet a diverse range of learning needs.

WebCT was designed to empower educational institution with a full range of flexible teaching and learning tools. WebCT support a wide range of pedagogical principles, such as individualized learning, just-in-time remediation, learner-centered education, and active learning.

A lecture or an instructor, by the use of WebCT, has more flexibility to deliver course materials in class with diverse student populations and a high priority on student success,

Today, most of experts believe that blended learning or combination of traditional "face to face" method and e-learning is better than traditional method or online learning alone. The Principle of Economics course that is investigated was based on blended learning method.

This paper describes the author's experience of using WebCT and the students' response of course that deliver by WebCT. The straightforward comparison between conventional method and blended learning with WebCT is presented to support the hypothesis that the outcomes would be better in a WebCT class than in a traditional class.

2. What is WebCT

WebCT is one of several emerging course management system (e.g. A Tutor, Blackboard, ClassWeb, eCollege, First Class, Learnwise, Whiteboard, etc.). WebCT is founded by Murray Goldberg and developed by The University of British Columbia.

According to "Getting Started Guide: WebCT Campus Edition 4.1", with WebCT Campus Edition 4.1 (Now, WebCT CE), course designers may to design a virtual classroom with interactive learning environment where the instructors and students interact. This course management system combines course development and delivery tools with a comprehensive course administration system. With WebCT, one can create entire courses online or complement a classroom-based course (a blended learning method).

Through WebCT instructors may to deliver course materials in form of text, complex equations, images, video, and audio. All of the materials are store and publish in a web-based "virtual class".

WebCT allow instructors to evaluate students' progress with quizzes and assignments. Instructors can customize to all quizzes circumstances. Instructors also can put the grades for offline assignment or quizzes online as well as the online test. Instructors can export the online grade book to an external spreadsheet program and edit all grades.

The students can communicate and discuss with other students in the class or the lecture discussions tools, e-mail, real-time chat tools, and an interactive whiteboard. Instructors may create separate discussion environments for small groups. The Posts can include attachments and links to other internet sources. The entire discussion can be saved or printed for off-line reading.

WebCT also provide a searchable index, glossary, and image database for each course. The instructor may link their content to the glossary and images database to make their course more interactive.

The instructor can encourage student to interact by allowing the creation of student homepages and online presentations.

Instructors may still publish course content on a CD-ROM that can be connected to the WebCT course or viewed offline. Moreover, the content for an entire course can be compiled and downloaded into a format that can be printed or stored locally by the students.

WebCT assists the instructors to share their course material with other designers and institutions.

Concerning to the security issues, administrators of WebCT can protect access to the courses with a username and password. Access can also be restricted based on time and IP address.

One of the most interesting aspect is with WebCT instructors can obtain data that allows them to analyze the effectiveness of the course. WebCT also provide some main statistics calculation for evaluation purposes.

Last but not least, Instructors can track the data of the number of times, time and date on which, and frequency with which each student or all students in a course, as an aggregated group, accessed course content, specific course units and discussion forums. The duration of time each student spent on course content, specific course units and discussion forums can also be seen by instructor. Instructors can also share this tracking result with students.

3. Blended Learning and Course Design

Principle of Macroeconomics Course

Principle of Macroeconomics Course 2005 in Faculty of Economics Unpad consists of 10 parallel classes that presented by 10 different lectures. All of the classes have the same syllabus and objective. One of the classes, which instruct by the author and has 64 students, is the object of this study.

The objective of the course is the students should be able to define and explain about basic concepts in macro economy, for instance; measuring country's income, financial and monetary system, open economy and government policy in macro economy.

This course has 3 credits. While, there is no pre requisite for this course since it compulsory for first year student in faculty of economics.

The course has 14 times two hours-class meeting activity. The class meeting is set up ones a week. At the 8th week the students had to take a mid semester exam and the final exam at the end of the semester.

10 times two hours-tutorial class were provided to improve students understanding on the materials. This tutorial class is managed by the teaching assistant team (TA) that recruited from 7th semester and last year students. This tutorial has 20 percents of total score and compulsory for this course.

Each week, in tutorial class, students have to do some exercise regarding last class meeting material chapter. TA sum up the best 8-instead of 10-of the student exercise result. Students have to get minimum 60 percent to pass this course.

This tutorial class is an important part of this study since the comparison between blended learning class and traditional class is done by comparing average value of "the best 8" among class.

The grading policy that used to assess the students' performances in this course is follows:

1. Tutorial   20%
2. Quizzes, Assignment, WebCT Activity   20%
3. Midterm Exam   30%
4. Final Exam   30%

Blended Learning and Prior Literature

According to Dziuban, Hartman, and Moskal (2004) there are some name for online learning that focused primarily on "on campus" student including hybrid learning, blended learning, and mixed mode instruction.

Dziuban, Hartman, and Moskal (2004) found that in their blended learning courses, student learning outcomes are higher than face-to-face and fully online courses. They also discover that one of benefit of web based course, wether fully online or blended is an increase in student information literacy. Furthermore, students also gained new abilities that advantage their academic and employment career.

In their study Dziuban, Hartman, and Moskal (2004) define that blended learning term refers to courses that combine face-to-face classroom with online learning and reduced classroom contact hours. However, for the purpose of this paper the term "blended learning" is the blended learning without reduce the classroom activity hours.

Some other researches also state that e-learning alone often does not satisfy the set learning objectives for traditional educational institutions, so a changing towards blended (hybrid) learning has been taken.

Individualization benefits of self-paced, online learning for content that requires minimum interaction. Therefore, social benefits of classroom training focused on learning that gains the most from face to-face interaction.

The blended learning approach is not intended to replace either of the individual approaches – online and face-to-face – but rather to build from each to create a new, more effective learning experience for students. The primary goal of the method is to move students from a passive, note-taking role to an active, learning orientation.

The President of Penn State University cites the convergence of classroom and online education as the single greatest unrecognized trend in higher education today (Young, 2002). 80% of U.S. institutions offer blended learning courses (Evolving Campus Support Models for E- Learning Courses, 2003).

Moreover, 94% of lecturers stated that blended learning "is more effective than classroom-based teaching alone"
Furthermore, 85% of lecturers "stated that online learning improves both teaching creativity and student learning" (WebCT Survey, 2004).

How to Blend the Course

There are three different ways that e-learning could be used within a traditional course, i.e.:

1. using the technology to support a traditional course
2. integrating the technology into a traditional course to create a "hybrid" course
3. delivering a course entirely online.

Based on recent finding and trend and also some limitation in education system in Unpad, author believed that the right blend for this course is integrating the new way e-learning methods into the traditional course to create a blended course.

To create a "right blend" for this course; is to determine which parts of the program that has to be taught online.

The first step of this process was to gather all of materials and aspect of this course. According to the author observation and consideration the components of the principle of macroeconomics course are as follows: main text book, lecture notes, attractive PowerPoint presentation, assignment and quizzes, selftest, tutorial, discussion, economics in life, announcement and feedback, class debate, and math and graphics exercise.

As can be seen from the following diagram, the course aspects are divided into 3 groups; class meeting, WebCT, and Tutorial. Class meeting is a two hours face-to-face learning approach whereas basically lecture transfer the knowledge through attractive PowerPoint presentation base on the text book.

Graph 1 Course Components
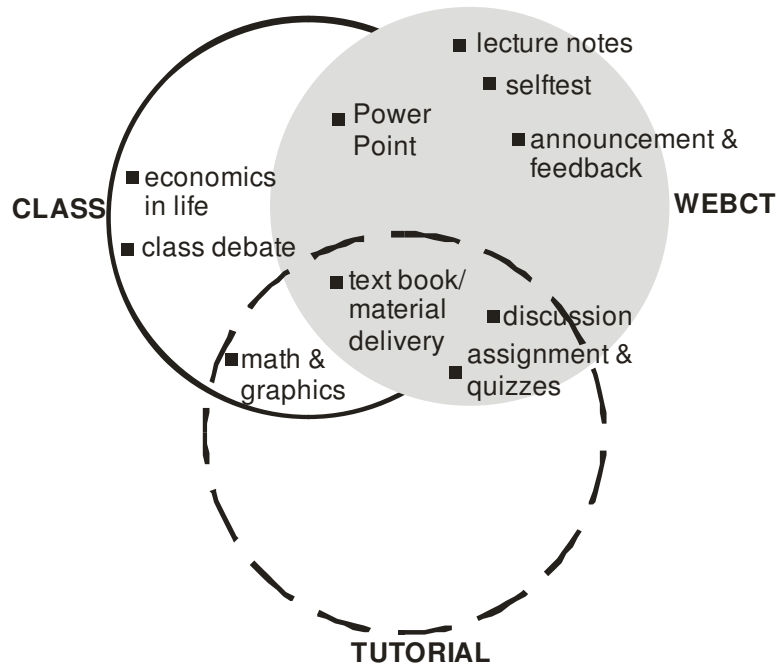
The main text book that recommended in this course is Principle of Macroeconomics 3ʳᵈ Edition by N. Gregory Mankiw. Moreover, to accompany this text book The Thomson South-Western, as the publisher, provides a lot of excellent tools and source. Some tools that adopted within this course are Lecture Notes, Study Guide, WebTutor™ Advantage on WebCT™, Instructor's Manual/Solutions Manual, Instructor's Resource CD-ROM, PowerPoint® Lecture, and a Companion Website.

The other aspects in face-to-face approach are economics is life and class debate. The economics in life is daily lives in our life that has correlation with economics. The lecture delivers this aspect by telling hot news or a history in human race that contain economics value. Some Hollywood movie such as traffic, reality bites, and seabiscuit are also presented in the class to give a broad and deep picture about economics and our life.

Whiteboard as an *eternal* tool in learning process is also utilize, particularly, to explain the graph and mathematical prove. Furthermore, a class debate at the last day of class meeting is presented to practice the students' logical thinking.

Weekly tutorial as a complementary of the class meeting provide exercises in graphics, mathematical prove, discussion, assignment, and quizzes.

WebCT has the most aspects in the course; lecture notes, self test, PowerPoint, text book companion website, discussion, and assignment and quizzes. Despite of the fact that it cannot be conclude that the learning approach in this course is mainly online learning. Online learning through WebCT still work as a complementary tool to increase the students' participation in the course.

There are two reasons of this learning approach strategy. First, this course is a pilot project for the lecture even for Unpad and Faculty of Economics. The new learning method was implemented in an inadequate campus infrastructure for e-learning course. Second, the institution (Unpad) regulation has not has a guideline for the hybrid learning method. It can be identify by the obligation for the lectures to have a full class meeting. The online learning in this course is totally based on author's idea.

WebCT Course[1]

The tools and folder in WebCT that utilized in this course are follow; *Homepage, Harta Karun, Tugas, Kuis and Survey, Discussion, Jendela Dunia Luar, WebCT mail, ActiveGraph, MyGrades, Mankiw's Companion Website.*

Home page is the first page when the students log in to the course. The snap shot of the homepage is presented in graph 2.

Harta Karun's Folder provides all sequence materials for the course. As a default, weekly content of harta karun's folder are PowerPoint presentation file, lecture notes, self-test, and learning objective. The contents were different each week. The students may have information about the next week class.

"Tugas" Folder is a folder that used by lecture to post the assignment to the students. Students also can use the folder for post the assignment in digital form to the lecture.

In this folder "Kuis", lecture can test the students' understanding virtually. The students also can do a self test that provide in computer based.

Through the discussion tool, lecture can conduct a discussion with the students virtually regarding assignments, quizzes, economy issues, and other course issues. Both of lecture and students may post their opinions. They also may post new topics.

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[1] Please visit http://webct4.unpad.ac.id to see the home page. Use *studentfahmi* as the user id and the password.

Graph 2 The WebCT course Homepage

Jendela Dunia Luar is the tool that links to the newest economics source in the internet. This links is adapted from www.eco.utexas.edu/ecosites.

WebCT mail is the electronic mail under WebCT system that replaces the traditional wallboard announcement. This e-mail system is close e-mail environment that protected from students in other class.

One of interactive tool in this WebCT course is *Active Graph*. Students can do some simulation with economic model with only using a mouse. Students are strongly suggested by lecture to using this tool to increase their theory understanding. This amazing tool is taken from The O'Sullivan/Sheffrin Economics CD-ROM.

My Grades is a folder that presents the students' performance. Students can see their quizzes, assignment, and exam grades. With this feature the students can always aware with their progress during the learning process.

Students are strongly suggested to log-in to the WebCT at least ones a week on Monday. Assignment, quiz, and course update are done one day before the class meeting or Monday. The lecture and TAs log-in at least ones a day to answer e-mail, discussion, and to update the course.

4. Method and Data

Questionnaire

A set of questionnaire was used to determine the students' opinion of the advantages of WebCT in the course. The questionnaire is divided into two main parts which are questions about respondents' background and the use of WebCT.

Respondents

The respondents of this study are the students in the author's class in Principle of Macroeconomics. The students who take this course are the first year students in faculty of economics. Most of them have a good understanding in basic math. While, a few of them have been got some basic economics lesson when they were in high school.

The survey

The survey that contain open and close question is performed to capture respondents' opinion regarding this blended learning process.

The survey is divided into three parts which are; first, characteristics of the respondents; second, pedagogical aspects of WebCT in this course; and third, non-pedagogical aspects of WebCT.

The survey is conducted though WebCT tool, 'survey'. The confidentiality of the respondents is well maintaining since WebCT always hide the students identity. In author's opinion this paperless-online survey methods is better than traditional survey when the respondents could be recognized by their hand writing.

The Comparison[2]

A comparison between the students' performance of the author's class and the other nine classes' students is also applied.

The mean of 8-best tutorial grade each class are used as an indicator of students' performance. This numbers are utilized since the problem and the assignment that carried out in each tutorial class is quite similar. Whereas, the students' performance in midterm exam and the final exam-should be a good indicator-was not used. In author's opinion it was occurred since there was a significant different in exam test structure among lectures.

Some *senior* students were taken out to get the *clear* picture of students' performance. The senior students, mostly, has some knowledge regarding problem set in tutorial class. Some students who had less than eight times attendances were also discarded from this study.

5. Result and Analysis

The survey was conducted at the end of the semester through WebCT. There were 58 responses out of 64. The response rate was 89%. The survey questions consist of a range of qualitative and quantitative data.

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[2] This *impudent* comparison is applied without other lectures' permission.

Fifty seven from 64 students in the author's class participated in survey. However, this study also uses 448 student's tutorial class weekly grade.

Moreover, as can be seen from the diagram 3, the number of female students (52.63%) who participated is higher than the male (47.37%). Additionally, table 1 show that the majority of the respondent had not reached their 21(96.49%).

Table 1 Characteristics of the respondents (n=57)

Gender	
Male	27 (47.37%)
Female	30 (52.63%)
Age	
<21	55 (96.49%)
21 - 25	2 (3.51%)
26 – 30	0 (0.00%)
> 30	0 (0.00%)

Furthermore, one of the successful factors of the students participation in this course is 69% or 40 students are regular user of computer. While, only 17.20% or 10 students has some experience in using computer. Graph below presents the complete picture about students' computer literacy.

**Graph 3 Percentage of Students' Computer Literacy**
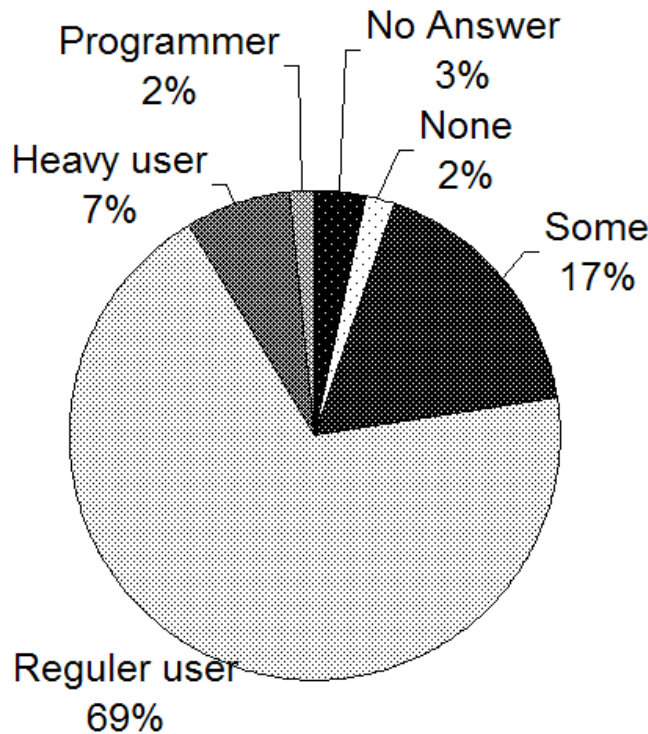
For question: "how many courses that you take this semester using WebCT?" 54 (93.10%) of the respondents answer "1 course", 3 respondents (5.20%) answer "2 courses", and 1 respondent (1.70%) did not answer.

**Graph 4 Percentage of Number of Course with WebCT Taken by Students this Semester**
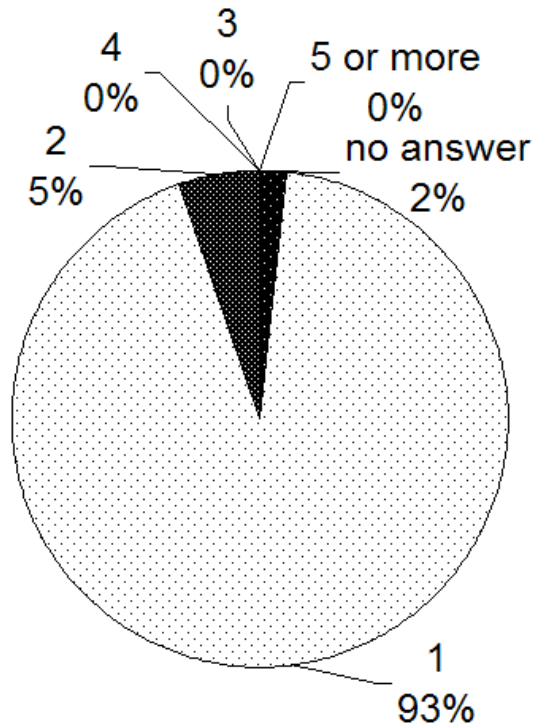
91.40% or 53 respondents answer that he or she has been taking only one course with WebCT. Only one respondent (1.70%) has been taking two WebCT courses. Moreover 5 or more WebCT class has been taking by 2 students (3.40%). Furthermore 2 respondents (3.40%) did not answer.

Graph 5 Percentage of Number of Course with WebCT Has Been Taken by Students

4
0%

5 or more
3%

3
0%

2
2%

no answer
3%

Series 1 Point "1"
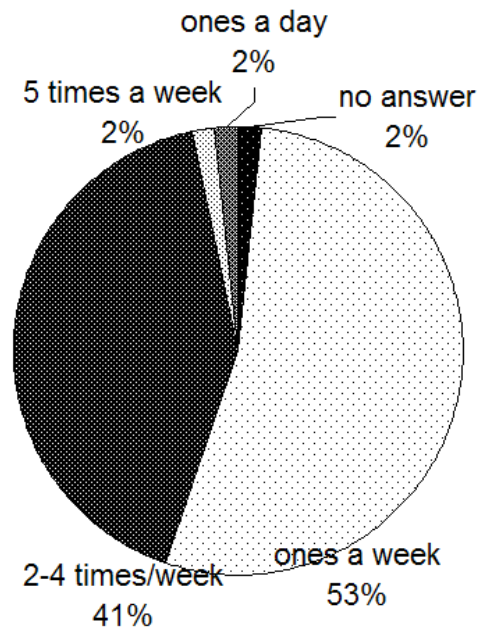Value: 53 (92%)

1
92%
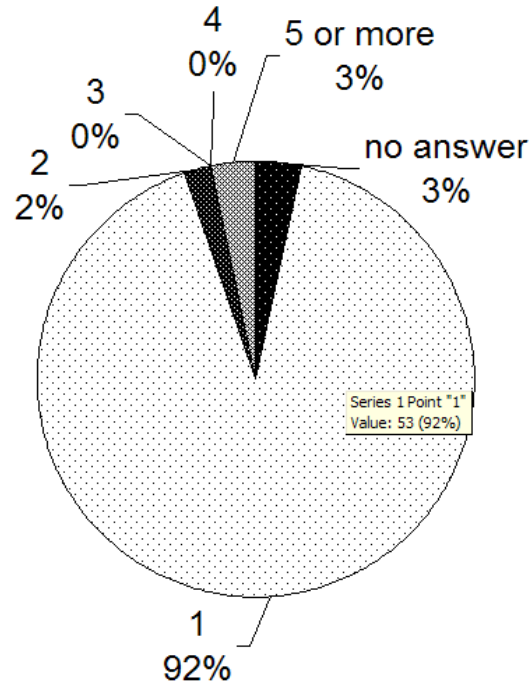
The graph 5 shows that only 24.10% of students accessed WebCT from campus computers. More than half of students, (62.10%) accessed WebCT from internet café (warnet). This result raises two possibilities. First, the level of students' motivation to use WebCT is quite high. Second, Students more enjoy used a no free-*warnet* instead of a free (some place costs very cheap) computers in campus since its availability or connection quality may be poor.
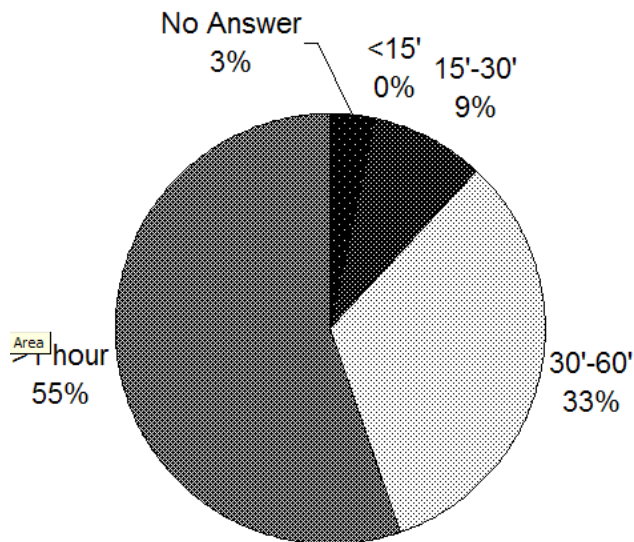
Graph 6 The place of the students where they accessed WebCT

No Answer
2%

Home
12%

Campus'
Computer
24%

Warnet
62%
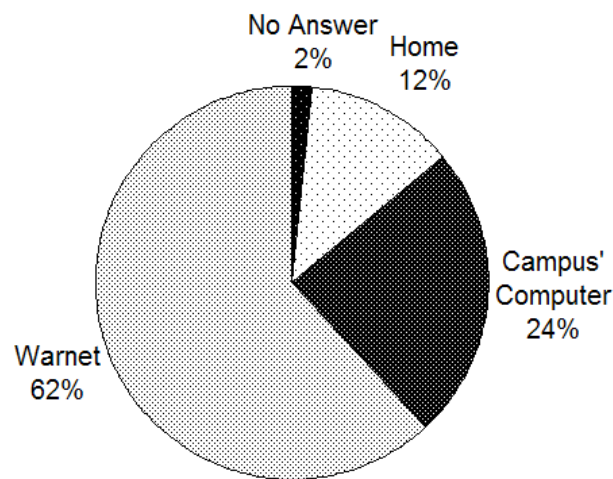
Graph 7 The frequent of the students accessed WebCT

ones a day
2%

5 times a week
2%

no answer
2%

2-4 times/week
41%

ones a week
53%

Graph 8 The Number of Hour per week Students Accessed WebCT

No Answer
3%

<15'
0%

15'-30'
9%

Area ≥1 hour
55%

30'-60'
33%

Despite the fact that most of respondents (53%) accessed WebCT once a week, more than 40% accessed the WebCT 2-4 times per week. Moreover, 33% students accessed WebCT between 30 and 60 minutes per week. Though, 55% of them accessed more than 1 hour per week. From both graph, graph 5 and 6, it can be seen that the habit of most students is not adequate for gaining the all benefit of the web-based learning. Nevertheless, in this early stage of the blended learning development in Unpad this condition is promising.

**Graph 9 The Quality of WebCT Connection**
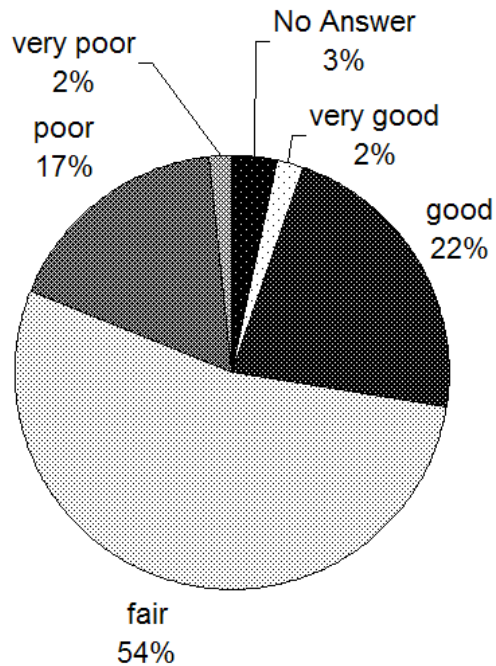
The graph 9 shows that the majority of respondents (54%) state that the WebCT connection speed is fair. Only, 24% agree that the connection speed is good. This fair condition can be happen due to a poor connection in warnet connection or in Unpad networking.

**Graph 10 The Quality of WebCT Design in this Course**
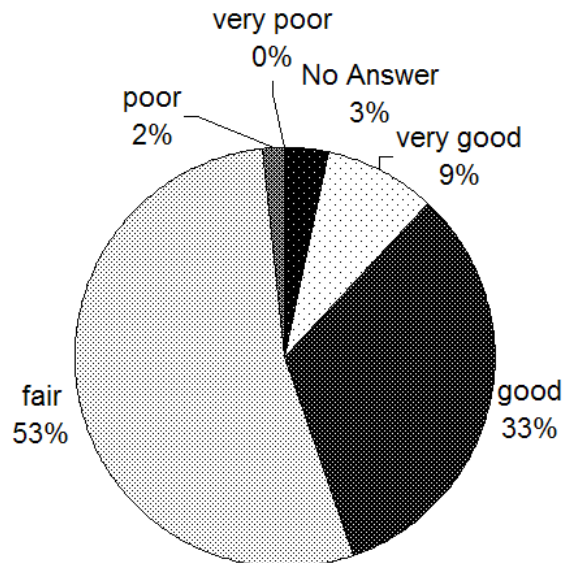
Almost a half respondent or 42% is satisfied with the lecture's WebCT design. Moreover, the other 53% thought that the design is not so bad. Furthermore, only 2% suffer with the design.

**Graph 11 The comprehensiveness of WebCT Tools in this Course**
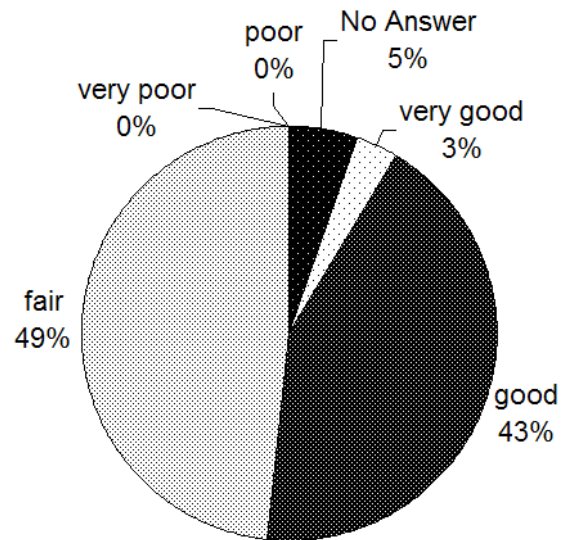
Nearly all respondents (95%) thought that tools within WebCT course are comprehensive. Despite of there was a 5% *no answer* respondents, no one consider that this WebCT course is lacking.

Graph 12 The Quality of Lecture's Instruction in WebCT Course
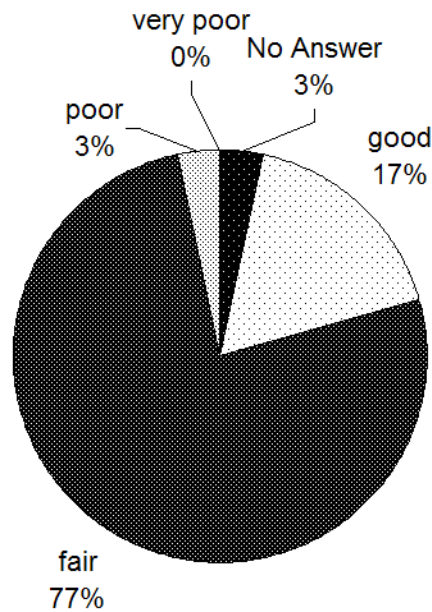

This part could be one of the weaknesses of this WebCT course when 77% respondents believed that the quality of lecture's instruction is fair while 3% respondents consider it was poor.

**Graph 13 WebCT helps you in this course?**
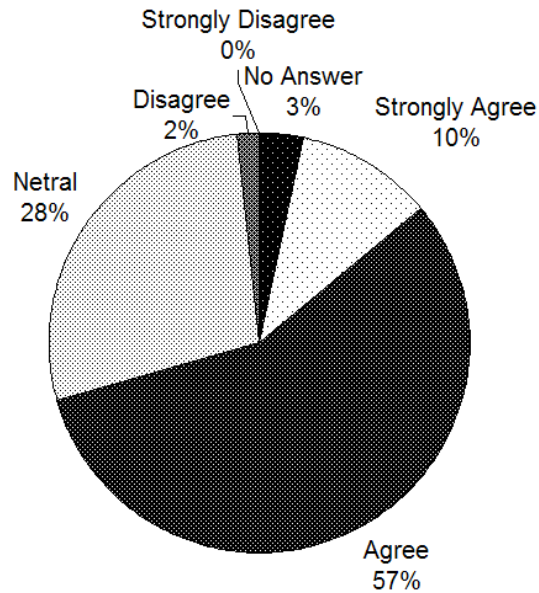
Most of respondents are agree (57% agree and 10% strongly agree) that WebCT helps them in this course. On the other hand, only 2% thought that WebCT did not help them to understand the essence this course. Furthermore there are 28% respondents who took a neutral position.

Graph 14 What kind of experience that you got with WebCT in this course
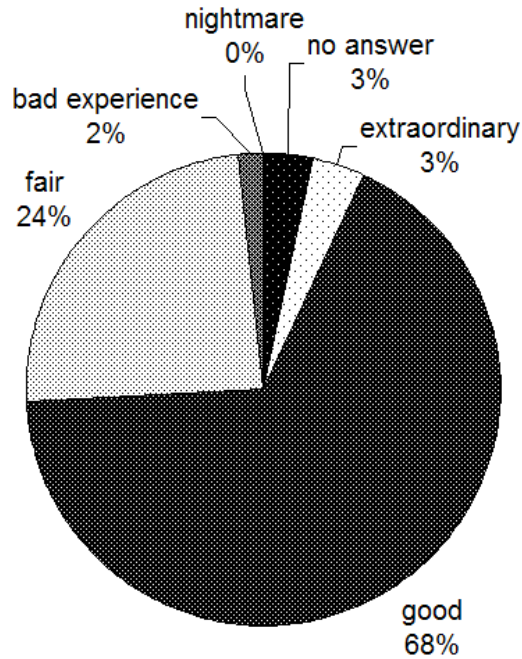
Although there are 24% respondents faces a fair experience, the most of respondents had a good (68%) and extraordinary experience toward the using of WebCT in this course.

Graph 15 Compare this course to other courses
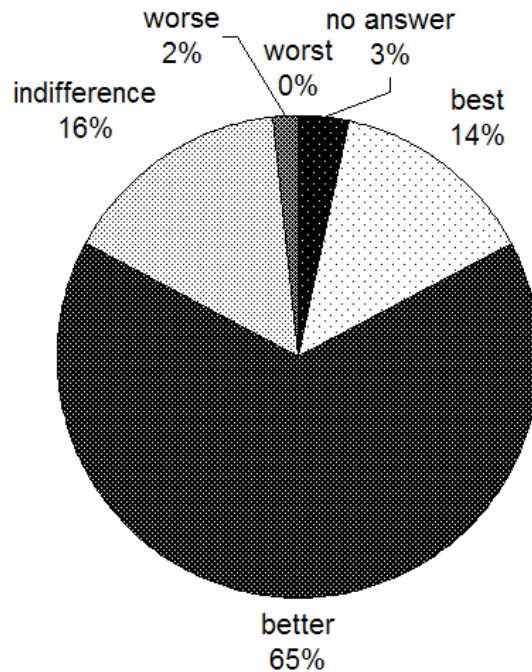
The graph 15 shows that most of students (65%) in this class believe that their class is better than other classes that had been taken. Moreover, 14% state that this course is the

best. Only 2% thought that this class is worse than other classes while 16% was indifference.

The class debate in the end of the semester is a most favorite aspect, excluding WebCT, in this course. In the class debate author divided the class into 3 groups. 1st group is a pro's team and 2nd is cons' team. The 3rd group is chosen as an organizer for the event. They all were seemed enjoy the debate.

Graph 16 The Good Aspect in this Course, excluding WebCT
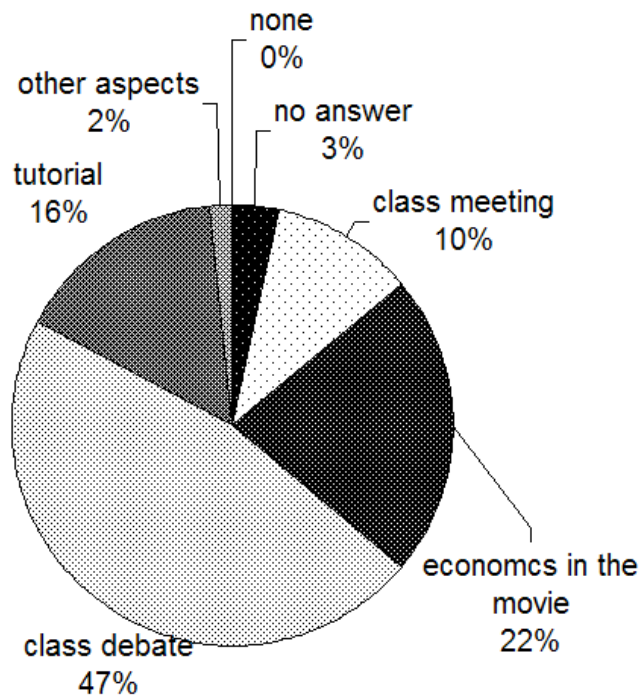
Table 2a Descriptive Statistics of Students Performance in Tutorial

Class	N	Mean	Std. Deviation
Author's Class	58	85.02	5.68
4	57	85.53	4.56
7	57	84.56	6.17
10	53	84.29	5.26
2	42	84.28	5.43
5	34	84.25	5.63
3	26	84.04	6.10
6	48	81.44	4.75
8	40	81.11	4.99
9	33	80.21	4.31

Class	N	Mean	Std. Deviation
ALL	448	83.67	5.53

From table 2a, it can be seen that the students' performance that was measured by 8-best tutorial score is almost perfect. The author's class mean score, 85.02, is only beaten by the 4th class, 85.53. Moreover, the mean score of author's class is bigger than the mean of all students, 83.67. It suppose that the performance of students. However, the big gap among students score in the author's class that presented by standard deviation is has to be consider.

Table 2b Descriptive Statistics of Students Performance in Tutorial

Class	N	Minimum	Maximum
Author's Class	58	73.25	93.88
8	40	70.13	94.56
7	57	58.98	94.25
2	42	75.19	94.06
3	26	70.06	93.75
4	57	71.25	93.00
5	34	65.41	93.00
10	53	68.34	92.84
9	33	68.94	90.63
6	48	69.76	89.44
ALL	448	58.98	94.56

The positive result of this study is congruence with the author's experiences. For the author, this blended learning class is the best class ever. There are some factors that make the WebCT class pleasurable for the author. First, the interaction between students and the lecture is considerably better than in a traditional class. One of the indicators that show this achievement is the large number (see table 3) of discussion that posted in WebCT by students.

Table 3 Descriptive Statistics of Students Performance in Tutorial

No.	Topic	Total
1	Main	92
2	Notes	0
3	WebCT	19
4	Praktikum	6
5	Economics in our live	99
6.	**All**	**21**

The number of incoming e-mail, which is 115, is another proves that the students' involvement in this class is extraordinary.

The data from table 3 below that collected from *the WebCT track pages tool* shows that the attractiveness of the students to accessed the online materials in WebCT.

Table 4 Track Page Students Visit

Pages	Hits	Time	Time/ Hit	Posts
45	1553	476:43 :29	18:25	0

6. Conclusion

The results of this study are not designed to develop a general conclusion regarding the use of WebCT to the students. These result has only suggest the experience of author and his students toward their initial involvement with WebCT.

The general conclusion regarding the use of WebCT by students in the author's class seems encouraging. However, the implication of using WebCT as complementary in face-to-face over one semester in this study does not ensure that the use of the WebCT by other lectures and other subjects will gain same outcome.

Finally, despite of the limitation of this study, the implementation of combining WebCT with the face-to-face method in Principle of Macroeconomics class is a precious and constructive experience for the author's learning process development.

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