

*“Knowledge Diffusion”: Developing Appropriate Approaches to Knowledge Transfer  
in Thai Rural Communities: A Case Study by King Mongkut’s  
University of Technology Thonburi (KMUTT)*

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Abstracts

KMUTT is involved in many rural community development projects in Thailand. The purpose of these is to convey knowledge directly to local communities through short events such as workshops, conferences and projects. However, research suggests that only little of this overall knowledge has been adopted effectively. We hypothesize that this is due to differences in lifestyle, expectations and motivation between urban researchers and rural communities. Therefore, this study aims to determine an approach to knowledge transfer that is appropriate for rural communities. The study is based on participation observation of a particular community project. In this, a series of short events grounded in local lifestyles was created as a research tool. In these, researchers adopted the position of role-models working to diffuse knowledge rather than directly influence local community life. Using this approach, the reaction and feedback from rural people about knowledge accessibility seems much improved. The result suggested that an appropriate approach to rural knowledge transfer should emphasize local “lifestyles” and researchers adopt a role model based on the diffusion of knowledge rather than direct influence. In this way, people in rural communities might be given the opportunity to sub-consciously adopt knowledge diffuse this effectively for use in rural community development.

Keywords: Community Development, Knowledge Diffusion, Urban Researcher, Rural Community

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## **Introduction**

King Mongkut's University of Technology Thonburi (KMUTT) is located in Bangkok, Thailand. KMUTT is involved in many rural community development projects in Thailand. The purpose of these is to convey knowledge directly to local communities. Researchers work as facilitator to find appropriate technologies to mainly increase agriculture productivity and also pull experts to help on social problems, such as drug abuse. KMUTT also indoctrinates the knowledge and mechanism of building co-operation of local organizations. It is coherent with the success factors of community development project mentioned by Akin (2009). Nongluck (2012) presented that the social worker should works as enabler in the community by stimulating via creating activities to pull co-operation from the community for basically maintaining security, development, and relationship between each organization in the community.

## **Problem Statement**

According to different contexts of urban and rural community, urban researcher and rural people lifestyles are different as well. Rural community is traditionally, patron-client system, where people focus on relative system and land ownership. It relates to an expressive friendship (Wolf, 1887, cited in Akin, 2009) formed between the persons or groups who have same form, characteristic, or attitude. It is totally different from the urban lifestyle which related to economics system and instrumental friendship that focusing on personal benefit (Akin, 2009).

The problem is, nowadays, many urban researchers still have stereotype of people in rural communities as uneducated, and credulous (Pracha, 2011). It is why many urban researchers use an "influence" approach for knowledge transfer projects. Influence is same as an approach that urban people in Thailand are influenced by western. In this case, it seems that urban researchers set themselves into the middle of western and rural people. They are influenced by western and, at the same time, they also influence rural communities. However, focusing on knowledge transfer approach which is naturally happened in rural community, it is diffusion approach instead of influence approach. Knowledge is normally diffused from one to one or one to group via the lifestyle activities.

During the study of Community Life Museum development at Nagnoy and Poneplaloh community, Sakolnakorn province, north-east of Thailand, where KMUTT has involved in

community development for more than ten years, it was found that only little of this overall knowledge has been adopted effectively. The hypothesis is due to changes and differences in lifestyle, expectations and motivation between urban researchers (KMUTT) and rural community (Nagnoy and Poneplaloh). Therefore, this study aims to determine an approach to knowledge transfer that is appropriate for rural communities.

## Methodology

The study is based on participation observation during one community development project. In this, paralleling with data collection of this project, a series of short events grounded in local lifestyles was created as a research tools. However, in traditional Thai culture, rural people pay much respect to urban researcher which showed the role of urban researchers, is always considered by rural people as an influencer. The study suggested that, as children in the rural community are considered as a non-leader in the rural community point of view. In this study, researchers trained a group of children to adopt the position of role-models working to diffuse knowledge rather than directly influence local community life.

The series of activity in religious ceremony preparation is considered as a local lifestyle activity. In the activity, new knowledge for solving problems, which were happened in religious ceremony preparation activities, was directly transferred to children by researchers. Urban researchers played as facilitators to ground the particular lifestyle activities encouraging children to diffuse knowledge to people in the community.

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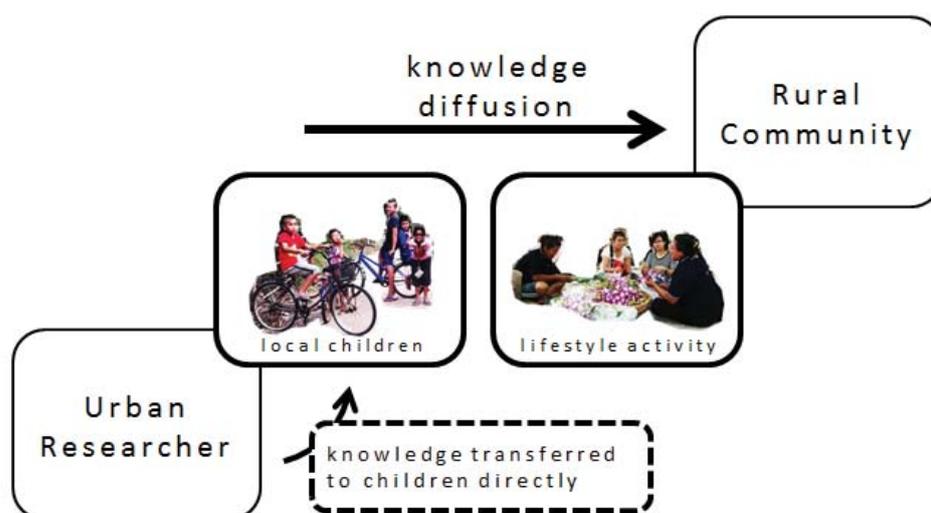


Figure 1: The conceptual framework at field work

## Result

From the observation, adults normally give children assignments. In this case, assignments are considered to be as immediate needs of social. However, when the children finished the assignments completely by using the computer (Represented as new knowledge), they did not accept children's competence immediately. Until a certain number of successes, they basically tried on computer (New solution and knowledge) by themselves. The observation showed that, in case they cannot use computer, the requests were sent to children indirectly. In this kind of situation, the knowledge was diffused from children, who are smaller, in term of social status, to adult sub-consciously.

After observation interview, the result showed that people did not note on helps from children. They think that children, as a new generation, must have this kind of knowledge (Computer). They also thought that if children can do it, they can do it too. Comparing to the previous situation, with the same content (Computer training), they denied training and knowledge provided from the social workers. The reasons, in that time, are such as "It is not necessary for my life" and "You can do it because you are from urban, I cannot do as you". So using diffusion approach, the reaction and feedback from rural people about knowledge accessibility seems much improved.

## Discussion

In 2009, Akin presented the story from his experience in one community: *When the rich person in community was interviewed by urban reporter, he told that "I am rich because I have been working very hard". On the other hand, when he was asked from the people in the same community, his answer is "I am rich because of the power from super natural"*. The case study showed that people in the rural community customize the contents following the characteristics and expectations of the interlocutors. This story explains why urban researchers think that people in the community can adopt the knowledge they provide.

It is same as the observation in field work. At the community meeting, the official village leaders and government officers always explain government policy to the community's members (rural people) by influence approach. It is the same approach that they were influenced by urban center. In this case, leaders and officers set themselves at the middle between urban center, who influence them, and community's members, whom they are

influencing. Community's members might act as Akin's story mentioned above. To maintain relationship and benefits, members might customize an answer to show their intention and understanding to outside.

Influence approach is mostly used for driving urban society to be "beyond their lifestyle". In the urban society, the relationship of members is depended on the purposes. Therefore "role-model" in the urban society represents as presenter influencing society members to be like him/her. By this approach, it seems that "beyond lifestyle" is presented by focusing on "semiology of culture". Instead of focusing on function, influencing of role-model tries to present the concept of social and culture value of objects or activities (Wanpimon, 2001). Tonnies (1887, cited in Akin, 2009) hypothesized the community movement direction. The traditional community which is formed naturally by the relative system is possible to be replaced by society, which is rationally depended on purposes. Akin (2009) presented that, in fact, a group of people in the real situation are between traditional community and modern society. It is depended on the level of *Gemeinschaft* and *Gesellschaft* in each group.

According to literatures, it can be compared to the present situation in Thailand. At rural communities, numbers of organization focusing on purposes such as, learning centers, small and micro community enterprises, one tumbon one product (OTOP), or even factories, are increasing significantly because of development policies of government. These kinds of organization are systematically set by the government (urban people). It normally works efficiently at the beginning because communities are forced by government. However, many organizations, in the rural communities, are not working as they should and knowledge is not adopted effectively at the communities as well. Communities might be influenced to accept things and their social values of them at the beginning, but they also can rationally cut unnecessary things which are not matched to their lifestyle. It is coherent with the suggestion from Weber (Cited in Akin 2009). He mentioned that in the history, the proportion of rational action, compared to non-rational action, of human has kept increasing significant. At the present, this change is not depended on agrarian transformation as in the past but it might be rural restructuring. The lifestyle of rural community has been changed especially, consumption. They do not consume just only food but also others such as satisfaction, meaning, knowledge, and ideology (Anan, 2009).

Nongluck (2012) suggested that social worker must understand the lifestyle of community members including culture and tradition. Carl Roger (cited in Nongluck, 2012) mentioned

that one of characteristics that everyone has is lifestyle, the combination of value, attitude, habit, and also the mechanic which is used to resist their worries. In the context of Thailand, at B.A.D. Award 1995, Panu (cited in Pracha, 2010) presented that the gap between urban and rural lifestyle was increased. However, lifestyle is not limited as visual. It should be included as feelings, or situations which can be understood and involved by only people who own that lifestyle.

Focusing on context of knowledge transfer in Thai rural communities today, the result suggested that an appropriate approach to rural knowledge transfer should more emphasize local “lifestyles” and researchers adopt a role model based on the diffusion of knowledge rather than direct influence.

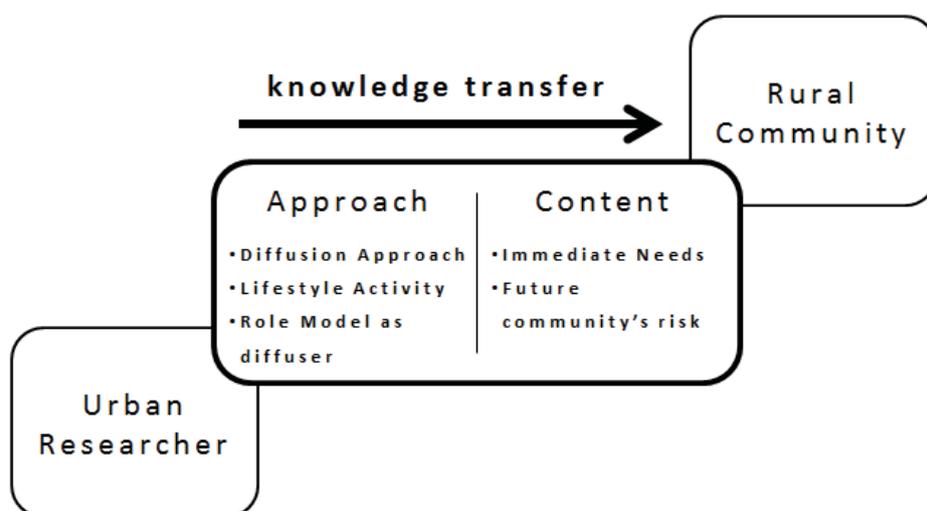


Figure 2: The conceptual of appropriate approach of knowledge transfer

In case of researchers are much respected from the communities' members, a role model based on the diffusion approach might be needed. In this way, people in rural communities might be given the opportunity to sub-consciously adopt knowledge diffuse this effectively for use in rural community development.

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6

*Effectiveness of Criteria for Pair Combination and Obstructive Factors of Pair Work in  
Computer Literacy Education*

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Since 2008, we have introduced a pair approach in the university's computer literacy education with the aim of establishing the pair work, which is effective in addressing computer literacy gap. The previous report focused on the pair learning effect from the amount of utterances, and it revealed that paired cooperative problem solving improved the overall task achievement level and suggested that mixed-gender pairs with similar academic ability were highly effective as the combination of criteria.

To affirm the suggested combination of criteria and to find the obstructive factors of pair work, this study shows the result of pairs in the problem-solving class conducted in a computer literacy program in two private universities in Japan, in 2011. A total of six classes and approximately 280 students were examined to see the effectiveness of the criteria for pair combination by comparing the experimental group (the criteria combination pair) with the control group (the random combination pair). The task achievement and the amount of utterances of the experimental group were overall higher than those of the control group. From the survey, it was observed that the criteria for pair combination were effective.

Conversely, high basic academic ability and male pairing were the factors that highly affected the negative effect of pair work.

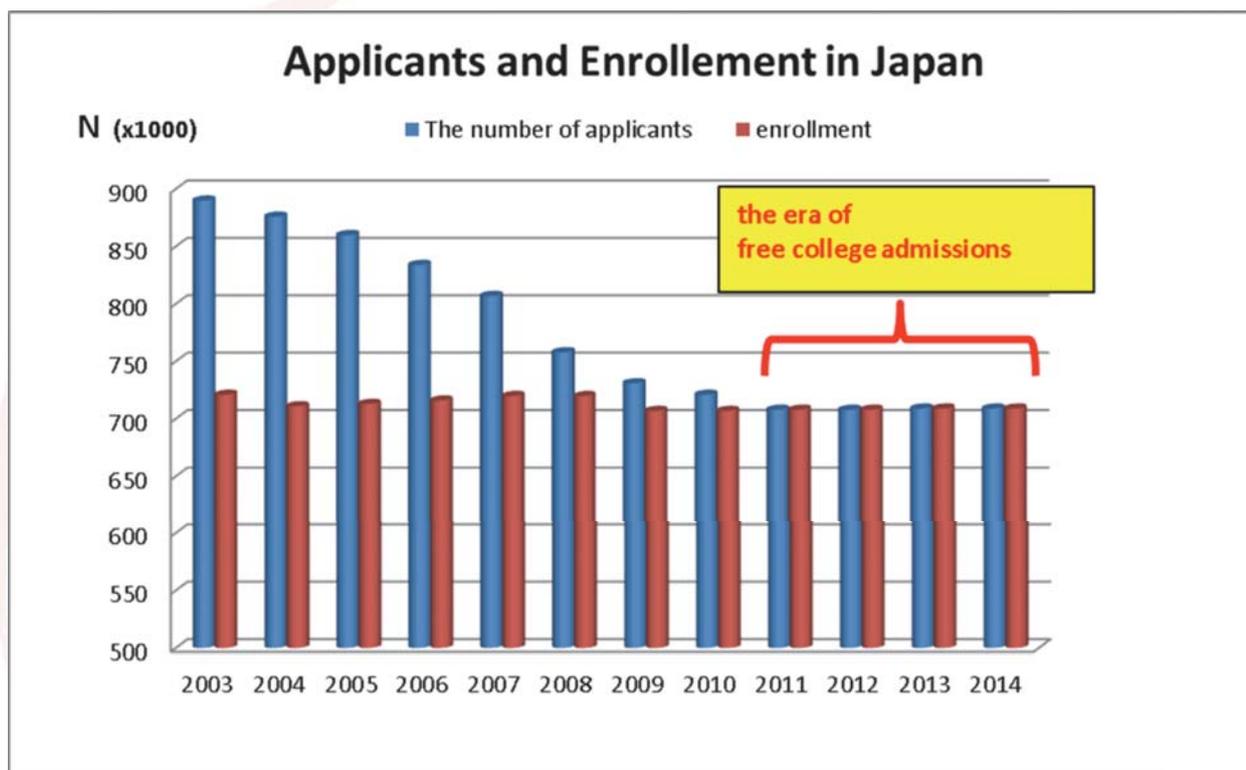
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## 1. Introduction

With As a movement in the educational field, there is a need to improve skills necessary for the 21st century, such as the ability to learn independently, problem solving skills, and communication (Iiyoshi, 2009). Higher education now emphasizes the importance of communication and cooperation skills, advocating a shift toward participatory approaches to instruction and, in many cases, practical studies to support these shifts. The cooperative learning approach, such as pair learning, particularly stimulates a desire for learning and is reported to correlate with improvements in communication and cognitive abilities, intrinsic motivation, and



**Fig.1 The era of free college admissions in Japan** ( after MEXT report ,2006 )

autonomy. However, newly enrolled university students show a growing computer literacy gap because of the rapidly changing environment in information technology and the great disparity between university computer literacy education and high school courses. Further, as the era of free college admissions will be arriving in Japan (Fig. 1), students have a weaker sense of purpose and less motivation to do coursework, thereby making traditional teaching approaches ineffective.

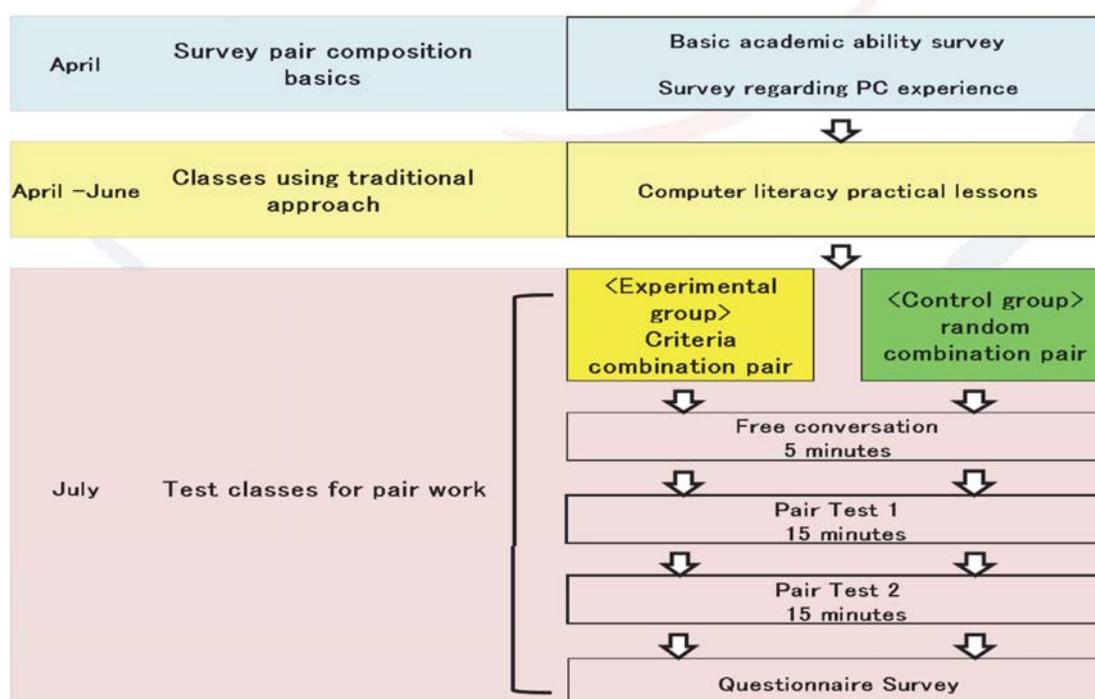
Given this educational context, we have made attempts to introduce pair work into university computer literacy education since 2008, conducting research to develop a pair approach adaptable to the expanding literacy gap. The reason for the particular focus on pair learning within group learning approaches is focused for the following reasons: 1) it is easy to build relationships with the first person to encounter; 2) it is less likely that the leader does all the work, a common problem with group approaches; 3) it is less likely that

participation varies between individuals; 4) it promotes active participation that develops one-on-one learning; 5) larger groups exhibit more complex groupings; and 6) pairs are generally more flexible because they are the smallest unit for a group learning approach.

Our previous study (Oya & Uchida, 2011) focuses on the communication process during pair work, analyzing the effects of the number of utterances, and the character count of the utterance. Although the results of that study demonstrated that pair learning approach is an effective solution to information processing problems, their effects were low or null, depending on the number and pattern of utterances, the percentage of correct responses, and time constraints. The present study validates methods that use pair combination indicators as a solution to address these issues. This study's results consider the relationship between the number of utterances and the learner's specific traits as moderated by the pair effect.

## 2. Method

The subjects of this study were enrolled in a computer literacy program in 3 departments of 2 private universities in Aichi Prefecture. A total of 7 classes and about 280 students participated in 2011. In April, students were surveyed on pair combination criteria, namely basic academic ability and PC experiences (Fig. 2). The basic academic ability survey consisted of 20 math and kanji (Japanese character) problems. The survey on computer experience before university had 20 multiple-choice questions about the Internet, software, and computer usage inside and outside the high school. The survey time lasted 5 minutes and



**Fig.2** Flow chart of the research process

surveys were collected individually for each participant. After 8–10 practical computer literacy classes, students were tested (Test 1 and Test 2) in pairs for 15 minutes (22 questions) based on word-processing proficiency such as, “please use ‘30’ characters and ‘35’ lines on one page,” and “please center align page numbers in the footer.” Before the pair test, students were given five minutes for free conversation to develop smooth communication for each pair’s first encounter. Thirty five minutes of conversation was recorded from the time free conversation began to the end of the pair test.

Pairs remained unchanged for both Tests 1 and 2. Therefore research, so far, has identified several obstructive factors to the pair learning effect: lack of communication between pair members, tendency toward lengthy conversations, and time constraints. The teacher warned the students about these obstructions before beginning the test and five minutes before its end. Immediately after the test, students responded to a five-minute survey about the pair test.

To evaluate the validity of the two indicators for pair combination, basic academic ability gap and gender, as identified in our previous study, the class was arbitrarily divided by each university class unit. The experimental group pairs were assigned according to matching characteristics based on the above indicators, the rest were randomly assigned to the control group.

To make pairs in the experimental group, we sorted the student in order to basic academic ability score at first (Fig.3). After that we combined pairs from top in order. At that time, if this happens the same sex, we tried to change the combination to make a mixed gender pair of as many as possible. Then the experimental group consisted of opposite genders having a minor gap in basic academic ability.



Fig.3 Method of combination for the experimental group

### 3. Results of the Analysis

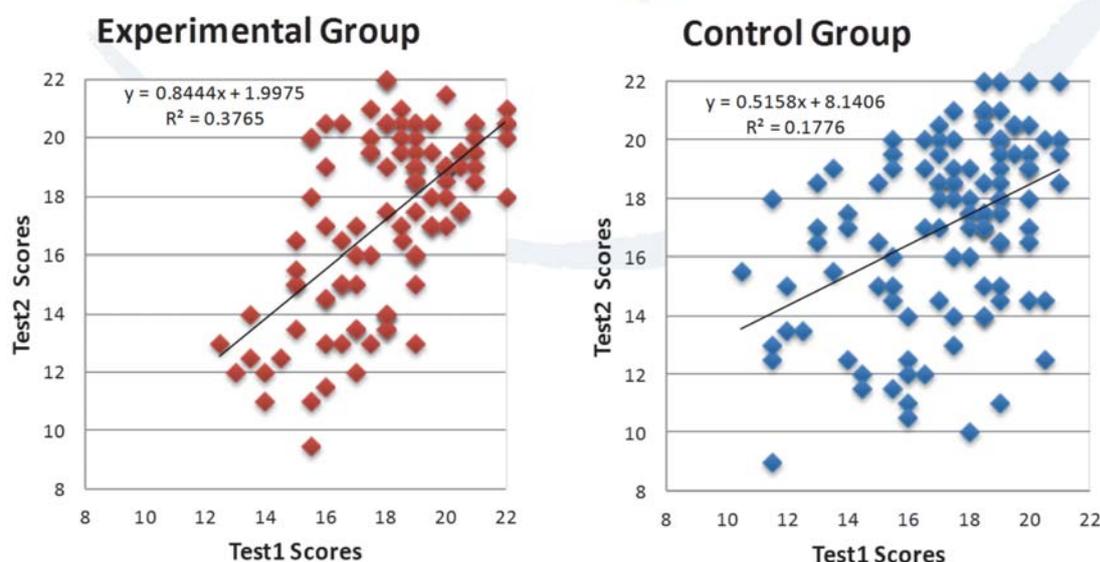
#### 1) Indicators for Pairs and the Pair Learning Effect

The analysis considers whether there was a divergence in pair test scores and the number of utterances between the experimental group, where pair combinations had been assigned with matching indicators, and the randomly assigned control group. Results reveal that the experimental group's average scores were higher than those of the control group by 0.79 for Test 1 and 0.30 for Test 2 (Table 1). Test 1 showed a significant difference between average scores with  $p = .01$ , but Test 2's result was not significant. The range of test scores between Tests 1 and 2 (Test 2 Score – Test 1 Score) differed significantly with  $p = .05$ .

**Table 1** Score and amount of utterances in each group

		Experimental Group			Control Group			$\rho$
		<i>ne</i>	<i>me</i>	<i>s.de</i>	<i>nc</i>	<i>mc</i>	<i>s.d.c</i>	
Test score	Test1	104	18.02	2.20	110	17.24	2.49	0.008 **
	Test2	109	17.22	3.08	116	16.92	3.03	0.233
Amount of Conversational Utterance	Test1	96	157.6	30.19	100	136.8	44.19	0.028 *
	Test2	96	126.0	32.00	102	121.2	43.78	0.266

Examining the score distribution of each pair for Tests 1 and 2, although there was a positive correlation between both tests' scores, overall, there was some variation in the experimental group, and a higher percentage of control group pairs had higher scores in Test 2 (Fig.4). The number of utterances was higher



**Fig.4** Distribution of scores in each group

for the experimental group in both tests, particularly for Test 1, with a significant difference of 5%, a similar outcome to that of the scores. The number of utterances' range (the number of Test 2 utterances – the number of Test 1 utterances) had similarities with the range of test scores; the experimental group made fewer utterances in Test 2. Further, two pairs in the control group failed to establish communication, whereas all experimental group pairs established communication. A significant difference of 1% was observed in six out of 11 questions between the experimental and control groups in the post-test questionnaire survey results. The question, “do you think the pair learning approach is good?” had the largest difference. The experimental group’s significantly higher positive response suggests that the indicators for pair combinations were effective. For questions like “did you consult your partner?” “Were you able to interact with your partner on the pair test?” “Did you find consulting with your partner helpful?” and other questions relating to the exchange between partners, the experimental group responded with higher ratings (Table 2). This outcome is consistent with the experimental group’s scores and number of utterances being higher than those of the control group. However, given that the survey did not show a significant difference in the number of utterances, nor did it in Test 2 scores, results suggest that the experimental group evaluated pair work as effective.

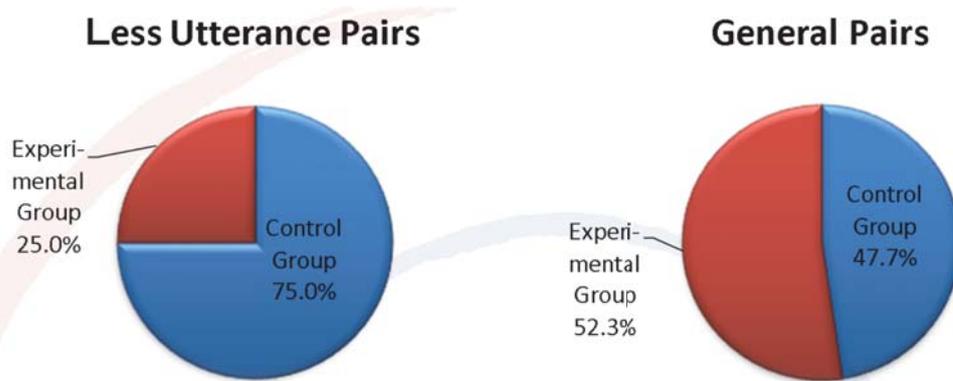
**Table 2 Results of questionnaire in each group**

	Experimental Group			Control Group			$\rho$
	<i>ne</i>	<i>me</i>	<i>s.de</i>	<i>nc</i>	<i>mc</i>	<i>s.d.c</i>	
Do you think the pair learning approach is good?	110	<b>2.88</b>	0.32	115	<b>2.63</b>	0.57	0.000 **
Did you consult your partner?	110	<b>2.82</b>	0.41	115	<b>2.52</b>	0.74	0.000 **
Were you able to interact with your partner on the pair test?	110	<b>2.72</b>	0.51	115	<b>2.49</b>	0.63	0.001 **

## 2) Relationship between pair learning effects and the number of utterances

As So far, research has demonstrated a correlation between the number of utterances and the pair learning effect. It has also shown that a decrease in the number of utterances has a significant impact on the pair learning effect. This study specifically targeted pairs with a low number of utterances in the pair learning approach. Specifically, analysis examined the relationship between each factor. Group L contained 12 pairs

with fewer than 100 utterances, considered to be low; Group G contained the remaining pairs with over 100 utterances. Group L composed of 75% of the control group and 25% of the experimental group (Fig.5), suggesting that the indicators for pair combination proposed by this study are effective in encouraging communication between pairs. Group L contained more male pairs, supporting the findings in previous studies that males converse less than females.



**Fig.5 Proportion of each group in less utterance pairs**

There was no significant difference between the groups' basic academic ability gap or PC experience before they joined the university; however, Group L exhibited a significantly higher basic academic ability (Table 3). This may reflect a learning attitude that is characteristic of students with a high basic academic ability, who attempt to solve problems independently. There was no significant difference in the test scores. However, Group L had marginally higher values for Test 2. This result is attributed to Test 2's greater difficulty level, wherein, Group L pairs having had to sacrifice conversation time to ensure having sufficient time to answer the questions. The survey results revealed a significant difference for seven questions for Group G. The amount of consultation scored the highest t value, presumably because the students in Group L realized that there was little communication between pairs. Moreover, a significant difference was recorded for factors like the effectiveness of pair interaction and the topics consulted, which clearly showed that they felt that the pairs were ineffective.

**Table 3 The values of pair combination criteria in less utterance pairs**

	Less Utterance Pairs			General Pairs			p
	<i>n</i>	<i>M</i>	<i>s.d</i>	<i>n</i>	<i>M</i>	<i>s.d</i>	
<b>Basic Academic Ability</b>	23	<b>12.28</b>	2.92	171	<b>10.49</b>	3.35	0.008 **
<b>PC Experience</b>	22	<b>11.77</b>	4.34	168	<b>12.14</b>	4.24	0.351
<b>Basic Academic Ability gap</b>	24	<b>2.81</b>	1.24	170	<b>2.54</b>	2.55	0.303

#### 4. Conclusion

The Students were divided into two groups, a experimental group where pairs were assigned with matching indicators and a control group where pairs were assigned randomly. They were then given a pair test for computer processing in an experimental class setting. Analysis of the comparison of both groups' tests and surveys, particularly focusing on pairs with fewer utterances, yielded the following results:

- 1) The experimental group had higher test scores than the control group and a greater number of utterances, which suggests that the indicators for pair combination proposed in this study are generally effective;
- 2) When the results of the control and experimental group surveys were compared, the experimental group's responses were higher to the questions about preference for the pair approach, partner interaction, amount of consulting, and topics consulted, confirming the pair work effect based on the pair combination indicators;
- 3) In Group L, which had fewer utterances, 75% of mostly male members came from the control group. Furthermore, although Group L was not characterized as having computer experience before university level education, their basic academic ability was significantly higher; and
- 4) When comparing the survey results of Group L and Group G, for 7 out of 11 questions, Group L responded with significantly lower values than Group G, suggesting that Group L did not actively participate in pair work.
- 5) These results suggest that high academic ability and male pairing were the factors that highly affected the negative effect of pair work.

Further investigation will be conducted on the characteristics of pairs with fewer utterances and the utterances' content. Actionable items must be identified to improve the overall pair effect in education.

#### Supplementary Notes

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