

## Contextual Application for wiki project education in Moodle 2.3

Norazah bte Yusof <sup>a\*</sup>, Shaffika bte Mohd Suhaimi<sup>b</sup>, Mohd. Shahizan Othman<sup>c</sup>, Dewi Octaviani<sup>d</sup>,  
Nadirah binti Mohamad<sup>e</sup>

*Faculty of Computing  
University Teknologi Malaysia  
Skudai - Johor Bahru, 81100 Malaysia*

---

### Abstract

Moodle 2.3 is the latest e-learning system which contains a lot of improvements of social learning features. One of the social learning features in Moodle 2.3 is Wiki. Wiki is a collaborative tool among users. Wiki is allowing users to have experiences of efficiency, flexibility, and it is cost effective. In addition, contextual application learning is able to help instructors to relate the subject matter to the real situation in collaborative and constructive manner. Current research has found that there is lack of usage in the e-learning system among users especially for Wiki tool. One reason is that the users are not aware with the capability of wiki to support interactive learning environment. This paper concerns about the initiative of Moodle 2.3 for contextual application in wiki platform. This paper also analyses the usage of wiki by observing the data log of the student action in Computational Intelligence course, offered at the Faculty of Computing, Universiti Teknologi Malaysia. From this analysis, we are able to determine the active and passive attitude among students. These findings hopefully can guide the instructors to improve learning strategies, specifically on wiki contextual application method. It is able to encourage students' participation and make them more ready for future field work.

*Keywords: Moodle 2.3 wike-education contextual application social interaction*

---

### 1. Introduction

Learning is the action of gaining information and transforming it into knowledge. Current technology makes learning more fun than in a traditional classroom. Web-based technology enables learning to be accessible in global scale, in which it is called as e-learning. E-learning exploits interactive technologies and communication system to improve the learning experience. It can raise the standard of learning and widen the students' participation in lifelong learning. It can also enhance the quality of teaching and maintain the pedagogy. The most popular e-learning used by users is Moodle. Moodle has been widely used in higher education institutions because it is free and allow the organization to create their own learning plan. The current Moodle version, Moodle 2.3 is well equipped with social learning features. These features encourage students to have active interactions within the learning context.

However, students become too comfortable with the technology since they become passive in the process of learning. Current research found that students use e-learning system to retrieve the course materials and not so much as a tool for learning. To develop an active learning environment, learning experience must encourage students to create and do, not just think. It involves students to represent the learning results by the domains applying and creating (West and West, 2009). For example, it involves activities such as experimenting, planning, mapping, designing, composing and integrating. In order to emphasize students' interest and experiences throughout all the learning process, contextual approach is applicable. Contextual approach also focuses on learning through experiencing, not by memorizing the context and learning content (Satriani, et al., 2012).

With the rapid development of web technology, web based learning become one solution or a method to improve learning performance of student via collaborative learning. One of the collaborative tools is wiki technology. Wikis require no software and allows fully editable content and also easily to accessible. It is also capable to the contributors to feel a sense of responsibility and ownership. Wikis are everywhere, but the online literature has not yet begun to focus enough on wiki (Mattison, 2003).

In order to develop the encouragement of accessing social learning tools in e-learning, incentives should be taking into account. Giving marks in online learning contribution is one of the most widely used strategies (Khee Foon and Wing Sum, 2012). However, instructor become a dilemma in giving equal mark to each student who works on the same project. They might have students who contribute more to work than who contribute less. Brown stated that the instructor should know the identity of the student who has done each piece of work (Brown, 2004).

This paper discusses about contextual application uses wiki in Moodle 2.3. As wiki becomes a feature in teaching and learning process, this paper explains how the Moodle wiki is used to engage students to achieve their learning goals meaningfully. This paper also discusses on how to determine the student's participation ratio of individual in a group as well as in course activity. Other than that, marking guideline is provided to assess students participation.

---

\* Norazah Bte Yusof. Tel.: +6-07-553 2341  
E-mail address: norazah@utm.my

## 2. Contextual Learning Application in Wiki Moodle

Learning is an action which permit people to participate successfully in future life and environment involved in future; working environment (Cross, 2004). Cross also mentioned that Aristotle had said learning activities are absorbed most by doing, and it is a source of learning. Traditional learning such classroom is the main medium used in delivering the information and knowledge. Years by years, many methods have been introduced to get students get engage more in the learning environment. In late 1990 when technologies arise, web 2.0 is widely used in internet platform. Web 2.0 allows web users to create and exchange information actively among them. It also allows the user to upload and download media files by offering the multimedia platform. These features motivate them to participate in web activities and therefor enhance active interaction among web user (Chen, 2007).

E-learning is a learning space where enable students to explore and expand the knowledge without any boundaries. It creates a learning platform without limitation of space and time. Previous e-learning systems were based on content and instructional method that delivered on computer; CD-ROM, intranet or internet. These systems focused on the skills and knowledge of the students in computer-aided platform (Clark, 2008). Nevertheless, this system is not suitable to complete the needs of technology web for learning. Current e-learning is introduced with the compliments from social media tools and social learning concepts features. The social media enable students to establish and communicate in online connection (Kim and Jeoung, 2010). Example of social media tools are blogging, wiki, tagging, instant messaging content management system and also forum. While social concept features enable students to achieve three situations in learning; [1] changing of individual understanding, [2] changing of the situation from individual space to communities and [3] involving social network and interaction (Reed, 2010). The social learning concept becomes an important role in learning when it achieved three main activities such as knowledge exchanging, exploring and sharing.

The most popular e-learning in Malaysia is Moodle (Embi, 2009). Moodle is developed on open source system so that it gives the authorities for the institution to design base on their teaching and learning based on institution desire. Moodle came with many version of e-learning application. Previous Moodle, which is Moodle 1.0, consumed as close system. However current Moodle 2.0 is known as an open system because it embeds with social interaction features (Othman et. al. 2011). One of the social interaction features in Moodle is Wiki. Wiki is a collaborative tool that collects and organizes content, created and revise by its user. Wiki can potentially build the community. In wiki environment, students could share and discuss their project ideas. They also able to post their course material, maintain forum, write collaborative projects and enable them to develop a glossary of important terms (Peterson, 2009). West and West (2009) have listed some learning paradigm that use wiki to assist students in their collaborative projects. They claim that wiki is able to assist the learner in knowledge construction, critical thinking and also contextual application. Each learning paradigm uses a different approach on wiki environment to help students in their project task.

Table 1. Wiki Project for Contextual Application

Item	Wiki Project for Contextual Application	
	<i>Applying</i>	<i>Creating</i>
1	Event planning	Story creation
2	Process map	Team challenge
3	Virtual science lab	Media design project
4	Field research project	Service learning project

Contextual application is formed from contextual teaching and learning (CTL) strategies which are relating, experiencing, applying, cooperating and transferring (REACT) (Crawford, 2001). Contextual application in learning is one way method to help students connect the content they learned to the life context. It's also motivates students to connect with the knowledge and engage it with the hard work that learning requires (Berns and Erickson, 2001). Contextual learning is based on the premise that learning and meaning emerge from the relationship between content and context. It is the context [the environment mentor problem] that gives meaning to the content (Johnson, 2002). Contextual teaching and learning engage students in significant activities — in rich learning environments — that help them connect their academic learning to real life situations and problems. Crawford (2001) also mentioned that contextual application learning is active learning, not a passive learning. In this process, students are more focus on discussing with peers about their strategies for solving problems instead of having the right strategy told by the instructors. Active learning is occurred when students get actively participate in the learning process (Bonwell and Eason, 2012). Students are involving in activities such as higher order thinking skills [analysis, syntheses and evaluation]. Based on these actions, students are able to construct personal knowledge through experimentation environment and problems solving. However, passive learning refers to students' action on listening to lecture, memorizing, rephrasing and also observing (Allen.

2002). Students and context are not simultaneously involved in a same time. Due to the important of active learning environments in contextual application learning, Sinha et. al (2009) it is vital to have students in vital engagement with the content. Thus, collaborative wiki learning environment is a useful learning platform for students to become active in contextual learning application.

### 3. Methodology

In order to measure the wiki capability in contextual application, some methodologies are applied. The course named Computational Intelligence, offered at the Faculty of Computing, Universiti Teknologi Malaysia, is selected as the sample. There are 34 students in the course. These samples are divided into 9 groups, in which each group consists of three to four students. They have to use Wiki Moodle 2.3 as the learning platform. Besides the students, there is the instructor whose role is to be the main person who assigned the class’s task and also responsible to monitor students’ participation.

First, the instructor gives some examples on how to write a good technical paper, which include the introduction, the methodology, as well as the result and discussion part. Then, the instructor requires students to produce a journal paper on the topic about fuzzy inference system. This paper should be based on the students reading and understanding about the fuzzy topic. They have to find, search and understand about the fuzzy topic, and they have to create a research paper base on their understanding by collaborating with their peers. The students have to produce a complete journal paper through the wiki tool of the e-learning system. In the future, these skills can be used to produce other kind of research papers.

#### 3.1. Contextual Application Interaction

In this work, contextual application method is used in Wiki Moodle 2.3 e-learning system as an interaction and collaborative tools. Figure 1 illustrates the interaction between each learner in the group to achieve task given. In this task, the instructor is giving to the group an assignment which is to describe Fuzzy inference System design. In this process, each member in each group is required to describe their own group project work. Each member must collaborate to produce a complete group task about fuzzy system.

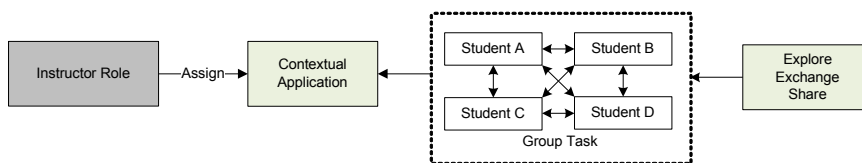


Figure 1. Contextual Application Interaction among students in Wiki Moodle 2.3

Figure 1 illustrates the interactions among students in performing the group tasks. When Student A is constructing his/her idea about the project, Student A is communicating, collaborating and cooperating with Student B, Student C and Student D. The students are interacting with each other simultaneously to produce the work. The skills involves are : exploring the context, exchanging the thought and sharing the benefits among group students. Throughout the process of creating the group tasks, students have full authority on the work done.

#### 3.2. Wiki Data Log

Other method to measure learner participation is by observing the data log on wiki activity. The log data in wiki e-learning is observed to monitor the active and passive participation attitude of learner performance. Table 2 presents the log information which lists students action in wiki. The wiki data log provides six attributes with information based on the wiki activity. The information is explained in Table 2.

Course	Time	Ip Address	Student Name	Action	Information
SCJ4553-01	2012 October 19 19:33	161.139.18.154	Student Ag	wiki view	35407
SCJ4553-01	2012 October 20 23:23	161.139.18.154	Student R	wiki view	35407
SCJ4553-01	2012 October 20 23:23	161.139.18.154	Student R	wiki view	35407
SCJ4553-01	2012 October 20 23:23	161.139.18.154	Student R	wiki view	35407
SCJ4553-01	2012 October 22 12:28	10.60.87.18	Student R	wiki view	35407
SCJ4553-01	2012 October 22 14:26	10.60.87.57	Student U	wiki view	35407
SCJ4553-01	2012 October 22 15:09	10.60.87.82	Student X	wiki view	35407
SCJ4553-01	2012 October 22 15:10	10.60.87.82	Student X	wiki view	35407
SCJ4553-01	2012 October 22 15:10	10.60.87.84	Student C	wiki add page	137
SCJ4553-01	2012 October 22 15:10	10.60.87.84	Student C	wiki view	137
SCJ4553-01	2012 October 22 15:10	10.60.87.82	Student X	wiki view	130
SCJ4553-01	2012 October 22 15:11	10.60.87.82	Student X	wiki view	130
SCJ4553-01	2012 October 22 15:11	10.60.87.82	Student X	wiki comments	130
SCJ4553-01	2012 October 22 15:11	10.60.87.82	Student X	wiki history	130
SCJ4553-01	2012 October 22 15:11	10.60.87.82	Student X	wiki map	130
SCJ4553-01	2012 October 22 15:11	10.60.87.82	Student X	wiki view	130
SCJ4553-01	2012 October 22 15:13	10.60.87.84	Student C	wiki edit	137
SCJ4553-01	2012 October 22 15:13	10.60.87.84	Student C	wiki view	137
SCJ4553-01	2012 October 22 15:14	10.60.87.82	Student X	wiki view	35407
SCJ4553-01	2012 October 22 15:14	10.60.87.84	Student C	wiki view	137
SCJ4553-01	2012 October 22 15:15	10.60.87.82	Student X	wiki view	130
SCJ4553-01	2012 October 22 15:15	10.60.87.82	Student X	wiki edit	130
SCJ4553-01	2012 October 22 15:15	10.60.87.82	Student X	wiki view	130
SCJ4553-01	2012 October 22 15:15	10.60.87.82	Student X	wiki comments	130

Figure 2. Wiki data log student for contextual application.

Table 2. Wiki data log information

Item	Moodle Wiki	
	Attribute	Explanation
1	Course	Course taken by the learner. - Course code and class
2	Time	Date: Date learner access wiki Time: Time learner access wiki
3	IP address	IP address of students' laptop or computer
4	User full name	Students' name
5	Action	Action occur while they access wiki - Add, edit, comment, view, history and map.
6	Information	Version page visited

Based on Liu and Meng, (2010) it is important to measure the amounts of students' action identify those who are active and who are passive. In order to identify students' participation level, we have to observe access hits from the wiki data log. However, we cannot rely on hits only to determine that learning has occurred. Hence, a weight is introduced to calculate the students' hit. The score weighting is used as an indicator to show the importance of the meaningful characteristics in the learning process. For wiki activities, there are six actions to be categorized into 2 types namely active and passive. Active students can be considered as students who construct the knowledge such as creating a new page, commenting and editing on the existing one. However, passive students are considered who do the browsing, accessing map and review the history.

Table 3: Wiki data log information

Action	Creating new	Make changes to the existing work for improvement	View and browsing	Does not reflect to learning process
Weight	3	2	1	0
Wiki action	Add Comment	Edit History	View	Map

The steps to determine the students' participation level either active or passive is stated below: First, the data log is sorted according to the wiki actions which are adding, edit, comment, view, history and map. Then, it classifies each action hits for each learner. Next, it counts the action score for each learner for active and passive action following the Equation (1):

$$Action\ score = \frac{\sum_{j=1}^n n_j \times w_j}{\sum n_j} \quad (1)$$

Where  $j$  is an action in Wiki data log  
 $h$  is the hits of each learner  
 $w$  is the weight of each action  
 $sum$  represents total

After we obtain the action score, the active and passive ratio for each learner participations are calculated as shown in Equation (2) and Equation (3).

$$(Active\ Ratio)\ y_A = \sum_{i=1}^n \left( \frac{x_i \times A}{sum_x} \right) \times 100\% \quad (2)$$

$$(Passive\ Ratio)\ y_P = \sum_{i=1}^n \left( \frac{x_i \times P}{sum_x} \right) \times 100\% \quad (3)$$

Where,  $i$  represents each learner in Moodle Wiki data log  
 $y$  is total ratio each learner  
 $x$  is the numbers of students' hit  
 $sum$  represents total

Ratio calculation is important to measure students' participation in a group and also for a whole class.

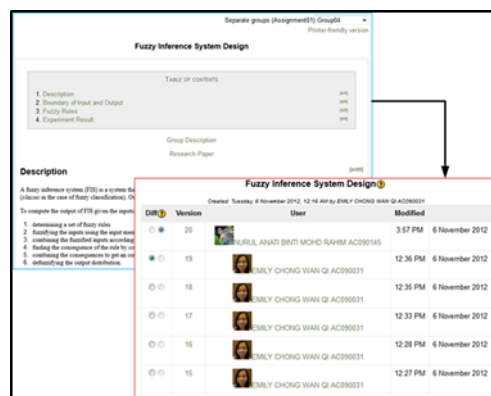
#### 4. Result and Discussion

Wiki Moodle 2.3 activity produces a 9 different group projects. Figure 3 shows the wiki page produced by the Group 4 Fuzzy Inference System Design task. Log history has been analyzed to identify students' participation in each group as well as in the whole class. The log data is retrieved to keep track of the students' activity in Wiki Moodle. The log has been sorted by the access hits on the wiki action. The hits are calculated into score which used to determine the active and passive score. Then, a graph is produced to determine the active and passive attitude. Figure 4 to Figure 11 show the graphs of the students' participation.

##### 4.1. Contextual Application learning process in Wiki Moodle 2.3

Wiki Moodle 2.3 activity produced a group project task; Fuzzy Inference System Design produced by students. Instructor is received 9 different works represent by each group. Figure 3 below show the wiki page produced a group project done by each group.

Figure 3. Contextual Application learning in WikiMoodle.



##### 4.2. Participation of individual in a group.

After the students have been sorted into their group, the score is calculated in Table 4. These scores use Equation (2) and Equation (3). The graph is produced to identify the students' participation level more clearly.

Table 4. Calculation for Wiki Data Log

Name	Value	3	2	3		1	0	2			
Student's Name	Group	Add	edit	Comm	Ratio	Total	View	Map	History	Ratio	Total
Student J	G1	3	16	6	37.88	66.00	32	0	1	30.84	107.00

Student U	G1	0	10	9	28.79	Ratio (%)	22	3	2	25.23	Ratio (%)
Student Ag	G1	0	6	0	9.09	9.94	27	0	0	25.23	5.98
Student Ah	G1	6	10	0	24.24		20	0	0	18.69	
Total		9	42	15	100.00		101	3	3	100.00	
Student R	G2	6	20	0	40.00	65.00	59	0	1	37.50	160.00
Student X	G2	3	22	4	44.62	Ratio (%)	66	1	1	42.50	Ratio (%)
Student Aa	G2	0	4	0	6.15	9.79	25	0	0	15.63	8.94
Student Af	G2	0	6	0	9.23		7	0	0	4.38	
Total		9	52	4	100.00		157	1	2	100.00	

.....

The graphs below are representing the students' participation level based on their own group.

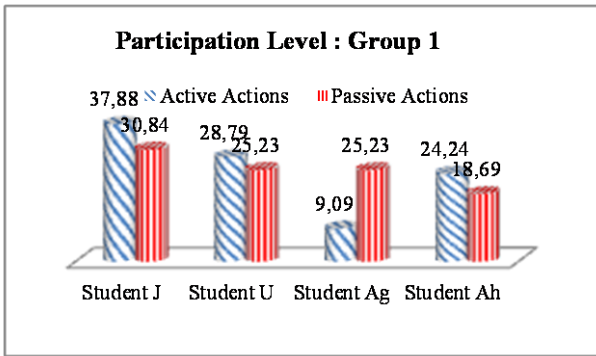


Figure 4. Level Participation for Group 1

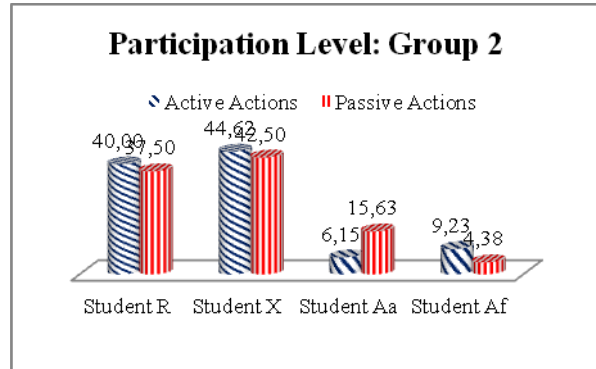


Figure 5. Level Participation for Group 2

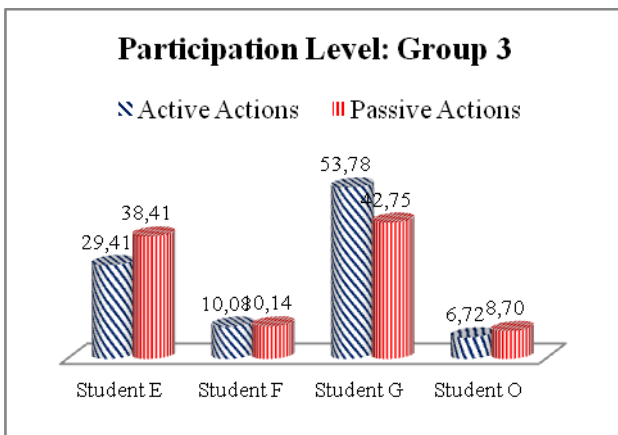


Figure 6. Level Participation for Group 3

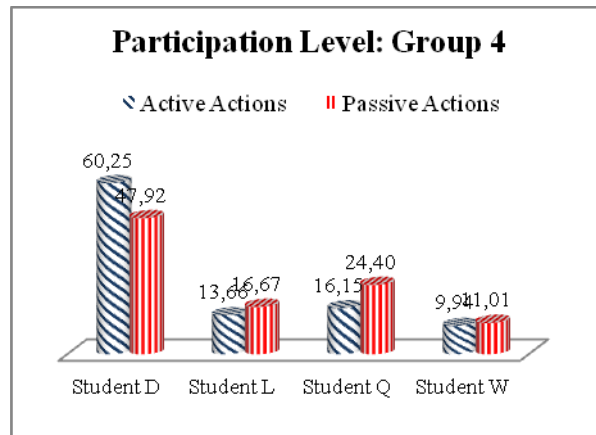


Figure 7. Level Participation for Group 4

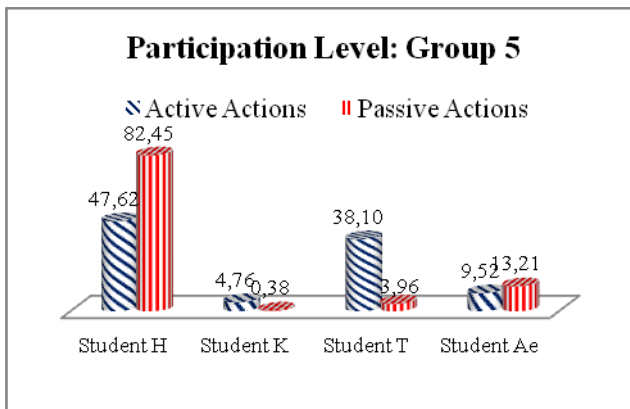


Figure 8. Level Participation for Group 5

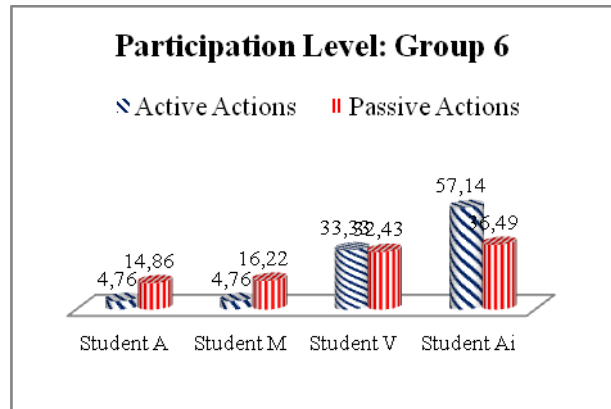


Figure 9. Level Participation for Group 6

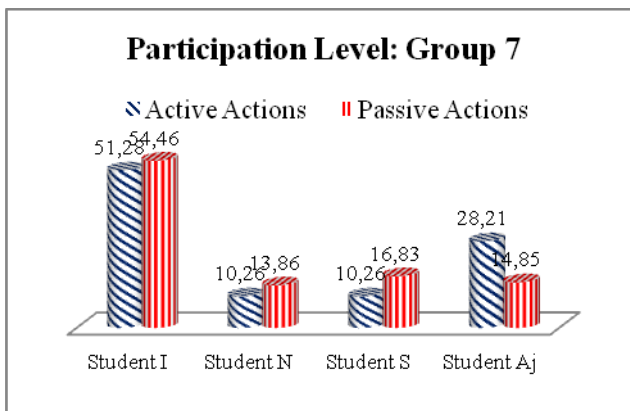


Figure 10. Level Participation for Group 7

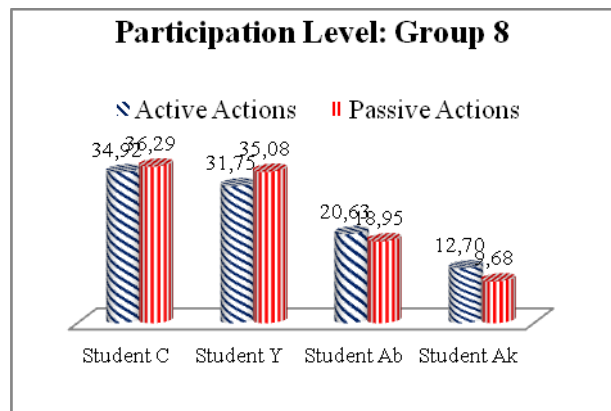


Figure 11. Level Participation for Group 8

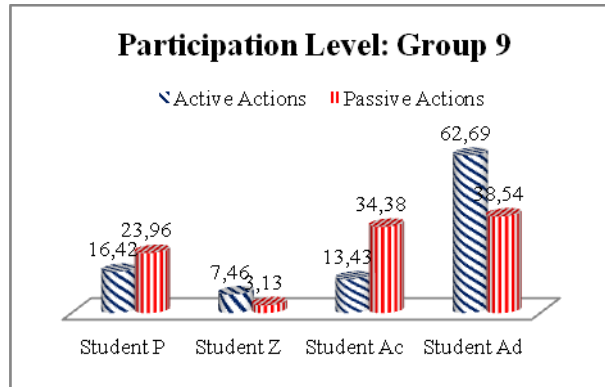


Figure 12. Level Participation for Group 9

Base on the figures, there are two groups which are Group 1 and Group 2 that show most of the students in the group are participating actively in the group task. Another four groups are participating moderately in their group. This mean that they have members who are active and passive. While other three groups which are Group 3, Group 4 and Group 7, there are two groups who have shown that most of the students in the group are passive participation.

4.3. Participation of the group in the class activity.

Participations from the whole class are important for the instructor to take further action. By producing the graph on the level of participation, helps the instructor to identify which group is not performing well in the task given. Instructor can motivate the group and encourage them to participate more to get the better result. Figure 12 shows that Group 4 is participated more both active and passive compared to other groups. Instructor has to focus on low participation level group, which is Group 6, and guide them to encourage the level of participation.

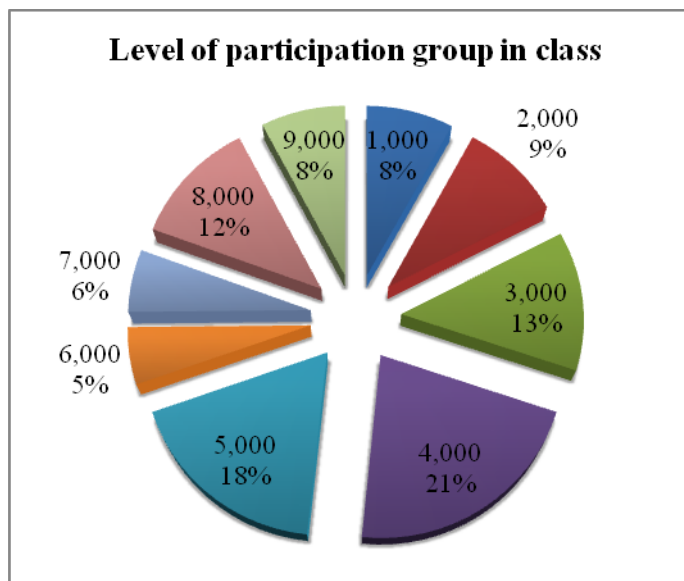


Figure 12. Participation of the group in the class activity



#### 4.4. Students Assessment based on the participation.

Assesment become important after the level of participation among students are identified. In this study, the researcher had identified two methods of assesment. Firstly, the instructor is able to asses group participation level. This is means, among the group members in a group, instructor can identify those who in low motivation of participation and those who are very high motivation of participation. Secondly, the instructor also is able to give a mark to those students based on their active and passive actions. From the action score in Table 4, it can become the evidence for the distribution of mark to each student. The issue of given equal mark may no longerger in a dilemma to the instructor how much mark to give to each student in a group.

## 5. Conclusion

This work presents a model of interaction used for contextual application in collaborative learning area. Wiki Moodle is a potential tool to engage students in the learning process. The analysis shown that the method used is successfully contributed to enhance learning performance; active and passive. Students can be identified as active and passive. Instructor also is able to identify which students need to be focused more. Other than that, instructors also can categorize which group has performed as very active and which group are not. Instructor can prepare strategic lesson plan to cope the passive issue among students. These findings can become the guideline for the instructor to assess student's participation.

## Acknowledgements

The authors would like to thank Ministry of Higher Education (MOHE) and the Universiti Teknologi Malaysia (UTM) for their financial support under Exploratory Research Grant (ERGS) vote number R.J130000.7828.4L064.

## References

- Allen, M. (2002). E-learning - Discovering learning: repurposing an old paradigm. 2002. Retreive online on Jan 2013 at: [http://www.elearningpost.com/blog/e\\_learning\\_magazine\\_discovery\\_learning\\_repurposing](http://www.elearningpost.com/blog/e_learning_magazine_discovery_learning_repurposing).
- Berns, R. G., & Erickson, P. M. (2001). Contextual teaching and learning: Preparing students for the new economy. National Dissemination Center for Career and Technical Education.
- Bonwell, C. C., and J. A. (2013). Eison. Active learning: Creating excitement in the classroom. ASHE-ERIC Higher Education Report No. 1. Washington, DC: George Washington University Clearinghouse on HigherEducation. Accessed Januari 2013. Archived at <http://www.webcitation.org/5W15FQQh7>.
- Brown, S. (2004). Assessment for Learning. Learning and Teaching in Higher Education, Issue 1.
- Chen, Y., C. (2007) , Wiki Technology as a Scaffolding Tool in Education. Ninth IEEE International Symposium on Multimedia Workshops. Helsinki, Finland.
- Clark, R. (2008). Six principles of effective eLeaning- what works and why: Best of the eLearning Guild's Solution. Pfeiffer a Wiley Imprint: United States.
- Crawford, M., L. (2001). Teaching contextually: Research, rationale, and techniques for improving student motivation and acheivement in mathematics and science. Texas: CCI Publishing, Inc.
- Cross, J. (2004). An informal history of eLearning. On the Horizon .Volume 12 · Number 3 · 2004 · (pp. 103-110). Online source: [www.emeraldinsight.com/1074-8121.htm](http://www.emeraldinsight.com/1074-8121.htm).
- Embi, M. A. & Adun, M. N. (2010).e-Pembelajaran di IPTA Malaysia. Pusat Pembangunan Akademik Universiti Kebangsaan Malaysia, Jabatan Pengajian Tinggi Malaysia.
- Johnson, E. B. (2002) Contextual teaching and learning: What it is and why it ' s here to stay . Thousand Oaks, CA : Sage .
- Khe Foon. H., Wing Sum. C. (2012). Student Participation in Online Discussions: Challenges, Solutions, and Future Research. Springer.
- Kim, W., and Jeong, O., R. (2009). On social e-learning. International Conference on Web-based Learning, Aachen, Germany.
- Liu,H., Y., and Meng, X., J. (2010). Research on network teaching platform based on knowledge construction teaching model. In 2nd International conference on education technology and computer (ICETC), Shanghai.
- Mattison, D. (2003). "Quickiwiki, Swiki, Twiki, Zwiki and the Plone Wars Wiki as a PIM and Collaborative Content Tool." Searcher 4(11): 32-48.
- Othman, M. S., Mohamad, N., Yusuf L. M., Yusof, N. and Suhaimi S. M. ( 2012). An Analysis of e-Learning System Features in Supporting the True e-Learning 2.0. Proceedia - Social and Behavioral Science 56. p: 454-460. International Conference on Teaching and Learning in Higher Education (ICTLHE 2012) in conjunction with RCEE & RHED, Negeri Sembilan.
- Peterson, E.(2009). Using a Wiki to Enhance Cooperative Learning in a Real Analysis Course, PRIMUS: Problems, Resources, and Issues in Mathematics Undergraduate Studies, 19:1, 18-28.
- Reed, M. S., A. C. Evely, G. Cundill, I. Fazey, J. Glass, A. Laing, J. Newig, B. Parrish, C. Prell, C.Raymond, and L. C. (2010). What is social learning; Ecology and Society. Stringer. [online source]. URL: <http://www.ecologyandsociety.org/volXX/issYY/artZZ/>.
- Satriani, I., Emilia, E., and Gunawan, M. H. (2012). Contextual Teaching and Learning Approach to Teaching Writing. Indonesian Journal of Applied Linguistics, Vol. 2 No. 1, ( pp. 10-22).
- Sinha, N., L. Khreisat, and K. Sharma. (2009). Learner-interface interaction for technology-enhanced active learning. Innovate 5 (3). The Fischler School of Education and Human Services at Nova Southeastern University. Online source: <http://www.innovateonline.info/index.php?view=article&id=622> (accessed January 2013).
- West, J., and West, M., L. (2009). Using wikis for online collaboration. Online e-book. Wiley Imprint.