
Effectiveness of Implementing the Lithium Application (Epub Reader) to Reduce Misconceptions on Chemical Equilibrium Material

Dian Rani Minggus^{1}, Afadil¹, Sitti Rahmawati¹, Vanny M.A. Tiwow¹*

¹⁾ Department of Chemistry Education, Universitas Tadulako, Indonesia

*E-mail Corresponding Author: dianraniminggus@gmail.com

Abstract

Effectiveness in learning is the achievement of a learning process appropriate and in line with the learning objectives that have been designed, where this success can be achieved because there is a reciprocal relationship between students and educators when learning takes place so that it is able to increase students' interest in participating of learning. The aim of this research is to test the effectiveness of applying the Lithium application to reduce students' misconceptions about Chemical Equilibrium material. The type of research used in this research is research and development (R&D). Research and development is a process carried out to produce a particular product and test the effectiveness of the resulting product. Based on the results of the pretest and posttest for experimental class 1 and experimental class 2, the average percentage results for reducing students' misconceptions in the Chemical Equilibrium material using the Lithium application were 18.3% and 19.4%, respectively. With the N-Gain score level for experimental classes 1 and 2 respectively 0.70 and 0.71 in the High category, while the interpretation of the effectiveness of the N-Gain score for each experimental class is 70.04% and 70, respectively 58% are in the Fairly Effective category.

Keywords: lithium applications, misconceptions, reduction

Abstrak

Efektivitas dalam pembelajaran adalah pencapaian proses pembelajaran yang sesuai dan selaras dengan tujuan pembelajaran yang telah dirancang, di mana keberhasilan ini dapat dicapai karena adanya hubungan timbal balik antara siswa dan pendidik ketika pembelajaran berlangsung sehingga mampu meningkatkan minat siswa dalam berpartisipasi dalam pembelajaran. Tujuan penelitian ini adalah untuk menguji efektivitas penerapan aplikasi Lithium untuk mengurangi miskonsepsi siswa tentang materi Keseimbangan Kimia. Jenis penelitian yang digunakan dalam penelitian ini adalah penelitian dan pengembangan (R&D). Penelitian dan pengembangan adalah proses yang dilakukan untuk menghasilkan produk tertentu dan menguji efektivitas produk yang dihasilkan. Berdasarkan hasil pretest dan posttest untuk kelas eksperimen 1 dan kelas eksperimen 2, persentase rata-rata hasil pengurangan miskonsepsi siswa pada materi Keseimbangan Kimia dengan menggunakan aplikasi Lithium masing-masing adalah 18,3% dan 19,4%. Dengan tingkat skor N-Gain untuk kelas eksperimen 1 dan 2 masing-masing sebesar 0,70 dan 0,71 dalam kategori Tinggi, sedangkan interpretasi efektivitas skor N-Gain untuk setiap kelas eksperimen masing-masing sebesar 70,04% dan 70,58% berada dalam kategori Cukup Efektif.

Keywords: aplikasi litium; miskonsepsi; reduksi

Introduction

Education plays a very vital role and becomes a key factor in living in society. Therefore, education is a basic need that must be met by every individual throughout life. Without education, a group of people will find it very difficult to grow and develop according to their hopes or goals, in achieving progress, prosperity, and happiness with their outlook on life. The curriculum is an educational plan designed to shape the younger generation so that they can play a role and become useful members of society after undergoing formal education at school. The curriculum functions as a guideline and basis for the learning process in an educational institution. At this time, educators are implementing the Independent Curriculum.

Education is transfer knowledge, values and skills from educator to participant educate. In UU No. 20 of 2003 Article 1 Paragraph 1 of National Education System state that "Education is business conscious and planned For realize atmosphere learning and the learning process for participants educate in a way active develop potency himself For own religious spiritual power, control self, personality, intelligence, morals noble, as well necessary skills_himself, society, nation and state". Along with developments over time, education No regardless from development knowledge knowledge and technology (IPTEK) (Rahdiyanta, et al, 2020). Utilization technology in the learning process moment This require teachers to more creative in increase knowledge, attitudes and skills student. Kuswanto & Radiansah (2018) in his research disclose that one_method for become a creative teacher is with utilize learning media.

Instructional Media is part from source Study, combination between device soft (material learning) and devices hard (tool learning). With using learning media, abstract teaching materials can concreted (Andriani et al., (2023). With the existence of learning media then the learning process teach become more interesting (Haq & Sukarmin, 2023).

Learning will the more interesting with utilize appropriate and compatible electronic media_with demands development technology and information is one of them with utilise application software assisted. One of the software that can support learning moment Now This is ePUB reader that works for reading eBooks. One of ePUB reader that can utilized for open, read and manage digital books are application Lithium. With exists application This expected capable increase skills and abilities student as well as minimize or reduce misconceptions that often occur in learning equilibrium chemistry especially on concept equilibrium homogeneous and equilibrium heterogeneous (Parniyanda & Sukarmin, 2022). Reduction misconception in matter This is descent or subtraction level error concepts experienced by participants educate (Wafiyah et al., 2025).

Masyitha (2021) has do study about relevance and consistency application Lithium For reduce misconception high school students on the material Chemical Equilibrium and conclusion that data on the feasibility of learning media are in the category good and valid according to media expert with average value 3.15. For results validity from expert material chemistry obtained a mean value of 3.00 was located in category good and valid, as well validity based media experts facet appearance physical and functional application Lithium obtained mean value 3.65 in category appropriate and valid, so that the application media This can used as a learning medium specifically in reduce misconception high school student. Based on results study Masyitha (2021) about application Lithium is good and valid, researchers mean for test its effectiveness in reduce misconception student on chemical equilibrium material .

Method

Type Research used in study this is research and development or Research and Development (R&D). Research and development is a process that is carried out For produce something product certain as well as test effectiveness from the products

produced (Sugiyono, 2013). Products produced form application used for read epub files material Chemical equilibrium. Design research used in study This is One Group Pretest Posttest Design. Design study type This that is design existing research One group experiment Then given pretest for

determine preconception (concept beginning) students in class next experiment given treatment, in matter This learning use application Lithium and finally given posttest. Implementation design study can seen in Table 1.

Table 1.

Research Design One Group Pretest Posttest Design

Group	Pretest	Treatment	Posttest
A	0 1	X	0 2
B	0 1	X	0 2

Population is whole object study. Population in study This is all over student class XI MIPA at SMA Negeri 4 North Toraja 2021/2022 teachings which have been learn material Chemical equilibrium. Sample study taken from population with use technique purposive sampling (selection spread considerations) are made with method take a subject that doesn't based on over strata or area but based on objective with consideration certain.

Samples taken is student class XI MIPA 2 and XI MIPA 4 with amount student class XI MIPA 2 is 20 students with type sex men 12 people and types sex women 8

people and total student class XII MIPA 4 is 22 students with type sex men 7 people and types sex 15 women.

Deep data collection techniques study This is with use test tracker conception student about material Chemical Equilibrium is shaped question choice accompanied double with Certainty of Response Index (CRI) provided to student for determine difference students who know concept (TK), no know concept (TTK), and Misconceptions (MK) on the results test. For can differentiate between students who know concept, no know concepts and misconceptions, can used provisions used by Hasan et. al. (1999).

Table 2.

Grouping Criteria Answer Student Based on CRI

Answer Criteria	Low CRI (<2,5)	High CRI (>2,5)
Correct answer	Don't know the concept (Lucky guess)	Master the concept well
Wrong answer	Don't know the concept	Possibility happen misconception

For know is student in answer every the question given That use concepts/knowledge possessed or only

guess just so for that each question item student requested For fill in CRI scale with provision as following Table 3.

Table 3.

Index Confidence Answer Student in Answer Question

CRI	Criteria
0	Totally guessed answer
1	Almost guess
2	No sure
3	Sure
4	Almost certain
5	Certain

For set which concept is best understood in a way misconceptions by

groups respondents can done with method identify misconception in a way group.

Identification misconception in a way group is based on the average of the obtained CRI index from respondents who answered true (CRIB) and the average CRI index of respondents who answered incorrectly (CRIS) as well fraction respondents who answered true (Fb). CRIB, CRIS, and Fb values can be calculated with use formula:

$$\text{CRIB} = \frac{\text{Total number of CRIs from correct answers}}{\text{The number of students who answered correctly}}$$

$$\text{CRIS} = \frac{\text{The total number of CRIs from incorrect answers}}{\text{Number of students who answered incorrectly}}$$

Table 4.

N-Gain Level Categories (Hake, 1999)

Limitation	Category
$g \geq 0.70$	Tall
$0.30 \leq g < 0.70$	Currently
$g < 0.30$	Low

Meanwhile, for distribution category deep N-gain gain form percent (%) can seen in Table 5 (Hake., 1999).

Table 5.

Category Interpretation N-Gain Effectiveness

Percentage (%)	Interpretation
<40	No Effective
40-55	Not enough Effective
56-75	Enough Effective
>76	Effective

Result and Discussion

This research was conducted to determine the effectiveness of implementing the *Lithium* application (ePUB Reader) in reducing students' misconceptions at SMAN 4 North Toraja regarding Chemical Equilibrium material. The implementation of This research began with the stage of preparing the instruments that would be used first. The learning instruments include a Learning Tool Plan (RPP), student response questionnaire sheets, Student Worksheets (LKPD) and misconception tracking tests (questions choice double). The lesson plan was designed with 3 meetings with a time allocation for each meeting of 2JPx45 minutes and 2 meetings for administering

$$\text{True faction} = \frac{\text{The number of students who answered correctly}}{\text{Total number of students}}$$

Descriptive data analysis or often called N-gain is used for describe achievement each variable with determine connection mark pretest and posttest student.

$$g = \frac{\text{posttest value} - \text{pretest value}}{\text{maximum value} - \text{pretest value}}$$

Information:

Posttest Value = Average score test end

Pretest Score = Average score test beginning

Maximum value = average score maximum

the pretest and posttest for each experimental class.

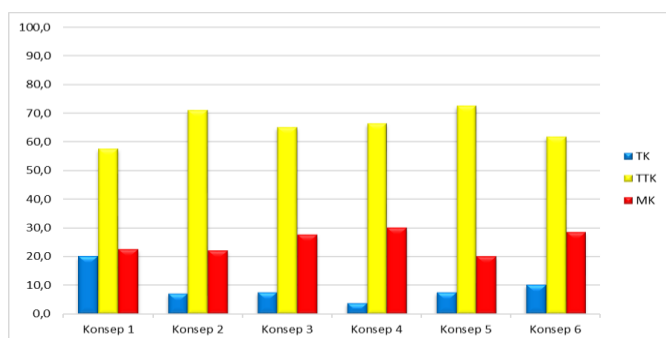
Learning is carried out by applying the *Lithium application* which contains Chemical Equilibrium material. Before carrying out learning activities, the two experimental classes were first given an initial test (*pretest*) in the form of multiple choice questions accompanied by a CRI totaling 20 questions. Before use, the student conception tracking test is first validated by an expert validator as a content validator. The *pretest* is given to obtain initial data about students' conceptions. After being given a *pretest*, the next stage is to carry out the learning process in each experimental class using the *Lithium application* which

started with introduce what that application *Lithium* as well as teach how operate application the. As for step use application *Lithium* is as following : 1) download Lithium app in Play Store; 2) after downloaded direct click the drive link that has been sent ; and 3) after the e- module open click on the button point three Then Select the settings menu and select Accessibility in the Ration Lock

section arrange appearance Landscape to make things easier in read the e-module. After going through 3 meetings, then gave a *posttest* to obtain percentage data on reducing student misconceptions. Based on the results obtained from the *pretest* of experimental class 1, the results in Figure 1 were obtained.

Figure 1.

Comparison Percentage Class XI MIPA 2 Students Who Know Concept (TK), No Know Concepts (TTK), and Misconceptions (MK) in Implementation Pretest for Material Chemical equilibrium



Based on the data in Figure 1 can explained that, from sixth the concept being tested cause all student experience misconceptions. The most concept responded student in a way misconception is draft fourth that is Le Chatelier's Principles. Existing graphics show misconceptions experienced by each draft is at above 20% of amount whole student class XI MIPA 2, meanwhile part big student including in TTK category above 50% in each draft. This matter in line with research that has been conducted by Silviana & Ritonga (2025) where in his research percentage misconception student amounting to 17% on concept direction shift equilibrium chemistry with use Azaz Lee Chatalier .

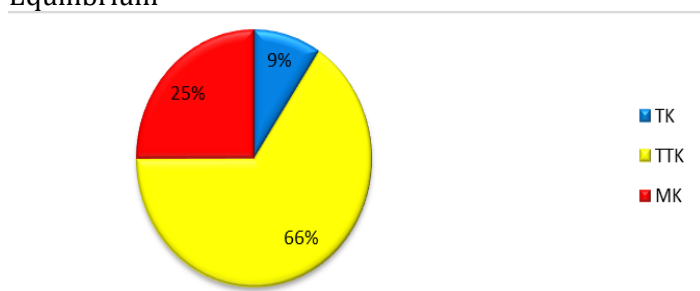
Misconceptions experienced by students caused by because in determine direction shift equilibrium student Still confused with direction shift on each factor especially on factors influenced by concentration (Novita et al., 2025). Many students believe it that with exists addition concentration from something substance so

concentration from will make concentration from substance the will the more big. Another thing that triggers it misconception student is student No notice with Good the phase being taken into account in every influencing factor shift equilibrium chemistry. By general average percentage conception student in respond material Chemical Equilibrium can seen in Figure 2.

Based on Figure 2 you can is known that average value of percentage conception for student Know Concept (TK), No Know Concepts (TTK) and Misconceptions (MK) respectively 9%, 66% and 25%. Data obtained show that most student are in the category No Know Concept (TTK). This caused by because in determine direction shift equilibrium chemistry, students no notice phases used in each factor as well as not enough carefully student in understand every influencing factor equilibrium, where? direction shift equilibrium when influenced by concentration, pressure, volume, temperature nor catalyst (Haetami, et al., 2022).

Figure 2.

Comparison Diagram Percentage Class XI MIPA 2 Students Who Know Concept (TK), No Know Concepts (TTK), and Misconceptions (MK) in Implementation Pretest for Material Chemical Equilibrium



For set alleged concept experience strongest misconception from sixth the concept being tested to student so used identification misconceptions. Identification based on CRIB, CRIS, and Fb data for each item representative test concepts in material Chemical equilibrium. Calculated CRIB, CRIS, and Fb data from results *pretest* class Experiment 1 is presented in Figure 3.

By detailed about conception students in each question shown in the image below on Figure 4. Based on Figure 3 and Figure 4

response student of the 6 concepts tested experience misconceptions that impact it classified very strong. Because it is earned results analysis on all draft own CRIS value < 2.5 and $Fb < 0.5$. According to Hasan, et al. (1999) when the values $2.5 < CRIS \leq 0.5$ and $Fb < 0.5$ are understood by students in a way misconceptions and degrees or impact misconception stated strong If the CRIS value is large and the Fb value is small.

Figure 3

Chart Comparison of CRIB, CRIS, Fb for Class XI MIPA 2 Students in Implementation Pretest for Material Chemical equilibrium

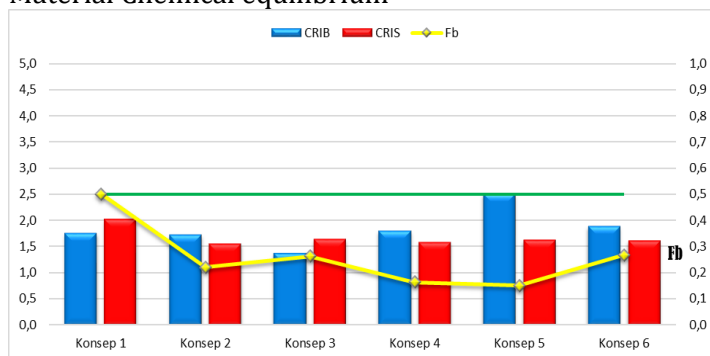
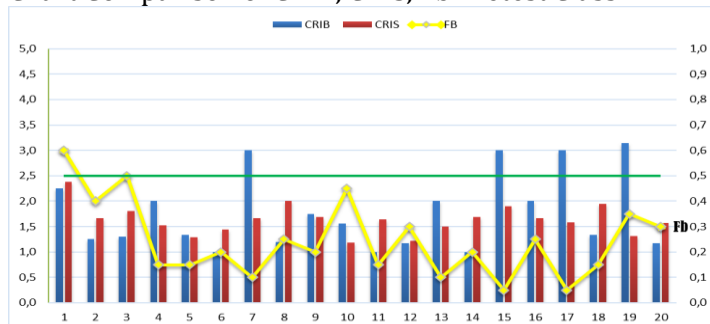
**Figure 4.**

Chart Comparison of CRIB, CRIS, Fb Pretest Class XI MIPA 2 Students in Each Question

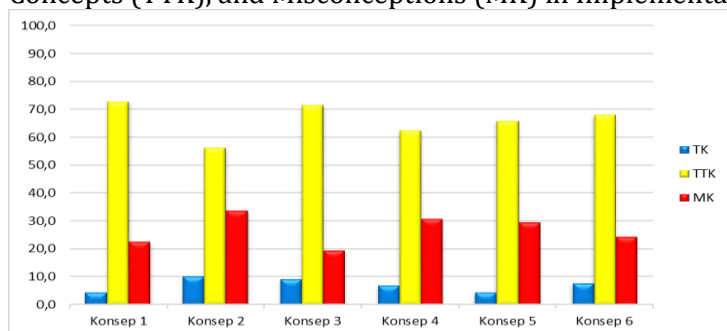


Pretest results obtained from class experiment 2, obtained results in Figure 5. Based on the data in Figure 5 can be explained that, from sixth the concept being tested cause all student experience misconceptions. The most concept responded student in a way misconception is draft second that is Constant Equilibrium (K_c). Existing graphics

show misconceptions experienced by each draft is at above 20% of amount whole student class XI MIPA 4. This in line with research that has been conducted by Akbar, 2017 Where in his research level misconceptions experienced by students on the concept Constant The equilibrium K_c reaches 43.785%.

Figure 5.

Chart Comparison Percentage Class XI MIPA 4 Students Who Know Concept (TK), No Know Concepts (TTK), and Misconceptions (MK) in Implementation Pretest

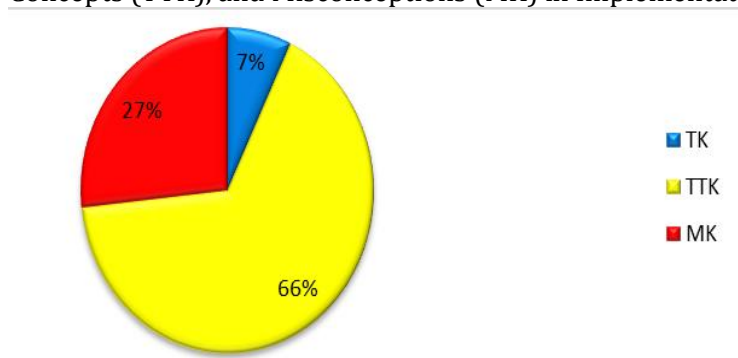


Misconceptions experienced by students regarding the concept this triggered by because in state concentrate on the student's K_c formula no convert moreover first mol to molarity. Another thing that causes it misconception is student No notice the phase being taken into account Because in determine constant K_c equilibrium is

simply substances that have phase only aq (aq) and gas (g) are used. Other issues are considered difficult for students is count table first, reaction nor circumstances balanced. By general average percentage conception student in respond material Chemical Equilibrium can seen in Figure 6.

Figure 6.

Comparison Diagram Percentage Class XI MIPA 4 Students Who Know Concept (TK), No Know Concepts (TTK), and Misconceptions (MK) in Implementation Pretest



Based on Figures 5 and Figure 6 you can see that average value of percentage conception for student know Concept (TK), no Know Concepts (TTK) and Misconceptions (MK) respectively 7%, 66% and 27%. Can be seen that part big student are

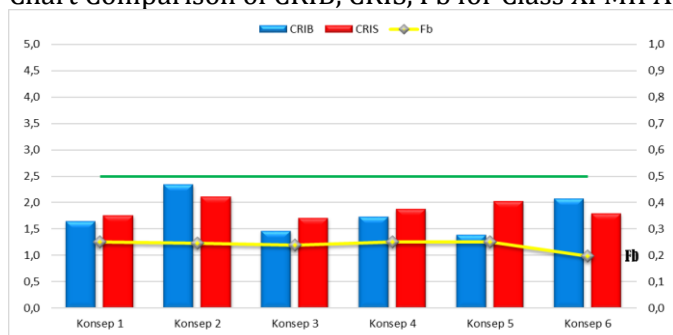
in the category no Know Concept (TTK), this caused by because student not enough understand existing concepts in material Chemical Equilibrium especially in determination constant equilibrium K_c , where in determine concentration units used

should in molar units but most student No convert from mole to molar. Another thing that causes it student experience misconception is part student consider that Kc is results multiplication concentration substance reactor shared with concentration substance results reaction with each promoted the coefficient where matter this in line with research that has been conducted by Ulinnaja et al., (2022).

For set alleged concept experience strongest misconception from sixth the concept being tested to student so used identification misconceptions. Identification based on CRIB, CRIS, and Fb data for each item representative test concepts in material Chemical equilibrium. Calculated CRIB, CRIS, and Fb data from results *pretest* class Experiment 2 is presented in Figure 7.

Figure 7.

Chart Comparison of CRIB, CRIS, Fb for Class XI MIPA 4 Students in Implementation Pretest

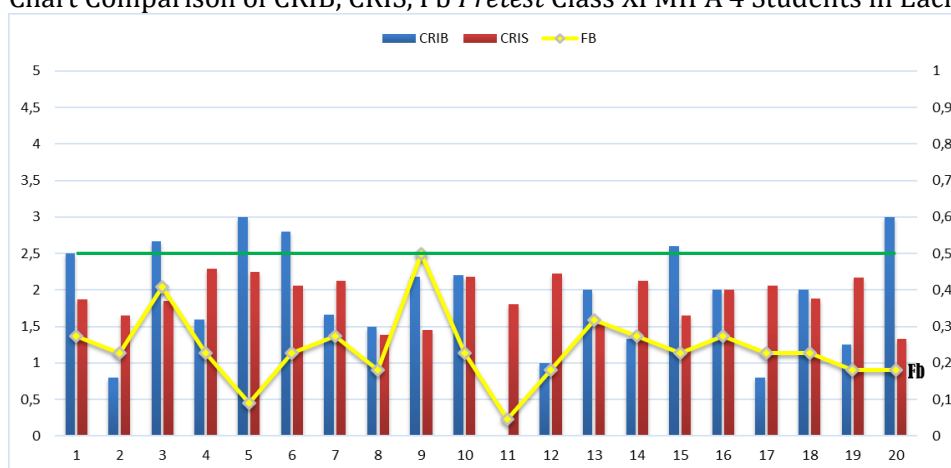


Based on Figure 7 shows CRIS and Fb values in each the concept being tested there is students who experience misconceptions. Response misconception student of the 6 concepts tested impact classified very strong. According to Hasan, et al. (1999) when CRIS values > 2.5 and $Fb < 0.5$ are understood by

students in a way misconceptions and degrees or impact misconception stated strong If the CRIS value is large and the Fb value is small. By detailed about conception students in each item question shown in the image below in Figure 8:

Figure 8.

Chart Comparison of CRIB, CRIS, Fb *Pretest* Class XI MIPA 4 Students in Each Question



The picture above show on each question student experience misconceptions. Misconceptions experienced classified strong based on draft from Hasan, et al. (1999)

which states if the values $2.5 < CRIS \leq 0.5$ and $Fb < 0.5$ are understood by students impact misconception stated strong If the CRIS value is large and the Fb value is small.

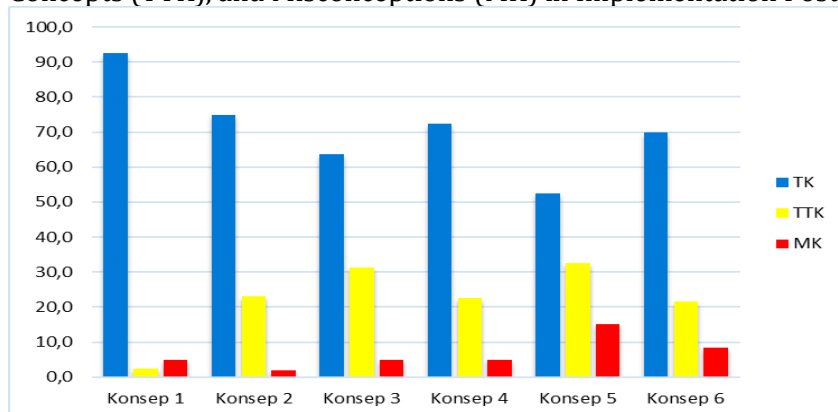
Pretest results class XI MIPA 2 and XI MIPA 4 show student Lots experience misconceptions about everyone concept in material Chemical equilibrium. Every student experience misconceptions about everyone different concepts Because understanding and power catch every student that different (Rahmawati et al., 2022).

After carrying out the learning process with use application *Lithium*, at the end learning student given test results learning

(*posttest*). Tests used form question choice double totaling 20 numbers question that has been declared valid by validator experts. Giving *posttest* aim for know the extent of the difference conception and reduction student before and after implementation learning use application *Lithium* in the material Chemical equilibrium. Based on the results obtained from the experimental class 1 *posttest*, the results in Figure 9 were obtained.

Figure 9.

Chart Comparison Percentage Class XI MIPA 2 Students Who Know Concept (TK), No Know Concepts (TTK), and Misconceptions (MK) in Implementation *Posttest*

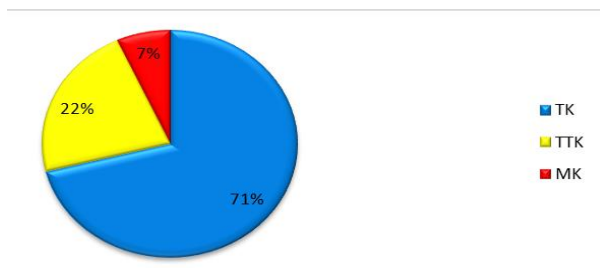


Based on the data in Figure 9 can explained that, from sixth the concept being tested Still cause student experience misconceptions. The most concept responded student in a way misconception is draft fifth that is Equilibrium Thermodynamics. Existing graphics show misconceptions experienced by each draft is at below 10% of amount whole student class XI MIPA 2 except for concepts fifth is at 15%.

Misconceptions experienced by students in draft This influenced by less understand student in equalize reaction with deep reaction circumstances balanced as well as moment reaction reversed, divided nor the coefficient experience addition or subtraction student very difficult For understand method it works. By general average percentage conception student in respond material Chemical Equilibrium can seen in Figure 10.

Figure 10.

Comparison Diagrams Percentage Class XI MIPA 2 Students Who Know Concept (TK), No Know Concepts (TTK), and Misconceptions (MK) in Implementation *Posttest*



Based on Figures 9 and 10 you can know that average value of percentage conception For student Know Concept (TK), No Know Concepts (TTK) and Misconceptions (MK) respectively 71%, 22% and 7%. Data obtained show that most student are in the category Know Concept (TK). This matter show that in giving material to student with use application *Lithium*, capable for increase ability student in understand every existing concept. As for misconception as well as no know concepts experienced by students in matter This

Because every student own Power catch different ones.

For set alleged concept experience strongest misconception from sixth the concept being tested to student so used identification misconceptions. Identification based on CRIB, CRIS, and Fb data for each item representative test concepts in material Chemical equilibrium. Calculated CRIB, CRIS, and Fb data from results *posttest* class Experiment 1 is presented in Figure 11 and Figure 12.

Figure 11.

Chart Comparison of CRIB, CRIS, Fb for Class XI MIPA 2 Students in Implementation Posttest

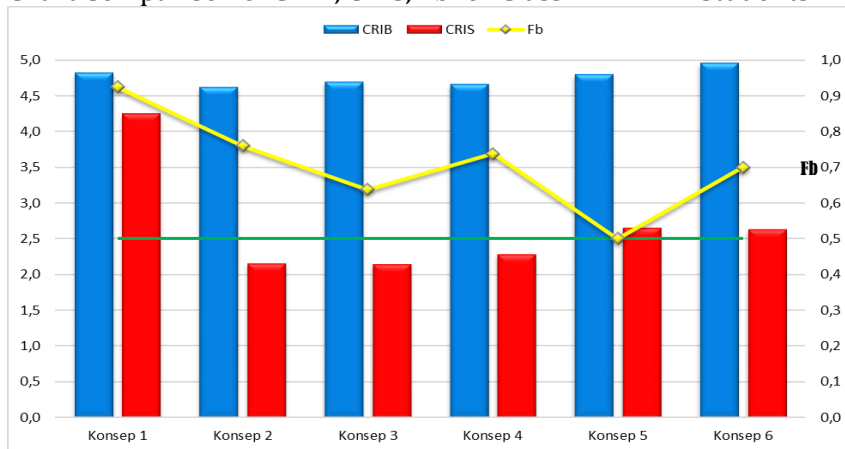
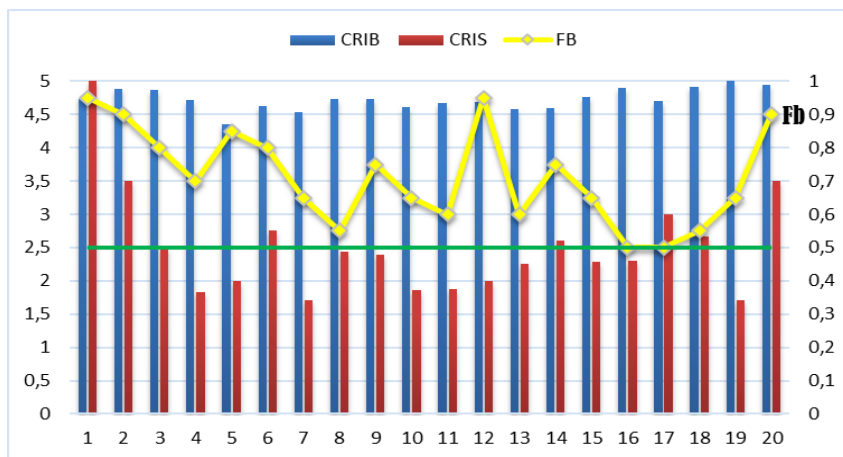


Figure 12.

Chart Comparison of CRIB, CRIS, Fb Posttest Class XI MIPA 2 Students in Each Question

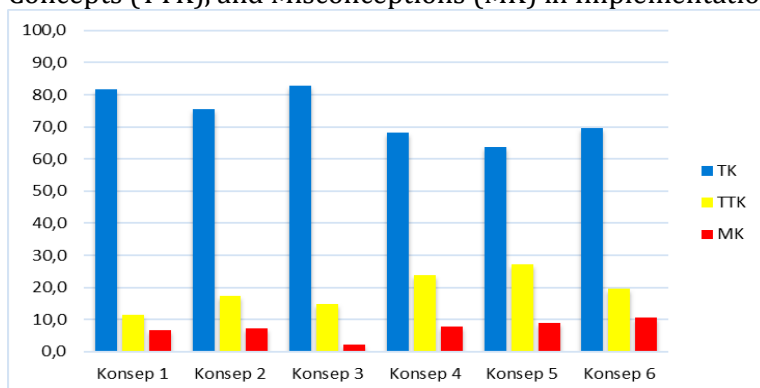


Based on Figure 11 and Figure 12 it shows CRIS and Fb values in each the concept being tested there is students who experience misconceptions. Response misconception student of the 6 concepts tested impact classified weak or no impact very strong. According to Hasan, et al. (1999)

when CRIS values > 2.5 and Fb < 0.5 are understood by students in a way misconceptions and degrees or impact misconception stated strong If the CRIS value is large and the Fb value is small. *Posttest* results obtained from class experiment 2, obtained results in Figure 13.

Figure 13.

Chart Comparison Percentage Class XI MIPA 4 Students Who Know Concept (TK), No Know Concepts (TTK), and Misconceptions (MK) in Implementation Posttest

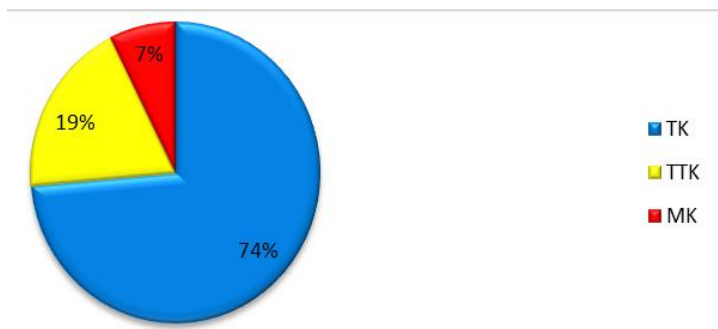


Based on the data in Figure 13 can explained that, from sixth the concept being tested Still cause student experience misconceptions. The most concept responded student in a way misconception is draft sixth that is Degrees Dissociation. Existing graphics show misconceptions experienced by each draft is at below 10% of amount whole student class XI MIPA 4 except for concepts sixth was at 10.6%. This

matter in line with research that has been conducted by Agustin, et al. (2022). Misconceptions experienced by students triggered by less understand student in determine table reaction, at first nor moment in circumstances balanced. By general average percentage conception student in respond material Chemical Equilibrium can seen in Figure 14.

Figure 14

Comparison Diagrams Percentage Class XI MIPA 4 Students Who Know Concept (TK), No Know Concepts (TTK), and Misconceptions (MK) in Implementation Posttest



Based on Figures 13 and Figure 14 you can know that average value of percentage conception For student Know Concept (TK), No Know Concepts (TTK) and Misconceptions (MK) respectively 74%, 19% and 7%. Data obtained show that most student are in the category Know Concept (TK) this caused by because in reception material student enthusiastic in use application so I feel like it you know high, as for misconceptions experienced because of

acceptance or Power catch student That different.

For set alleged concept experience strongest misconception from sixth the concept being tested to student so used identification misconceptions. Identification based on CRIB, CRIS, and Fb data for each item representative test concepts in material Chemical equilibrium. Calculated CRIB, CRIS, and Fb data from results *posttest* class Experiment 2 is presented in Figure 15 and Figure 16.

Figure 15.

Chart Comparison of CRIB, CRIS, Fb for Class XI MIPA 4 Students in Implementation *Posttest*

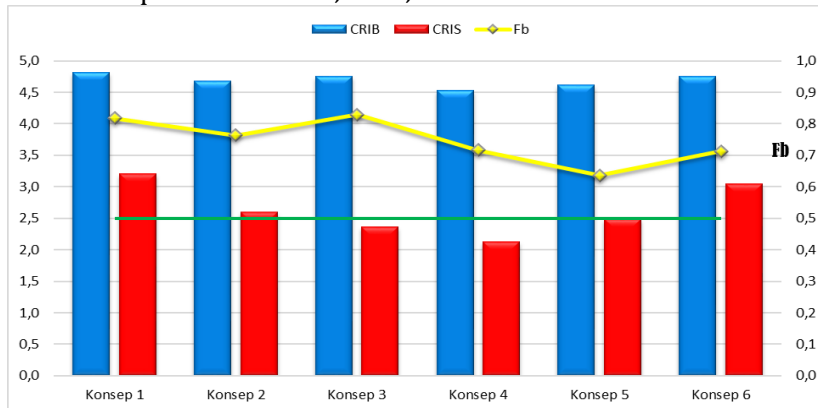
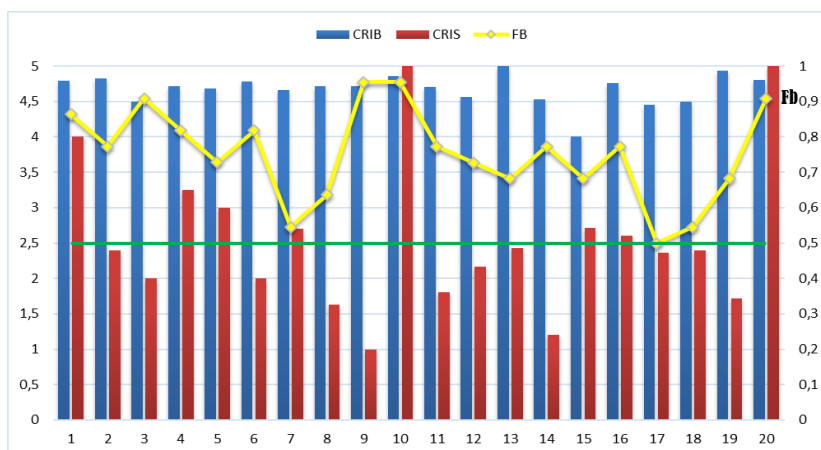


Figure 16.

Chart Comparison of CRIB, CRIS, Fb Posttest Class XI MIPA 4 Students in Each Question



Based on Figure 15 and Figure 16 it shows CRIS and Fb values in each the concept being tested there is students who experience misconceptions. Response misconception student of the 6 concepts tested impact classified weak or No impact strong. According to Hasan, et al. (1999) when CRIS values > 2.5 and Fb < 0.5 are understood by students in a way misconceptions and degrees or impact misconception stated strong If the CRIS value is large and the Fb value is small.

By overall, based on the data obtained then the average percentage reduction misconception student class XI MIPA 2 and XI MIPA 4 at SMAN 4 North Toraja use application *Lithium* in the material Chemical Equilibrium is presented in Table 6 and Table 7.

Based on results *pretest* and *posttest* class experiment 1 and class experiment 2, obtained results average percentage reduction misconception students on the material Chemical Equilibrium uses application *Lithium* in a way consecutive are 18.3% and 19.4%. In matter This percentage reduction misconception students in class XI MIPA 2 from 25.1% reduced to 6.7% meanwhile class XI MIPA 4 from 26.7% reduced to 7.3%. Reduction results class XI MIPA 4 more big compared to with results reduction class XI MIPA 2, p This affected by the lack of interest Study students during the learning process ongoing and deep do every question, level ability every student different.

Table 6.

Average Percentage Reduction Misconceptions Students in Class XI MIPA 2 *Pretest* and *Posttest*

No	Draft	MK (%)			Kindergarten (%)			TTK (%)		
		Pre	Post	Ed	Pre	Post	Ed	Pre	Post	Ed
1.	Law of Equilibrium	22.5	5.0	17.5	20.0	92.5	72.5	57.5	2.5	55.0
2.	Constant Equilibrium (Kc)	22.0	2.0	20.0	7.0	75.0	68.0	71.0	23.0	48.0
3.	Constant Equilibrium (Kp)	27.5	5.0	22.5	7.5	63.8	56.3	65.0	31.3	33.8
4.	Le Chatelier's Principle	30.0	5.0	25.0	3.8	72.5	68.8	66.3	22.5	43.8
5.	Equilibrium Thermodynamics	20.0	15.0	4.0	7.5	52.5	45.0	72.5	32.5	40.0
6.	Degrees of Dissociation	28.3	8.3	20.0	10.0	70.0	60.0	61.7	21.7	40.0
Average		25.1	6.7	18.3	9.3	71.0	61.8	65.7	22.2	43.4

Table above show exists decline level misconception very student significant and possible increase ability student in understand every draft. This matter can seen from exists surge Know Concept (TK) of very student tall where in class experiment 1

experienced increase Know Concept (TK) was 61.8% while in class experiment 2 experienced increase Know Concept (TK) was 66.5%. This matter show that application *Lithium* capable and effective for reduce misconception students on the

material Chemical equilibrium. Overall from the data obtained, achievements each variable in determine connection mark

pretest and posttest student use Application *Lithium* is obtained N-Gain value with The results are presented in Table 8.

Table 7.

Average Percentage Reduction Misconceptions Students in Class XI MIPA 4 *Pretest* and *Posttest*

No	Draft	MK (%)			Kindergarten (%)			TTK (%)		
		Pre	Post	Ed	Pre	Post	Ed	Pre	Post	Ed
1.	Law of Equilibrium	22.7	6.8	15.9	4.5	81.8	77.3	72.7	11.4	61.4
2.	Constant Equilibrium (Kc)	33.6	7.3	26.4	10.0	75.5	65.5	56.4	17.3	39.1
3.	Constant Equilibrium (Kp)	19.3	2.3	17.0	9.1	83.0	73.9	71.6	14.8	56.8
4.	Le Chatelier's Principle	30.7	8.0	22.7	6.8	68.2	61.4	62.5	23.9	38.6
5.	Equilibrium Thermodynamics	29.5	9.1	20.5	4.5	63.6	59.1	65.9	27.3	38.6
6.	Degrees of Dissociation	24.2	10.6	13.6	7.6	69.7	62.1	68.2	19.7	48.5
Average		26.7	7.43	19.4	7.1	73.6	66.5	66.2	19.0	47.2

Table 8.

Level Categories and Interpretation N-Gain Effectiveness

Class	N-Gain Score	N-Gain Score Percent
XI MIPA 2	0.70	70.04%
XI MIPA 4	0.71	70.58%

Based on table above show that N-gain score level of use application *Lithium* on class experiment 1 and class 2 consecutive experiments are 0.70 and 0.71 with "High" category, meanwhile interpretation effectiveness of each N-Gain score class experiments 1 and 2 respectively namely 70.04% and 70.58% are in the "Enough" category Effective ".

Learning carried out with apply Application *Lithium* can increase motivation student in Study as well as can increase memory student will teaching material taught because in application *Lithium* besides displayed material can also be done included with learning videos as well as related learning links so that capable support learning and power absorb student.

Conclusion

Based on the problem formulation to determine the level of effectiveness of implementing the Lithium application in reducing student misconceptions regarding Chemical Equilibrium material, the following conclusions can be drawn he average percentage of reduction in students' misconceptions using the Lithium Application in Chemical Equilibrium material

for Classes XI MIPA 2 and respectively are 61.8% and 66.5% which shows that the Lithium application is capable and effective in reducing student misconceptions. The level of N-Gain score for classes XI MIPA 2 and 04% and 70.58% are in the "Fairly Effective" category.

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