PROCEEDINGS

The 8th International Conference of Developing
Educational Professionals in South East Asia

Collaborative
Research-Based
Learning and Teaching
to Foster Teacher Professional
Development

9 - 10 December 2014
Universitas Negeri Jakarta
Jakarta, Indonesia

English Department
Faculty of Languages and Arts
Universitas Negeri Jakarta

and

Developing Educational Professionals in
South East Asia (DEPISA)

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Editor:

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The 8th DEPISA Conference 2014   Universitas Negeri Jakarta, Indonesia

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THE 8th INTERNATIONAL CONFERENCE OF DEVELOPING EDUCATIONAL PROFESSIONALS IN SOUTH EAST ASIA

Aims and Scopes

The 8th DEPISA is an international meeting point for professionals and practitioners in education to share, reflect, and exchange ideas as well as experiences in researching and supporting Teacher Professional Development across educational levels. The conference also aims at further expanding its network to include other educational institutions across the world.

The theme of the 8th DEPISA is "Collaborative Research-based Learning and Teaching to Foster Teacher Professional Development". Papers in this proceedings cover action research for learning innovation, pedagogy and learning innovation, ICT and learning innovation, learning of content subjects, cultural aspects in education and learning, quality assurance in teaching and learning, mentoring teachers as learners, and teacher education for 21st century.

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Editor's note

The 8th International Conference of Developing Educational Professionals in South East Asia is an international meeting point to share, reflect, and exchange ideas as well as experiences in researching and supporting educational professionals in collaborative research-based learning and teaching to foster teacher professional development.The conference aims at further expanding its network to include other educational institutions.

The theme of the 8th International Conference of Developing Educational Professionals in South East Asia is "Collaborative Research-Based Learning and Teaching to Foster teacher Professional Development". Papers in this proceedings cover pedagogical aspects of teaching and learning approches and methodologies, psychological-related goals of education, IT-preschool age to adults, teachers, and parents, the language teaching-learning-assessing triangle, attitude and capacity building in nursing courses, mathematics, and science teaching, educational policy, material development, motivation and management styles at university.

Appreciation should go to our home institution, *Universitas Negeri Jakarta*, for providing support of the process. Credits also go all the organizing committeefor the commitment to do their best to make this big project possible.

December, 2014

Foreword (Vice Rector 4 UNJ)

Distinguished speakers, honorable guests and all participants of the 8th International Conference of developing Educational Professionals in South East Asia. I would like to extend the warmest welcome to all of you attending this International conference at Universitas Negeri Jakarta. It is my pleasure to meet you all in this very important conference in which I believe many papers and sharing of best practices of teacher development will be discussed.

The vision of Universitas Negeri Jakarta is to build future leaders. To implement such a vision, Universitas Negeri Jakarta is committed to continuously contribute its role so that leaders in education sector might be made and/or when possible might be born. This is applicable in both teaching and non-teaching professions. To achieve it, I am convinced that collaboration with many educational institutions is imperative. Therefore, in this regards, I must support this very important event.

Ladies and Gentlemen,

I must acknowledge and express sincere gratitude to University of Sydney, Australia who initiated a project in 2015 entitled "Collaborative Research-Based Learning and Teaching to Foster Teacher Professional Development". I believe without such a program DEPISA conference might not be possible. In particular, allow me to mention Dr. Kevin Laws and Dr. Lesley Harbon of the University of Sydney Australia for their initiatives to accommodate Teacher Professional Development through DEPISA. My credit also goes to Prof. Dr. Ilza Mayuni, MA for all of her efforts to make this 8[th]International Conference DEPISA possible. Acknowledgement must also be given to speakers and presenters of plenary sessions who have serious concern to share their expertise and professional experiences as far as teacher development is concerned.

I must also share my gratitude to universities collaborated under DEPISA who have been working hard to make this conference possible. I hope in the future more universities from more countries might be invited so that DEPISA could play its role to cover wider areas in the globe.

I must appreciate Steering and Organizing Committee, the English Department and the Faculty of Languages and Art of Universitas Negeri Jakarta. Your contribution is very significant to make this event possible.

Last but not least, I must also mention and address my sincere gratitude to all speakers and paper presenters as well as all participants of this conference. Without your active participation this event is not possible.

Thank you very much.
December, 2014

Vice Rector 4 UNJ
Foreword

This Depisa International Conference Proceedings , marking the 8th of the Depisa conference, is devoted to the developing educational professionals in Southeast Asia convened by the State University of Jakarta in cooperation with Depisa on 9-10 December 2014. The theme of the conference was *Collaborative Research-Based Learning and Teaching to Foster Teacher Professional Development*. This issue addressesthe compiled keynote speeches from the plenary sessions of the conference and the selected papers presentedin the parallel sessions.

The two keynote speakers whose addresses are included here are Lesley Harbon, University of Sydney, and Arief Rachman, State University of Jakarta. They take bird's eye view of the current situation in which Harbon focusses on the increasing educational practices in Southeast Asia with the theme *A Developing Community of Practice: What can We Claim so far?* Rachman, a nationally-recognized figure of education in Indonesiahighlightsthe endless endeavour to developteacher's professionalism and the altercation of the recently established curriculum 2013. They commenced the conference exploring various issues on educational praxis in different fields in Southeast Asia.

The other contributors of this issue are teachers and faculty members of all education levels from kindergarten to university mostly from Indonesia and other countries of Thailand, Vietnam, Laos, Korea, and Philippines. They examine pedagogical aspects of teaching and learning approaches and methodologies, psychological-related goals of education like leadership and volunteerism, and IT-pertinent teaching practices. The subjects studied are a wide-ranging learners from preschool age to adults, teachers, and parents and the focusses are the language teaching-learning-assessing triangle, attitude and capacity building in nursing courses, mathematics and science teaching, educational policy, material development, motivation, and management styles at university.

I believe that you will find this issue of proceedings compiling papers and research reports useful to widen your horizon on educational development, especially in Southeast Asia. Besides, it could help enhance your educational professionalism through the lessons learned from the contributors' experiences and ideas. This proceedings could be found at English Department of State University of Jakarta and is published alongside the Depisa Monograph scheduled to be issued in every Depisa conference biannually.

Ifan Iskandar

Chair of Steering Committee of the 8th DEPISA Conference
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USING ICT TO TEACH MATHEMATICS IN ENGLISH

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Abstract

This research was based on the current issues of mathematics classes in Indonesia, i.e. the utilization of Information and Communication Technology (ICT) in the learning processes, and the difficulties faced by Indonesian students in understanding basic concepts of mathematics, namely when it was taught in English. Regarding to the previous condition, this research was aimed at overcoming the students' difficulties in studying mathematics through ICT-based instruction–web-based applications. This research was a classroom-based action research toward 8th grade students of a private junior high school in West Jakarta, Indonesia. It was conducted in two cycles. Each cycle consisted of four steps, namely planning, action, observation, and reflection. Findings of the study showed that the utilization of ICT-based instruction, in this case, web-based applications and resources could improve the mathematics achievement of the students. Furthermore, the result of the research done also indicated that the use of ICT in teaching mathematics could make the teaching process more effective as well as enhance the students' capabilities in understanding basic concepts of mathematics in English.

Keywords: ICT based instruction, Mathematics in English

Introduction

Mathematics as an essential foundation for other sciences needs to get special attention indeed. Based on the results of the TIMSS (Trends in International Mathematics and Science Study) on mathematics and science achievement of students in 2011, Indonesia was ranked 38th out of 42 participating countries with an average score of 386, while the international average score of 500 (Mullis et al., 2011). This international mathematics achievement of Indonesia becomes a general overview of mathematics learning conditions in Indonesia-it is out of the expectation. This fact indicates that the mathematics learning condition needs to be improved, and ways to overcome the condition need to be discovered soon.

Furthermore, Mathematics is about relationships: relationships between numbers, categories, geometric forms, variables and so on. In general, these relationships are abstract in nature and can only be brought into being through language. Even mathematical symbols must be interpreted linguistically. Thus, while mathematics is often seen as language free, in many ways learning mathematics fundamentally depends on language. Dale and Cuevas (as cited in Jarrett, 1999) identify that mathematics has been thought of as an area with minimal language demands. In fact, mathematics and language are connected—language facilitates mathematical thinking. For students who still developing their proficiency in the language namely English as a foreign language, it becomes a considerable challenge for them to study mathematics in English. Barwell (2008) states many ESL/EFL students are quickly able to develop a basic level of "conversational" English. However, it takes several years to develop more specialized

"academic" English to the same level as a native speaker. It indicates that ways to accelerate the students' capability in understanding Mathematics (academically) instructed in English should be enhanced.

In the context of Indonesian-mathematics classes, it appeared that students who were engaged in Mathematics using English as a means of instruction, had difficulties in understanding the subject. The similar condition also occurred in many schools in Indonesia. This condition is consistent with the result of study conducted by Ariyania, Sumintonoa, and Azkiyahc (2013) in Riau, Indonesia. It was found that the students experienced having difficulties to learn and understand the concept of mathematics in English because the lacking skill in English. It was acceptable since English is a foreign language in Indonesia. Studying Mathematics with Indonesian as the language of instruction is quite difficult. And when the subject should be studied in English, it becomes more difficult and requires the students to study hard to understand both the subject contents and the language.

In addition to the recent situation of mathematics classes, it is expected that ICT is also brought into the learning processes. Ittigson and Zewe (2003) cited that technology is essential in teaching and learning mathematics. ICT improves the way mathematics should be taught and enhances student understanding of basic concepts. ICT also promotes greater collaboration among students and encourages communication and the sharing of knowledge. Furthermore, particular ICT-based tools gives feedbacks to students which contributes towards their positive motivation. It also allows them to focus on strategies and interpretations of answers rather than spend time on tedious computational calculations. ICT also supports constructivist pedagogy, wherein students use technology to explore and reach an understanding of mathematical concepts (Becta, 2003). Additionally, Hudson (2010) also states that students are expected to learn about and use information and communication technology (ICT) in mathematics to prepare them for their future, the work force and the challenges of everyday life.

There are some relevant researches have been conducted in the field of teaching Mathematics in English and ICT. Cherkas and Welder (2012) within their research reviewed and investigated web-based tools in terms of their interactivity, dynamic capabilities, pedagogical strengths and weaknesses, the practices they employ, and their potential to enhance mathematical learning both inside and outside of the collegiate classroom. Culled from these reviews is a working definition of "best practices". It refers to condensing difficult mathematical concepts into representations and models that clarify ideas with minimal words, thereby enabling a typical student to grasp, quickly and easily, the underlying mathematics concepts.

The use of web-based also investigated by Melis et al. (2001). The research investigated the use of ActiveMath for Mathematics classes. ActiveMath uses a generic web-based learning system that dynamically generates interactive (mathematical) courses adapted to the student's goals, preferences, capabilities, and knowledge. The course is presented in the form of standard web-browser to its users. This research has shown that ICT based instruction, namely web-based instruction may provide effective and various activities for students for having better knowledge and understanding on mathematics.

With regard to the current condition and expectation toward the mathematics classes in Indonesia, a preliminary observation and interview has been done toward eight grade students of a private junior high school in West Jakarta, Indonesia, which Mathematics classes utilizing English as means of instruction. It is found that students' achievements in English-Mathematics were low. Students assumed mathematics was difficult subject to learn, and they found it was difficult to understand the concepts since they were rarely exposed to mathematical activities which use English as the medium of

instructions. Furthermore, they thought that it would be more challenging and interesting to study if the learning processes were more flexible and adaptable to their preferences, as well as enjoyable.

Based on the recent condition of English-Mathematics classroom, it is recognized that it is necessary to do an action research in this field namely about the utilization of ICT to teach mathematics in English, mainly to cope with the problem faced by both mathematics teacher and students. In this study, the writers designed a web-based learning and try to take advantages of some web-based applications and resources, like LearnBoost, quizfaber, google drive, what2learn, etc, in order to examine whether the utilization of ICT to teach Mathematics in English is able to improve the students' achievement or not.

ICT based instructions

ICTs stand for information and communication technologies and are defined as diverse set of technological applications and resources used to communicate, and to create, disseminate, store, and manage information. These technologies include computers, the Internet, broadcasting technologies (radio and television), and telephony (ICT in Education/ Definition of Terms, n.d.). In this study, ICT is the term used to refer to the web-based technological applications and resources used to teach as well as to learn Mathematics in English. In other words, the tools are used by both the teacher and students.

Becta (2003) identifies some key benefits of using ICT to teach Mathematics in English based on the research evidence, as following: greater collaboration between students (ICT provides a focal point which encourages interaction among students, as well as between students and the technology itself; an increased focus on strategies and interpretation; fast and accurate feedback to students using ICT; and increased motivation amongst students. In teachers' point of view, Jarrett (1998) states that the implementation of technology in Mathematics classrooms can trigger three changes among teachers, the increasing of students' expectations, the more student-centered approach to teaching, and a greater willingness to experiment. This indicates that ICT supports a constructivist pedagogy, where students use technology to explore and reach an understanding of mathematical concepts.

Ruthven and Hennessy (2003) identify some benefits of using ICT in teaching and learning Mathematics, i.e. effective working processes and improving production, supporting processes of checking, trialing and refinement, enhancing the variety and appeal of classroom activity, fostering students' independence and peer support, overcoming students' difficulties and building assurance, and focusing on overarching issues and accentuating important features. Seen from the previous benefits of using ICT in teaching Mathematics above, it implies that it is important to maximize the impacts of ICT in math teaching.

According to Becta (2003), teachers can maximize the impact of ICT in math teaching by using ICT as a tool in working towards learning objectives, developing a knowledge of the multimedia software available, considering how to provide access to ICT resources for all, and incorporating the use of portable ICT equipment in teaching. Moreover, in order to gain the effectiveness of the utilization of ICT in teaching Math in English, there are several factors which should be taken into account, such as: 1). the most appropriate hardware, software, and support is available to teacher and students; 2). students are equipped with ICT skills which are adequate to achieve the objectives set for them; 3). there is appropriate mediation by the teacher between students and computers, so that where students are expected to become active learners, the teacher provides

support rather than direction; 4). students are encouraged to take advantage of the automation of tasks and instant feedback by ICT, making use of conjecture and applying trial and error methods in their work; 5). teachers are aware of the range of software available, and select programs to support particular learning skills; 6). on and off-computer time is balanced in accordance with learning needs; and 7). Students with special needs have equal access to ICT through access devices.

Web-based applications for teaching and learning Mathematics in English

In software engineering, a web application (webapp) is an application that is accessed using a web browser via a network such as internet or intranet. It also is a computer software application that is coded in a browser-supported language (such as HTML, JavaScript, AJAX, Java, etc.) and depends on the explorer to display the application (Web Application, n.d.).

There are many web-applications applicable for teaching Mathematics in English. They are divided into two, seen from its functions: the lesson planner and the complementary applications. The lesson planner, called LearnBoost, is a user friendly application that can integrate some resources generated from the complementary applications for lesson planning. The complementary ones are mathematical applications and other resources in digital forms that can be used for teaching and learning mathematics, e.g. quizfeber, what2learn, google drive, etc.

a. LearnBoost

LearnBoost is a free all-in-one solution allows teachers to manage their classroom by offering an amazing gradebook, software for managing and creating lesson plans, tracking attendance, maintaining schedules, integrating Google Apps including calendars, tagging of Common Core Standards, and so much more.

As a learning tool, LearnBoost helps organizing all documents properly. With the ease of access, teachers, students, and parents can access this tool through computers, gadgets and other similar communication devices. It makes easier for the teachers to collect information and measure the development and progress of their students and to find out who need the help of a teacher.

There are various features of the LearnBoost, as following:
1. Gradebook, containing scores of tasks, and the average value of the class
2. Lesson Plan, can be used to create multimedia learning designs
3. Calendar, automatically synchronized with google calendar, about the schedule of activities and tasks to be distributed to parents and students
4. Attendance, a feature that serves as students' presence. With this feature, parents can determine the presence of students every day.
5. Reports and Analytics: visualizing student performance in real-time, and including anecdotal comments on report cards
6. Sharing: share class calendars, attendance records, comments, and grades online with parents and students
7. Data: easily export data to integrate with your existing school system
8. Mobile: use Learn Boost on the iPad. Just fire up your iPad's browser.

There are many advantages which can be obtained by using LearnBoost, as follows:
1. Free and easy for teachers to use - no training required.
2. Integrates with your Google account to make using LearnBoost grading and lesson plan software even simpler
3. Stunning, easy-to-interpret charts and reports generated automatically
4. All-in-one gradebook, lesson planning software, attendance, calendars, and reporting.

5. With Classroom reporting, any educator can get a feel and detailed views of class progress and attendance in the classroom reporting center. Also with student reporting, user can easily analyze the strengths and weaknesses of their students for better learning.
6. Promotes home and school connections with integrated parent and student platform. With sharing capabilities of the platform, teachers can email and share grades, assignments, attendance, course calendars with parents and students for instant notification and engagement.
7. With grades, Teachers can teachers can enter grades and students can watch their scores update instantly and also customize their grading scale as per the assignment or test.
8. Built-in safety and security that you deserve
9. Use LearnBoost as an individual teacher or roll it out school wide with an administrator account in minutes
10. Feedback tab connects you to our friendly and helpful team
   (LearnBoost, n.d.)

b. Quizfaber

QuizFaber is a freeware software for Windows that enables students to create multimedia quizzes as HTML documents. This program simplifies quiz-making in HTML without any prior knowledge of HTML or JavaScript. The quiz is ready to be published on Internet, in a local network (with Intranet protocol) or on a local PC. It can be fully customize for the choice of background images, colours, sounds and font types. QuizFaber create and manage many different types of questions: questions with multiple choice, questions with multiple answers, jigsaw question type, true or false questions, numerical answer question, question with an open answer, hotspot question, gap filling exercises, and matching words (Galli, 2014).

c. What2learn

What2Learn is a game based interactive learning system. Teachers and students can sign up for free. Once students or teachers login they have the capability to create games or choose from the 1000's of free games available. The teacher can print worksheets for use in studying or preparing for upcoming tests. This site makes learning fun and encourages students to enhance their academic progress. The exams and drills provide instant feedback. Moreover, the site gives students autonomy in choosing what to play and when, as well as utilizes popular concepts for students (What is What2Learn, n.d.).

d. Google Drive

Google drive is a file storage and synchronization service provided by Google, which enables user-cloud storage, file sharing and collaborative editing (Google Drive, n.d.). In this research, google drive serves as the storage of learning materials, in the form of documents, videos, as well as quizzes created using quizfeeber. It can also be used by teachers to store all tasks/assignments uploaded by students.

Mathematics in English

The traditional belief about teaching mathematics was that it represents transmission of rules and definitions and the language use is less important. However, the contemporary perception of teaching mathematics is much broader, it covers not only

pure mathematical issues, but it also instigates such mental and cognitive processes as problem solving, development of strategic thinking and information processing (Novotná, Hofmannová and Petrová, 2008). Such range of tasks calls for adequate communicative tools. In this context we may recall Pirie (as cited in Novotná, Hofmannová and Petrová, 2008) who states six means of mathematical communication and classifies them as follows:

a. *"Ordinary" language*. Here the term *ordinary* denotes the language current in the everyday vocabulary of any particular child, which will, of course, vary for students of different ages and stages of understanding.

b. *Mathematical verbal language*. *Verbal* here means "using words", either spoken or written.

c. *Symbolic language*. This type of communication is made in written, mathematical symbols.

d. *Visual representation*. Although not strictly a "language", this is certainly a powerful means of mathematical communication.

e. *Unspoken but shared assumptions*. Again, these do not really fall within the definition of "language", but they are a means by which mathematical understanding is communicated and on which new understanding is created.

f. *Quasi-mathematical language*. This language – usually, but not exclusively, that of the students – has, for them, a mathematical significance not always evident to an outsider (even the teacher).

What is mentioned previously shows the variety of means of communication hold for the understanding of mathematical concepts that students build. It implies that mathematics has a unique communication problem that arises because the language used in the mathematics teaching and learning, namely while talking about mathematics and writing or answering mathematics test using particular language—ex. English. It means that within the process of teaching and learning of Mathematics, it is important to implement techniques which can supports the students' understanding toward mathematics concepts and the language used as well. Seen from the advantages of web-based instructions to develop and fulfil the previous expectation. In this study, it is assumed that the utilization of web-based instructions was able to improve the students' mathematics achievement, though it was taught in English.

Research Method

The subjects of this study were eighth grade students of a private junior high school in West Jakarta, Indonesia, which implements English Immersion. The writer chose those students due to the result of interview toward the teacher and the students which shows that the students had several problems in Mathematics, especially when it was taught in English. Moreover, the subjects were chosen based on the consideration that as they have already got Mathematics for about one and a half years, two semesters in class VII and one semester in class VIII, Therefore their Mathematical skill before they were given any treatment can be identified and finally, the result could be compared when they already had the treatments.

This research was designed as a classroom – based action research. It was carried out two cycles, in which each consisted of four steps: (1) Planning, (2) Action, (3) Observation and (4) Reflection, each cycle is planned consisting of three meetings; therefore within two cycles there were six meetings.

In order to collect the intended data, the present study made use of the lesson plan including the teaching scenario and learning materials which were uploaded to internet and shared to students through LearnBoost. It was used as guidance for the teacher in

conducting his/her teaching. It is prepared to give the teacher a clear description of how he /she were going to teach. Furthermore, the materials uploaded were studied by the students. The other instruments used were mathematics tests (pre-test and post-test)— which results were used to determine the improvement of student's mathematical skill, and research's diary—used for gathering data of students' activities during the teaching learning process and some problem faced by the students during the teaching learning process of each cycle. The obtained data could give some positive feedbacks in planning the following action.

The obtained data were analyzed descriptively and quantitatively. The obtained data were analyzed by calculating mean score, afterward, the result was interpreted both qualitatively and quantitatively to determine the criteria of the achievement.

Findings and discussion

The main purpose of this study was to improve the students' mathematics achievement and more specifically to improve the students' mathematics achievement which is instructed using English. After conducting all treatments in two cycles, what were expected by the researcher could be accomplished.

The result of the pre-test showed that the students still had problems in term of mathematics terminologies. The mean score of the students' achievement was 62.4 (62.4 % of the maximum score) and still under the minimum standard score. Based on the observation and interview, it was found that they had problems in understanding both the language and the basic concepts. The students' score were gained from the analysis toward the students' answers toward the pre-test. Based on the result of pre-test and observation, the next activities were the treatments toward the students. The students were asked to do activities online. And while doing the activities the students were assisted by the teacher.

The treatments given to students were divided into two cycles as following:

Cycle I, the topic of discussion in the class was "circle definition and its parts". Firstly, the students were introduced to LearnBoost—a web-based application, which should be accessed online, as well as trained to use it. In the 1st phase, the students were given some reading materials in the form of a pdf or a PowerPoint that students could use to help understanding the concept of a circle and its parts. However, based on the observation and reflection done toward the whole activities in this phase, it was found that there were some barriers, as following:

- Most students found difficulties in using these learning applications. It was understandable because they were rarely exposed to this kind of activity. They needed time to get into the habit of making use of LearnBoost.
- The students also could not understand well about the topic being discussed, they thought that the materials offered were difficult to understand, and they were not familiar yet with the terminologies used.
- Source readings uploaded could not help students build their understanding of the material being studied.

With regard to the obstacles faced in the 1st phase, some modifications in the lesson plan for 2nd phase were made, i.e. adding some links of learning media (URLs) such as video tutorials, and several links to websites containing topics about circle and its parts, and adding a link of math dictionary to facilitate student understanding about mathematical terminology in English. After treated twice in cycle 1, the students' mathematics achievement was increased from 62.4 to 70.4 (Post-test I).

Cycle II, the topic of discussion was still circle, but the focus was on "circumference and area". For the 1st phase of cycle II, the students' activities in the classroom were modified in certain ways. The students appeared in need of ice-breaking activities which were fun, challenging, and relaxing. In this phase, the students were given puzzles to be solved, in the form of crossword. Afterwards, in the 2nd phase, since the students' understanding about mathematics questions was improved and they were getting into the habit of using web-based applications and resources, the same activities were carried out in the classroom, in which the game offered to the students was word scramble. Based on the observation and reflection toward the students' activities, it was found that the mathematics puzzle and game (word scramble) could make students feel challenged to understand and find out, as well as memorize the basic terminologies of mathematics—namely circle. On the top of this, the mean score of students' mathematics achievement was increased from 70.4 (Post-test I) to 79.6 (Post-test II). Herewith, the results of students' pre-test and post-tests (I and II) are presented, as follows:

Table 1. Improvement of the students' mathematics achievement

Type of Test	Mean score	Percentage	Category
Pretest	62.4	62.4%	Insufficient
Posttest I	70.4	70.4%	Sufficient
Posttest II	79.6	79.6%	Good

The table above showed that in the beginning the students' mathematics achievement was low. The mean score was 62.4 (62.4% of the maximum score). The score was lower than the minimum standard score of the school. In the post-test I the students' mean score improved 12.82 % from the pre-test became 70.4 (70.4% of the maximum score). Afterward, the students' achievement improved again from 70.4 to 79.6 (79.6% of the maximum score). It was seen from the mean score of post-test II. The improvement was 13.07% from post-test I. The students' mathematics achievement turned to be better as the cycle were continued.

Conclusion

Based on the result of data analysis and the observation done, it was found that the mathematics achievement of the students can be improved by using web-based instruction. It can be seen from the improvement of the students' mean score from 62.4 (62.4% of the maximum score) the pre-test to 70.4 (70.4 % of the maximum score) at post-test I, and at last it became 79.6 (79.6% of the maximum score) at post-test II. The students' final means score 79.6 (79.6% of the maximum score) also indicated that the students already pass the minimum standard score, since it is more than 65% (79.6% > 65%). Additionally, from the observation done in the classroom it was realized that the utilization of web-based instruction appeared to be a good strategy to be implemented in the classroom. It was considerable since through web-based activities the students could be accustomed to work with technologies, internet-based activities, as well as the concept of mathematics. Furthermore, the students have better knowledge and understanding in mathematics terminologies that made them learn the language. Moreover, the strategy also gave the students opportunities to become more active and confident in using the language. And on the top of these, the learning activities allowed the students to learn the contents of mathematics and language in low – anxiety situation and interesting ways, as well as make the class more alive. In other words, the use of ICT in teaching mathematics can make the teaching process more effective as well as enhance the students' capabilities in understanding basic concepts of mathematics.

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