IMPLEMENTION OF BILINGUAL WORKSHEET WITH MIND MAPPING STRATEGY BY COOPERATIVE LEARNING MODEL ON ATOMIC STRUCTURE AND PERIODIC TABLE MATTER

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Abstrak

Penelitian ini bertujuan untuk mendeskripsikan aktivitas guru, aktivitas siswa, hasil belajar siswa, dan respon siswa terhadap implementasi LKS bilingual berstrategi *mind mapping* dengan model pembelajaran kooperatif pada materi struktur atom dan tabel periodik. Jenis penelitian ini adalah penelitian pre-eksperimen (*non-designs*) dengan *one group pretest posttest design,* yaitu eksperimen yang dilaksanakan pada satu kelompok saja tanpa kelompok pembanding. Persentase rata-rata hasil observasi keterlaksanaan sintaks model pembelajaran kooperatif dengan strategi *mind mapping* pada pertemuan I sebesar 87,9% (baik sekali) dan pertemuan II sebesar 82,7% (baik sekali). Persentase total hasil pengamatan aktivitas siswa yang relevan pada pertemuan I sebesar 100% (baik sekali) dan pertemuan II sebesar 100% (baik sekali). Hasil belajar siswa menunjukkan kenaikan rata-rata dari *pretest* 47,50 menjadi 75,56 pada *posttest* dengan jumlah tim super sebanyak 11 kelompok dan tim hebat sebanyak 7 kelompok. Pada *pretest* terdapat sebanyak 83,33 % atau 30 dari 36 siswa tidak mencapai ketuntasan kemudian turun menjadi menjadi 27,77% atau 10 dari 36 siswa pada saat *pottest*. Perhitungan menggunakan SPSS uji *Paired-Samples T Test* menunjukkan bahwa perlakuan yang diberikan tergolong efektif. Respon siswa positif setelah impementasi dengan rata-rata jawaban "ya" 95,5% dalam kategori sangat baik.
Kata Kunci: *bilingual,* kooperatif, LKS, *mind mapping*, struktur atom, tabel periodik.

Abstract

This research have objective to describe teacher activity, student's activity, student's learning result, and student's respond due to implementation bilingual worksheet with mind mapping strategy for subject atomic structure and the periodic table. The kind of research is pre-experiment (non-designs) by one group pre-test and post-test design, which is experiment that execute on one group only without compare group. Percentage of cooperative learning with mind mapping strategy's syntax that has been done on first meeting is 87,9% (very good) and second meeting is 82,7% (very good). Total percentage of student activity observation that relevant on first meeting is 100% (very good) and second meeting 100% (very good). The student's learning result show increasing average from pretest 47,50 become 75,56 in postest with the amount of super team 11 group and great team 7 group. In pretest there just 16,66% or 6 from 36 students that reach mastery learning and then increase in postest with 72,22% or 26 from 30 students. Calculation by SPSS with Paired-Samples T Test show that threatment that was given is effective. Student's respond after implementation is positif with average of "yes" answer 95,5% in very good criteria.
Keywords: *atomic structure, bilingual, cooperative, mind mapping, periodic table, student worksheet.*

INTRODUCTION

Globalization era that quick everywhere wether want or not has created strict competition within each nation. Nation that have the ability to compete will rise, in other hand, nation that do not have the ability to compete will fall. One of main factor that can increase the ability to compete of nation is the mastery of foreign language that can be used internationally and the developed of human resources.

One of the government's efford in order to developed human's resources is through developed in education's department. In order to grant national growth in education department, developing national education action which is appropriated with the research and technology growth, civilization, global chalenge, and national growth. To execute the main objective of national education, thus arranged a curriculum. In the journey, this curriculum get developed and appropiated with modern era by the time. **[1]**

Beside that, in the process to controll quality, curriculum is very essential instrument because become foundation to ensure the execute of competence that is hoped. Since year 1945 until this moment, national education curriculum has been changed, that is in year 1947, 1952, 1964, 1968, 1975, 1984, 1994, 2004, 2006, and 2013. **[2]**

Curriculum of 2013 was developed as education theory based on the standard. Education based on the standard fixed that there is national standard as minimum quality of citizen that is detailed become standard of content, standar proses, graduated competency standard, teachers standard, and educational personnel, facilities and infrastructure standard, management standard, finance standard, and standard of education assessment. Curriculum of 2013 have objective to prepare Indonesian's human in order to have living ability as personal and citizen based on faith, productive, creative, inovative, and affective also able to contribute in society, nation, state, and world civilization. **[3]**

To achieve that glorious purposes is necessary learning method and learning source that appropiated. One kind of learning method that can be used is think pair share type of cooperatif and learning souce that can be used is student worksheet.

Worksheet is pieces of papper that filled by task that must be done by student. Worksheet usually contain clue, step to finish a task, task that is assigned in student worksheet must clear in basic competence that will be achieved. **[4]** Based on the meaning, worksheet is student's work guidance to make student easier in execution learning activity. Hopefully by the existance of teaching materials like student worksheet can help student to easier in understanding lesson concept, get personal study experience, and learn to understand essay tasks so easier for teacher to run teaching and learning process.

In order to make student easier to think, remember, and understand matter that appear in a student worksheet, one of strategy that is offered by writer is usage of student worksheet that has developed **[5]**, entitled Bilingual Worksheet with Mind Mapping Strategy for Subject Atomic Structure and the Periodic Table for High School X class that has been validated. That student worksheet is very

suitable for researcher because have mind mapping strategy for subject atomic structure and the periodic table and completed with guidance in two language, Indonesian and English language. The other reason is researcher have opportunity to meet and take permition directly to use the worksheet that has been developed.

Mind Mapping have many functions, two of them are to summarize and review the lesson's matter. Mind Mapping using colours and pictures to building imagination and way to drawing picture. Mind Mapping with words or pictures that perch in parabolic lines or branches will help to associated memory. With mind mapping, train brain to work in remember will become easier, no matter how complex things that need to be remember because mind mapping is the king of memory. **[4]**

Generally student have difficulties when remember and understand matter on the thick study book. The time that student which is limited is not equal with study matter that student must remember and understand that made student feel lazy to study. Fact that happen many times is student's habbit of work hard late in night before examination to remember the matters that will be tested in the morning, but they forget what they try to remember when the examination is coming.

The result of questionnaire pre-research that has been done show that: 78,78% students like to study chemistry but 78,78% feel chemistry is difficult on atomic structure and periodic table matter and 63,63% of them feel difficult because that matter is confusing; 60,60% of students study by write down teacher's explaination; 48% of student confest their

study resource is not completed by mind mapping and 96,96% of students want that their study resource is completed by mind mapping; 96,96% is agree if the chemistry learning must have group discussion (cooperative); 87,87% of student never read english chemistry literature; 72,72% of students think that it is important to study english term of chemistry; 60,60% of students agree if the worksheet that will be used is completed with english explaination (bilingual).

Based on explaination before and the result of pre-research questionnaire thus will be done research entitled,"Implemention of Bilingual Worksheet with Mind Mapping Strategy for Subject Atomic Structure and the Periodic Table"

Based on the background that has been served above, so the objective of this research as follows:

1. To observe how the materialization of student bilingual worksheet implementation with mind mapping strategy by cooperative learning model on atomic structure and periodic table matter in teaching and learning activity.
2. To observe how the student's activity when student bilingual worksheet implementation with mind mapping strategy by cooperative learning model on atomic structure and periodic table matter in teaching and learning activity.
3. To observe how the student's learning outcomes after student bilingual worksheet implementation with mind mapping strategy by cooperative learning model on atomic structure and periodic table matter in teaching and learning activity.

4. To observe how the student's response after student bilingual worksheet implementation with mind mapping strategy by cooperative learning model on atomic structure and periodic table matter in teaching and learning activity.

METHOD

This research is using pre-experiment non-designs research method in form of one group pretest posttest design that is analyzed discriptively. This experiment is held on one group only without comparator group.

The objective in this research is implementation of student bilingual worksheet implementation with mind mapping strategy by cooperative learning model on atomic structure and periodic table matter that include materialization of syntax, student's activity, student's learning outcomes, and student's response on atomic structure and periodic table matter for SMA Negeri 1 Kertosono class X odd semester.

Learning Instrument

1. Sylabus

This instrument is used as guide and direction in arrange and perform learning activity in order to make the lesson as good as standard content that want to be achieved. Sylabus that is used in this research is chemistry sylabus of high school curriculum of 2013 that is used by chemistry teacher of SMAN 1 Kertosono kelas X semester gasal, which is sylabus from Badan Standar Nasional Pendidikan (BSNP) released by Depdiknas years 2013.

2. Lesson Plan

Lesson plan is created by teacher each interface that describe procedure and learning management to achieve one or more standard competence. This lesson plan is used as reference to execute teaching and learning process in class in order to run properly and efectively. **[5]**

3. Student Worksheet

Student worksheet that was used in this research is not developed by the researcher but using worksheet that has been developed and validated thus full fill the standard criteria of properness in order to be used as teacher's guide to teach. The student worksheet entitled,"Bilingual Worksheet with Mind Mapping Strategy for Subject Atomic Structure and the Periodic Table". **[5]**. The student worksheet contain learning objective, mater summarize, and questions that is given to students as exercise problem.

RESEARCH INSTRUMENT

1. Teacher's Activity Observation Sheet

This observation paper is used to assesst teacher's activity. From this observation paper can be known how the materialization syntax of cooperative learning model TPS type.

2. Student's Activity Observation Sheet

This observation paper is used to observing and scoring student learning activity. From this observation paper can be known how the student activity in class.

3. Learning Result Test Sheet

Test paper that is used in this research in pretest and postest form that contain multiple choice questions that represent indicator that the student must be achieved. Pretest is given in early meeting to get the student's initial score and posttest is given in the end of meeting to get the student's learning

result after implementation of bilingual worksheet with cooperative learning model.

4. Student's Responses Questionnare Sheet

Student responses questionnare paper contain question which is used to achieve information from students about their respon and commend after receive learning of implementation of bilingual worksheet with mind mapping strategy and used cooperative learning model.

DATA ANALYSIS

In this reseach, data that was achieved consist of quantitative and qualitative data. Data that is acieved will be collected and analyzed discriptively.

1. Analyze of Cooperative Learning Management Sheet

To analyze research's result that is given by observer due to cooperative learning management that was done by the teacher, data that is achieved then is analyzed by using Likert scale because one that measured is attitude and other's oppinion. Each answer was linked with form of statement that expressed by scale as follows:

Table 1. Likert Scale

Criteria	Scale
Very Good	5
Good	4
Moderate	3
Bad	2
Very Bad	1

[6]

The assessment is executed by two observers and the recalculated. To determine score each item from each observer using equations:

$$\% \, score = \frac{amount \; selected \; score}{amount \; maximum \; score} \times 100\%$$

[6]

The next step is determine the percentage means of score that has been got and analyzed using interpretation score criteria:

Table 2. Criteria Interpretation Score

No	Percentage (%)	Criteria
1	0-20	Very Deficient
2	21-40	Deficient
3	41-60	Enough
4	61-80	Good
5	81-100	Very Good

[6]

2. Analyze of Student Activity Sheet

Student Activity Sheet is analyzed using percentage which is:

$$\% \, activity = \frac{amount \; selected \; activity}{amount \; total \; activity} \times 100\%$$

[6]

Calculation and analysis is same with analysis of cooperative learning management. If the percentage of student activity $\geq 61\%$ its good.

3. Analysis of Student Learning Result Test

To know if an education is work or not is seen from the student's learning result. Student's learning result is seen from the increasing of pretest's and posstest's means result. Learning is success if posttest means is higher than pretest means.

To know the effectivity of treatment is used SPSS application using Paired-Samples T Test. If the significance result (Sig. 2-tailed) is lower than 0,05, so the treatment is

effective in increasing of student's learning result through posttest.

4. Analyze of Student's Response Questionnare

To know student's response due to cooperative learning activity, so data that was got is analyzed quantitative discriptively. Percentage calculation of respondents of the question in questionnare as followed:

$$\% \ student = \frac{amount \ student \ answer \ yes}{amount \ student \ that \ answer} \times 100\%$$

[6]

Table 3. Student's Respon Criteria Percentage

No	Persen	Kriteria
1	0% - 20%	Very Deficient
2	21% - 40%	Deficient
3	41% - 60%	Moderate
4	61% - 80%	Good
5	81% - 100%	Very Good

[6]

Student's respond is declared positive if the student give respond ≥ 61%, so considered all student agree or have positive response due to the statement.

RESULT

Data which is got in this research include observation of cooperative learning type think pair share materialization result data, teacher and student activity observation result data, and student learning result data as long as learning process is held, also data student response data that is got in the end of learning process.

1. **Materialization of cooperative learning model data**

This data is got from the result of observation result by two observers that give assessment based on observation

sheet that has provided. This assessment is held in two meeting with 3x45 minutes allocation time. Assessment way by two observers is using likert criteria with range 1-5 then be treated by equation that suitable with analysis of learning materialization observation. All of the calculation of the first and second meeting can be seen in the table as follows:

Table 4. Syntax Materialization of Coopreative Learning Model Observation Result in First Meeting

Activity	%
1. Teacher tell student that today will do discussion about atomic theory.	80
2. Teacher introduce himself, delivery learning objective, and assessment system.	90
3. Teacher motivated student by invite the student to look around class and gratitude, after that invite student to pray together.	100
4. Teacher share student worksheet to each of student.	90
5. Teacher give focus for discuss by discribe the basic rules.	80
6. Teacher give initial question that like one in worksheet.	100
7. Teacher ask student to the question in each student worksheet for 2 minute *(think)*.	90
8. Teacher ask student to do discussion 3 minutes (pair).	80
9. Teacher as student to share their opinions in front of the class (share).	90
10. Teacher look after the discussion process by observe interaction of student, teacher act as moderator and also the minutes.	90
11. Teacher end discussion by summarize all matter that already be discussed.	80

Activity	%
12. Teacher with student take conclutson from the result of class discussion.	80
13. Teacher do debriefing by command student to analyze discussion that already done.	80
14. Teacher end learning process by give student a task to study the next matter.	100

Table 5. Syntax Materialization of Coopreative Learning Model Observation Result in Second Meeting

Activity	%
1. Teacher tell student that today will do discussion about periodic table.	80
2. Teacher delivery learning objective and assessment system.	80
3. Teacher motivated student and give apersepsi about last matter which is atomic theory and recall student about the prize that will be give to the best 6 grup.	90
4. Teacher share student worksheet to each of student.	80
5. Teacher give focus for discuss by discribe the basic rules.	80
6. Teacher give initial question that like one in worksheet.	80
7. Teacher ask student to the question in each student worksheet for 2 minute *(think)*.	80
8. Teacher ask student to do discussion 3 minutes (pair).	90
9. Teacher as student to share their opinions in front of the class (share).	90
10. Teacher look after the discussion process by observe interaction of student, teacher act as moderator and also the minutes.	80
11. Teacher end discussion by summarize all matter that already be discussed.	80

Activity	%
12. Teacher with student take conclutson from the result of class discussion.	80
13. Teacher do debriefing by command student to analyze discussion that already done.	80
14. Teacher give group rankings based on total score and give the present corresponding to the rankings.	90
15. Teacher end the learning process by say good bye and instruct the student to keep the spirit on.	80

From the table 4 and table 5 that is got show that the means of syntax materialization of coopreative learning model observation result in the first meeting is 87,9% and the second meeting is 82,7%. Both of the score is very good based on interpretation score criteria kriteria in table 2. From the observation result shown that there is decrease of the teacher's activity mean score in the first meeting to the second meeting. This because teacher have difficulties to fit in appropriating time allocation due to cooperative learning model think-pair-share type's syntax implementation model, posttest and questionnaire activity in the second meeting.

2. **Student's Activity Data**

This data is seen from how dominant student's activity from the implementation of cooperative learning model think-pair-share type in X-IIS class in SMA Negeri 1 Kertosono as long as 3x45 minutes. Student's activity in first and second meeting is observed by two observers. One observer observed nine group with two group member each. The result of observation data as follows:

Table 6. Student's Acvity Observation Result in the First Meeting

Student's Activity	Amount of Activity		
	O_1	O_2	Mean (%)
1. Listen or pay attention to teacher.	12	12	8,8
2. Make mind mapping task individually (think)	22	22	16,2
3. Make mind mapping task in pairs (pair)	22	22	16,2
4. Present discussion result (share)	46	46	33,8
5. Propose question	2	2	1,5
6. Discover important concept in lesson.	14	14	10,3
7. Write important concept in lesson.	18	18	13,2
8. Do task questions.	0	0	0
9. Fill student response's questionnaire	0	0	0
10. Irrelevant behavior.	0	0	0

Table 7. Student's Acvity Observation Result in the Second Meeting

Student's Activity	Amount of Activity		
	O_1	O_2	Mean (%)
1. Listen or pay attention to teacher.	9	9	6,6
2. Make mind mapping task individually (think)	24	24	17,6
3. Make mind mapping task in pairs (pair)	30	30	22,1
4. Present discussion result (share)	36	36	26,5
5. Propose question	10	10	7,4
6. Discover important concept in lesson.	7	7	5,1
7. Write important concept in lesson.	7	7	5,1
8. Do task questions.	10	10	7,4
9. Fill student response's questionnaire	3	3	2,2
10. Irrelevant behavior.	0	0	0

From table 6 and table 7, activity Listen or pay attention to teacher is 8,8 % in first meeting decrease become 6,6% in the second meeting. This was happened because student was started adapt to the learning model that implemented, so they need smaller time to understand teacher's explaination. Student's activity to make mind mapping task individually and pairs in the first meeting 16,2% and 16,2% increase become 17,6% and 22,1% in the second meeting. Student' activity to Present discussion result (share) is 16,2% in the first meeting increase become 22,1% in the second meeting. Both of them happened because student start to comfort with cooperative learning model. Student's activity to propose question is 1,5% in the first meeting increase become 7,4% in the second meeting. This is happened because student get braver to asked after implementation in the first meeting that fun. Student's activity to Discover important concept in lesson is 10,3% in the first meeting decrease become 5,1% in the second meeting and student's activity to discover important concept in lesson is 13,2% in the first lesson decrease become 5,1% in the second meeting. Both of them happened because student find some important concept when asked question.

3. **Learning Result Data**

This data is got from pretest and posttest result after implementation of cooperative learning model think-pair-share type in X-IIS class of SMA Negeri 1 Kertosono. Student's learning result is measurement instrument to know student mastery level due to lesson study. Student learning result is used to do assessment about every student development that include knowledge by using pretest sheet to know the initial ability then used posttest sheet to know the ability of student after treatment.

Table 8. Student Learning Result in Atomic Structure and Periodic Table Matter Data

Group	Absent	Score Pre-test	Score Post-test	Note
1	1.	50	90	↑ 40 point
2	2.	70	100	↑ 30 point
3	3.	60	70	↑ 10 point
4	4.	70	100	↑ 30 point
5	5.	30	50	↑ 20 point
6	6.	50	80	↑ 30 point
2	7.	30	60	↑ 30 point
1	8.	70	80	↑ 10 point
7	9.	50	70	↑ 20 point
8	10.	40	80	↑ 40 point
9	11.	30	60	↑ 30 point
3	12.	60	90	↑ 30 point
10	13.	20	70	↑ 50 point
10	14.	40	70	↑ 30 point
11	15.	70	80	↑ 10 point
12	16.	60	70	↑ 10 point
13	17.	60	90	↑ 30 point
6	18.	70	100	↑ 30 point
15	19.	70	100	↑ 30 point
16	20	40	90	↑ 50 point
4	21.	30	80	↑ 50 point
14	22.	50	80	↑ 30 point
12	23.	60	90	↑ 30 point
17	24.	40	50	↑ 10 point
17	25.	30	60	↑ 30 point
16	26.	20	50	↑ 30 point
13	27.	40	60	↑ 20 point
7	28.	50	90	↑ 40 point
5	29.	60	90	↑ 30 point
18	30.	40	50	↑ 10 point
11	31.	30	70	↑ 40 point
14	32.	50	80	↑ 30 point
18	33.	50	90	↑ 40 point
9	34.	50	60	↑ 10 point
8	35.	40	70	↑ 30 point
15	36.	30	60	↑ 30 point

From table 8, individual learning result shown that in pretest there are 83,33 % or 30 from 36 students that got score ≤ 69 that consider incomplete with the highest score 70 and the lowest score 20. After implementation that was held to 36 siswa kelas X – IIS 3, there is reduction of incomplete student in posttest become 10 from 36 students or 27,77% with the highest score 100 and the lowest score 50.

In posttest there are still 10 students student that got incomplete score, but all of the student got increasing score. The increasing score as follows:

Table 9. The Increasing Score of Incomplete Students

Grup	Absent	Score Pre-test	Score Post-test	Note
5	5.	30	50	↑ 20 point
2	7.	30	60	↑ 30 point
9	11.	30	60	↑ 30 point
17	24.	40	50	↑ 10 point
17	25.	30	60	↑ 30 point
16	26.	20	50	↑ 30 point
13	27.	40	60	↑ 20 point
18	30.	40	50	↑ 10 point
9	34.	50	60	↑ 10 point
15	36.	30	60	↑ 30 point

From table 9, can be seen that every increase of score is really meaningfull to themself or their group even still incomplete score. As example in group 15, student with number 30 got increasing 30 score (developing score 30) from score 30 become 60, so the group developing mean in that student's group become 30 and get super team reward. To know how meaningful the increasing score for each student completely can be seen in this following table:

Table 10. Developing Score Mean and Group Reward

Group	Absen	Developing Score Mean	Reward
1	1 8	25	Great Team
2	2 7	30	Super Team
3	3 12	25	Great Team
4	4 21	30	Super Team
5	5 29	30	Super Team
6	6 18	30	Super Team

Group	Absen	Developing Score Mean	Reward
7	9 28	30	Super Team
8	10 35	30	Super Team
9	11 34	25	Great Team
10	13 14	30	Super Team
11	15 31	25	Super Team
12	16 23	25	Super Team
13	17 27	30	Super Team
14	22 32	30	Super Team
15	19 36	30	Super Team
16	20 26	30	Super Team
17	24 25	25	Great Team
18	30 33	25	Great Team

From table 10, can be known developing score and reward of each group in the last meeting. There is 11 super team reward and 7 great team reward. This is shown that individual score is really influence group developing score, and also the reversal. In explaination before about individual learning result, prove that when posttest is held the amount of incomplete student is decrease, and that happen either here. This is appropriated with Deutch theory **[7]** that identified three objective structure: cooperative, when goal-oriented-action of each individual give contribution on others competitive goal, when goal-oriented-action of each individual block other team member; and individualistic, when goal-oriented-action of each indivual does not have any consequence due to others team member.

Table 11. Paired Sample Statistics Data

		Mean	N
Pair 1	Pretest	47,50	36
	Posttest	75,56	36

Table 12. Paired Sample Test Data

		Sig. (2-tailed)
Pair 1	Pretest Posttest	,000

SPSS result in table 11 shown statistic descriptive student learning result that show pretest mean score is 47,50 and posttest mean score is 75,56. So student learning result after treatment by implementation student worksheet with mind mapping strategy and cooperative learning model think-pair-share type in atomic structure and periodic table is increase.

SPSS result in table 12 shown Paired-Samples T Test result between pretest and posttest, which is signification score (Sig.) = 0,000 or 0,0001. Because that signification socre (Sig.) is smaller than α = 0,05, thus H_0: $\mu A1 = \mu A2$ is rejected and H_1: $\mu A1 \neq \mu A2$ is accepted, with conclusion there is effectiveness on implementation student worksheet with mind mapping strategy and cooperative learning model think-pair-share type in atomic structure and periodic table due to student learning result.

4. **Student's Response Data**

In the end of meeting, questionnare was share to know student's response after implementation of cooperative learning model think-pair-share type in atomic structure and periodic table. Data that was achieved from the questionnaire as follows:

Table 13. Student Response's
Questionnaire Data

No	Question	Percentage choice (%)	
		yes	no
1	Is your teacher explain steps of teaching and learning?	100	0
2	Is TPS is student center?	91,67	8,33
3	Is with TPS study in class become more fun?	100	0
4	Is with TPS, you become easier to follows lesson?	97,22	2,78
5	Is TPS learning make you easier to do questions and tasks?	97,22	2,78
6	Is TPS learning can motivate you to study and achievement?	94,44	5,56
7	Is TPS learning can develop sense of mutual respect other people's opinions?	91,67	8,33
8	Is TPS learning can develop better relation and teamwork each friend?	91,67	8,33
9	Is bilingual student worksheet that was used make you know chemistry literature in English language?	97,22	2,78
10	Is student worksheet with mind mapping make you easier to understand quicker?	94,44	5,56

From the table 13, there are 100% of students answer "yes" in question that teacher explain steps of teaching and learning process. The percentage is conclude in very good category appropriate with student's respon percentage criteria.

There are 100% of students answer "yes" in question that by think-pair-share learning the study in class become fun. This means that all student in the class really loves learning with cooperatiove learning model specially think-pair-share type.

Beside that, there are 97,22% of students answer "yes" in question that when think-pair-share learning is held, student become easier to finish task and question. There are 94% of students answer "yes" too in question that student worksheet with mind mapping that is used make student easier to understand lesson quicker, which is evidenced by the increasing of student learning result from pretest means 48,88 increase become 78,61 in posttest.

There are 94,4% of student answer "yes" in question that think-pair-share learning can motivated student to study and achievement. This is appropriate with Skinner's opinions that the objective of psychology in education is to predict and controll behavior and consider "reward" or "reinforcement" as the main factor in the learning process.

Student's knowledge of chemistry literature in English language is increase too, this is reinforced by the percentage 97,22% of student answer "yes" in question that bilingual student worksheet that was used make student know chemistry literature in English language. This make student have wider knowledge about chemistry literature, not only in Indonesian language but also in English language.

CLOSING
Conclution

Based on result data of implementation of bilingual worksheet with cooperatif learning model type of think-pair-share due to atomic structure and periodic table research, can be concluded that:

1. Based on the observation of learning materialization, the score percentage of cooperative learning model materialization's observation result in the first meeting is 87,9% (very good) and the second meeting is 82,7% (very good).

2. Based on observation of student's activity result, relevant activity in the first meeting is 100% (very good) and the second meeting is 100% (very good).

3. Based on student's learning result, data showing increase of pretest to posttest which is from 47,50 become 75,56. Group that got appreciation as super team is 11 group and great team is 7 group. In pretest there is 83,33 % or 30 from 36 student not reach completeness and then decrease become 27,77% or 10 from 36 student in posttest. Calculation using efectivity by SPSS test of Paired-Samples T Test between pretest and posttest showing that there is efectiveness in student's learning result after implementation of bilingual worksheet with cooperatif learning model type of think-pair-share due to atomic structure and periodic table.

4. Based on student's questionnare response, the response of student X-IIS 3's class in SMA Negeri 1 Kertosono after implementation of bilingual worksheet with cooperatif learning model type of think-pair-share due to atomic structure and periodic table include very well category, with mean 95,55 student answer each question in student's questionnare response with positive response.

Suggestion

From the research that has been done and its result that has been get, suggestion

that can be proposed for the next research as followed:

1. Its better to reduce the amount of student that being observed by added the amount of observer, for a better observation of each student's activity.

2. For the mind mapping that student made is better to assesst appropiate to the rules of mind mapping assessment so the result will far much better.

3. Posttest is better if held in outside of lesson hour, because it can disturb student's activity.

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