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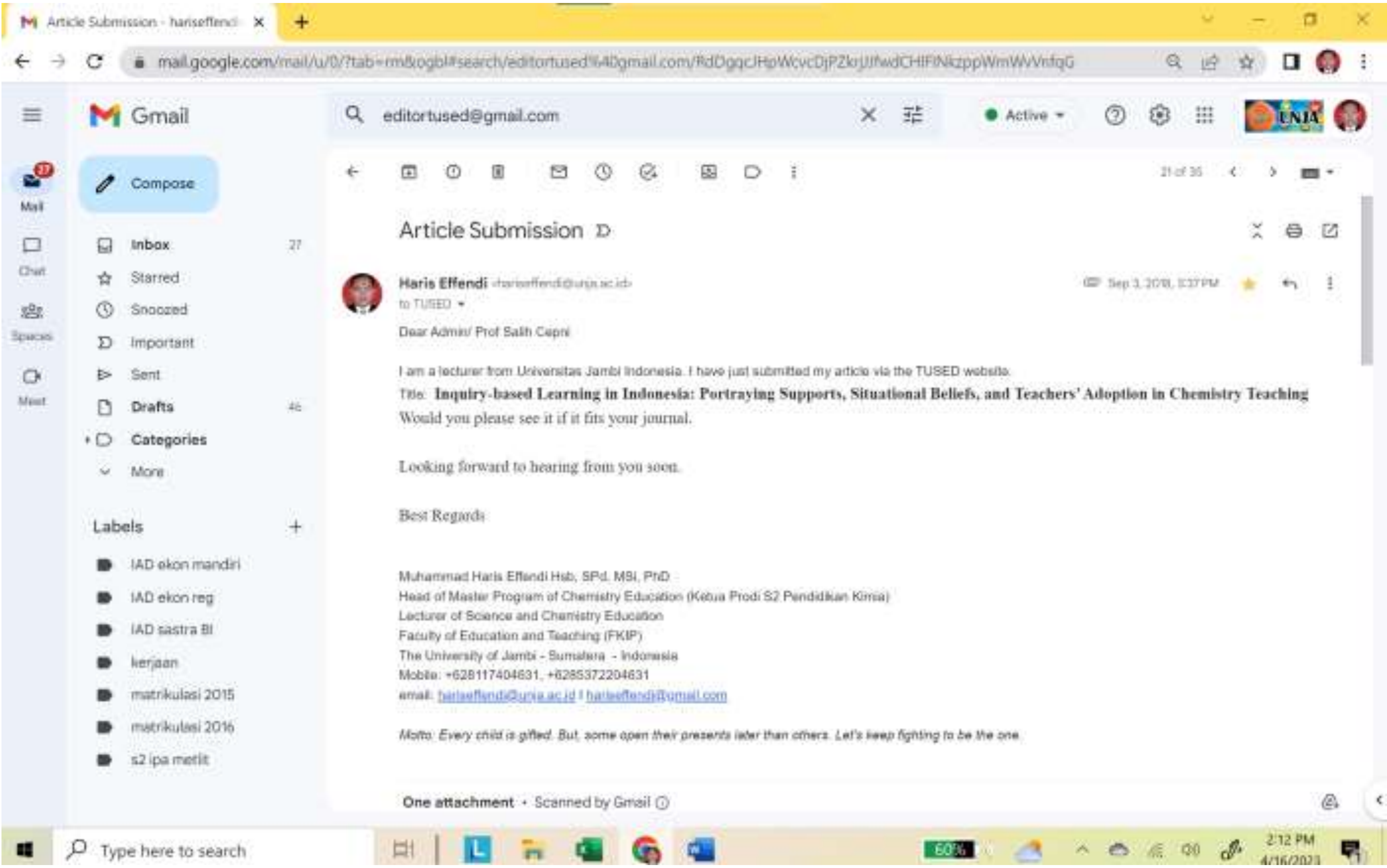
Article Submission

Haris Effendi <harisseffendi@unja.ac.id>
to TUSED

Dear Admin/ Prof Salih Cepni

I am a lecturer from Universitas Jambi Indonesia. I have just submitted my article via the TUSED website.

Title: **Inquiry-based Learning in Indonesia: Portraying Supports, Situational Beliefs, and Teachers' Adoption in Chemistry Teaching**

Would you please see it if it fits your journal.

Looking forward to hearing from you soon.

Best Regards

Muhammad Haris Effendi Hsb, SPd, MSi, PhD
Head of Master Program of Chemistry Education (Ketua Prodi S2 Pendidikan Kimia)
Lecturer of Science and Chemistry Education
Faculty of Education and Teaching (FKIP)
The University of Jambi - Sumatera - Indonesia
Mobile: +628117404631, +6285372204631
email: harisseffendi@unja.ac.id | harisseffendi@gmail.com

Motto: Every child is gifted. But, some open their presents later than others. Let's keep fighting to be the one.

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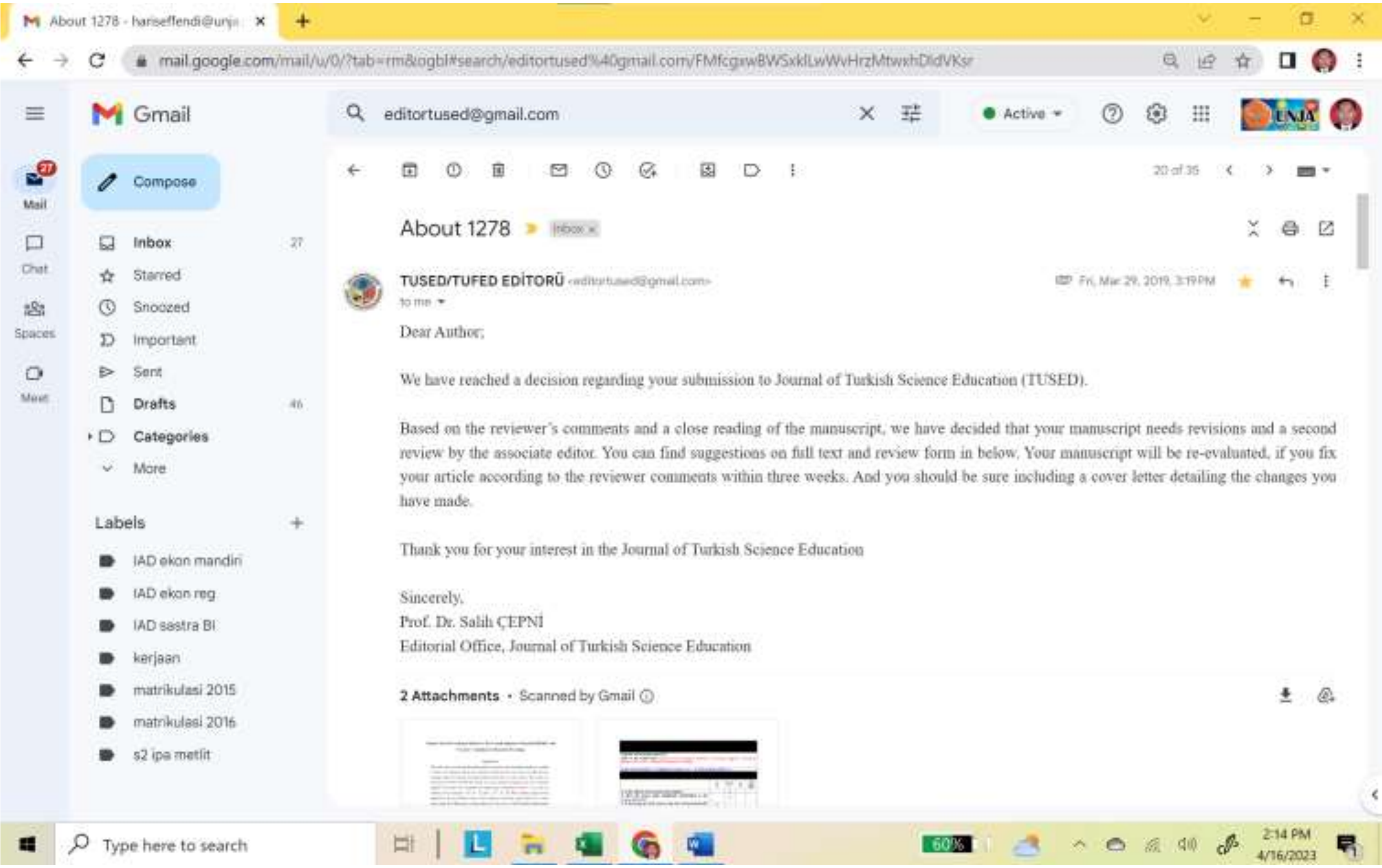
About 1278

TUSED/TUFED EDİTORÜ

Fri, Mar 29, 2019, 3:19 PM

Dear Author;

We have reached a decision regarding your submission to Journal of Turkish Science Education (TUSED).

Based on the reviewer's comments and a close reading of the manuscript, we have decided that your manuscript needs revisions and a second review by the associate editor. You can find suggestions on full text and review form in below. Your manuscript will be re-evaluated, if you fix your article according to the reviewer comments within three weeks. And you should be sure including a cover letter detailing the changes you have made.

Thank you for your interest in the Journal of Turkish Science Education

Sincerely,
Prof. Dr. Salih ÇEPNİ
Editorial Office, Journal of Turkish Science Education

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THE RESULTS OF REVIEW IS BELOW:

GUIDELINES FOR REVIEWERS of JOURNAL OF TURKISH SCIENCE EDUCATION				
Number of the manuscript:1278 Title of the manuscript: Inquiry-based Learning in Indonesia: Portraying Supports, Situational Beliefs, and Teachers' Adoption in Chemistry Teaching				
Type of the research: A- Empirical Articles (X) B- Theoretical Articles ( )				
Please consider following guidelines, while reviewing the manuscript				
	Yes (2)	Partly (1)	No (0)	Not applicable
1- Is the subject of the manuscript original?		X		
2- Does the paper make significant contribution to the science education?		X		
3- Is the language of the manuscript clear and grammatically free of typographical errors?	X			
4- Does the title of the manuscript reflect the research?	X			
5- Does the summary of the manuscript meet the submission guidelines?	X			
6- Does the "introduction" of manuscript include references relevant to the topic of the study?	X			
7- Does the manuscript provide adequate and up-to-date references?		X		
8- Is research question of the study clear and understandable?	X			
9- Does the rationale of the study clear explained using relevant literature?	X			
10- Is the "aim" of the manuscript clear and understandable?	X			
11- Is the methodology chosen suitable to the nature of the topic studied?	X			
12- Is the methodology of the research described clearly?	X			
13- Is there adequate information about the data collection tools used? (only for empirical studies)	X			
14- Are the validity and reliability of data collection tools established? (only for empirical studies)	X			
15- Are the data collection tools suitable for the methodology of the study? (only for empirical studies)		X		
16- Are the findings presented clearly using tables, figures and graphs appropriately?		X		
17. Are the findings discussed adequately adequately considering the research question(s), sub-question(s) or hypothesis?	X			
18. Does the "discussion" section of the manuscript adequately relate to the current and relevant litarature?		X		
19. Does the conclusion section of the manuscript restate the issues in the discussion section?			X	
20. Does the paper make contribution to science educators, science education students, teachers, and people and institutions who produce products and provide services for educational communities?		X		
21. Are there strong consistencies among the parts of the manuscript? (introduction, aim, method, findings, discussion, results and suggestions)	X			

22. Is the each referance in the text suitable to latest version of the Publication Manual of the American Psychological Association (APA) format?		X		

REVIEWERS' SUGGESTIONS

(You can add your comments about the manuscript below and make corrections on the text when necessary)

Please indicate your overall decision relating the manuscript, below

DECISION CATEGORIES

Accep without any change	**[ ]**
Accept, subject to minor revision (gramatically and typograph errors)	**[X]**
Accept, subject to major revision	**[ ]**
Not suitable for publicaiton as is but might be re-submitted after significant revision	**[ ]**
Reject	**[ ]**

Reviewer

Title:

Name-Surname:

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Haris Effendi <hariseffendi@unja.ac.id>

to TUSED/TUFED

Mar 30, 2019, 8:51 AM

Dear Prof Salih Cepni

Thank you very much for the feedback. We are very pleased to hear this news. We will revise the manuscript in the given time and send it back to you as soon as possible.

Sincerely,
Muhammad Haris Effendi Hsb, SPd, MSi, PhD
Head of Master Program of Chemistry Education (Ketua Prodi S2 Pendidikan Kimia)
Lecturer of Science and Chemistry Education
Faculty of Education and Teaching (FKIP)
The University of Jambi - Sumatera - Indonesia
Mobile: +628117404631, +6285372204631
email: hariseffendi@unja.ac.id I hariseffendi@gmail.com

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20 of 35

Haris Effendi <hariseffendi@unja.ac.id>
to TUSED/TUFED

Apr 20, 2019, 1:13 PM

Dear Prof Salih Cepni

I am happy to say that we have finished revising our article. We make some adjustments to make the sentences more concise.
We also made some refinements to link this current article with our just-published article also in TUSED (Volume 16 issue 1, March 2019).
We hope that the revisions we made could fulfill the advice of the reviewers.

Please find attached the revised article but still in the track changes on.

Sincerely Yours

Muhammad Haris Effendi Hsb, SPd, MSi, PhD
Head of Master Program of Chemistry Education (Ketua Prodi S2 Pendidikan Kimia)
Lecturer of Science and Chemistry Education
Faculty of Education and Teaching (FKIP)
The University of Jambi - Sumatera - Indonesia
Mobile: +628117404631, +6285372204631
email: hariseffendi@unja.ac.id | hariseffendi@gmail.com

Motto: Every child is gifted. But, some open their presents later than others. Let's keep fighting to be the one.

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THE REVISED ARTICLE IS BELOW:

Inquiry-based Learning in Indonesia: Portraying Supports, Situational Beliefs, and Teachers' Adoption in Chemistry Teaching

Muhammad Haris EFFENDI-HASIBUAN[1*)], Ngatijo[2)], Fuldiaratman[2)], Urip SULISTYO[1)]

[1]PhD. Universitas Jambi, Jambi-INDONESIA

[2]Dr. Universitas Jambi, Jambi-INDONESIA

ABSTRACT

This study aims at portraying the implementation of inquiry-based learning in chemistry teaching in Jambi city Indonesia during the curriculum reformation era. The search included the pre-existing supports for and the situational beliefs towards the use of the strategy. The results of a questionnaire (n=99) revealed that inquiry has been minimally adopted in this area. Improper supports and beliefs were identified and significantly contributed ($p< .05$) to the low adoption of the strategy ($r= .56^{**}$, $\beta= .32$; and $r= .57^{**}$, $\beta= .35$). These findings might provide explanations for the limited success of the Indonesia curriculum improving the low science achievement of the Indonesian students indicated by the results of the Program for International Student Assessment (PISA). The provision of supportive learning conditions is needed to promote the teachers shift their instructional strategies to improve the Indonesia student science competency.

Keywords: inquiry-based learning, supports for IbL, beliefs on IbL, chemistry teaching

INTRODUCTION

Inquiry-based learning (IbL) is one of the most discussed learning strategies and has drawn many attentions of educational researchers and practitioners around the world. The effectiveness of this strategy has been investigated for decades and the results show that this strategy is powerful in promoting students' diverse learning outcomes (see;Gallagher, 1987; Geier et al., 2008; Hmelo-Silver, Duncan, & Chinn, 2007; Hofstein & Lunetta, 1982; Hofstein, Navon, Kipnis, & Mamlok-Naaman, 2005; Lustick, 2009; Palmer, 2009; Sadeh & Zion, 2009; Zion, Cohen, & Amir, 2007). The outcomes include the development of students' active thinking skill and content-related understanding (Minner, Levy, & Century, 2010), students' ability to formulate hypothesis and questions (Hofstein, Shore, & Kipnis, 2004), and students' performance in science (Sadeh & Zion, 2009). Using this strategy, teachers need to engage students to be more independent in the learning process. Teachers need to dominantly use divergent questions to guide students to successfully complete the lesson (Alessandrini & Larson, 2002; Oliveira, 2010; Windschitl, 2002).

Taken the benefits into account, IbL has been recommended by many curricula in many countries. This includes the curriculum of the United Kingdom (IGCSE, 2009), Australia (Anonim, 2007), the United States of America (NRC, 1996, 2000), China (MOE, 2001), and Indonesia (MoNE, 2003b). Particularly in Indonesia, the use of IbL in science teaching activities had been recommended during the curriculum reformation era by two series of science curricula the so called the competency-based curriculum (*Kurikulum Berbasis Kompetensi*or *KBK* in *bahasa*) issued in 2003 and the curriculum of 2013 (*Kurikulum 2013 or K13* in *bahasa)* issued in 2013. The recommendations of using IbL were on purpose to develop the Indonesian students' competence in science. A translated guideline for the implementation of *KBK* says that:

> "It is advisable in science/chemistry teaching-practice that the most appropriate method be implemented. It is thus essential to use the constructivism approach such as inquiry-based learning when teaching abstract concepts" (MoNE, 2003b, p.12).

Despite of the recommendations, however, the implementation of IbL in Indonesia had been low. According to the results of our previous survey study that involved 70 science teachers (chemistry, physics, and biology) in Jambi city Indonesia, it was found that IbL had been neglected by most of the teachers in this area. The teachers mostly used traditional teaching practices such as lecturing to teach science (Effendi-hasibuan, Harizon, Ngatijo, Mukminin, 2019). The limited use of IbL in Indonesia might had influenced the low science achievement of Indonesian students in a well-known international science assessment called PISA. According to the PISA results, it was found that the rank of Indonesian students in science competence had been low and not been developed since 2003 (OECD, 2003; 2009; 2012; 2015).

Supports is critical in facilitating teachers to use inquiry. In our previous study, we also found that low supports had constrained the participant science teachers to use IbL in their science teaching practices in Jambi city. The minimal supports included the time limitation, the large number of students, the lack of facilities, and the lack of knowledge, skill and experience in using IbL (Effendi-hasibuan, M.H., et. al., 2019). What we found in our previous study was similar with the constraints that had been identified by previous authors.. These included the content-overloaded curriculum (Dai, Gerbino, & Daley, 2011), time limitation (Dickson, Kadbey, & McMinn, 2016), minimal educational facilities (Coppola, 2008; Dai et al., 2011; Dickson et al., 2016; Sundberg, Armstrong, Dini, & Wischusen, 2000; van den Berg & Lunetta, 1984; Zion et al., 2007), minimal funding and technical support (Dickson et al., 2016), classroom mismanagement (Thair & Treagust, 1999, 2003; van den Berg & Lunetta, 1984) that included overloaded classroom population (Dai et al., 2011), IbL-detached assessment system (Chen, 1999; Cook & Taylor, 1994; Dai et al., 2011), teachers' unsupportive knowledge, skill, and experience in using inquiry (Dai et al., 2011; Deters, 2004; Dickson et al., 2016; Thair & Treagust, 1997), and also students' poor skill in conducting practical activities that include the inquiry-based (Dai et al., 2011).

Besides of the presence of supports, belief systems are also significant in encouraging teachers to use IbL in science teaching. Beliefs determine teachers in defining their teaching tasks and in organizing their knowledge and information in responding those tasks (Nespor, 1987). Belief systems are one of the important factors influencing teachers' views about their profession (Kagan, 1992). Beliefs are even more effective in influencing teachers to make classroom decisions than their academic knowledge and capabilities (Nespor, 1987; Pajares, 1992; Wallace & Kang, 2004).

Being embedded personally, belief systems are constituted from personal judgments, evaluations, and assessments towards learning situations (Luft & Roehrig, 2007; Nespor, 1987). Teachers may believe that IbL will only work well in an appropriate learning situation under the presence of sufficient facilities, adequate time, in a classroom with ideal population, etc. Teachers may also believe that their students would not be able to conduct IbL (Colburn, 2000) and thus they believe that students prefer to use direct instructions such as lecturing, rote learning, and drilling to nurture their science competency (Cronin-Jones, 1991). This is compounded with teachers' views on science more as a body of knowledge (Brickhouse, 1990; Duschl & Wright, 1989; Gallagher, 1991) containing facts, principles and concepts (Tobin & Mc Robbie, 1996). Consequently, this situation draws teachers to see their roles utmost as a content-transmitter rather than a facilitator (Tobin & Mc Robbie, 1996). Finally, teachers may feel pressurized without enjoyment in doing inquiry as they look at the fitness of curriculum structure for the IbL implementation (Brickhouse, 1990; Brickhouse & Bodner, 1992; Pajares, 1992). This kind of beliefs that concern on the fitness of pre-existing situations for the IbL implementation- the so called *situational beliefs*- are likely contributive to teachers' decisions of using IbL in their daily teaching practices.

Given the descriptions above, it is obvious that supports and teachers' situational beliefs are two factors that affect the adoption of IbL. An investigation, therefore, needs to be performed to know whether or not IbL is adopted in science classrooms. The search also includes an investigation towards the presence of these factors affecting the implementation, and the relations between these factors and the IbL adoption.

As a part of a big project investigating the fitness of IbL for a chemistry learning situation that is infested by constrains like Indonesia, this study thus involved chemistry teachers to be the respondents. Therefore, the purpose of this study was to investigate the implementation of IbL in chemistry teaching in Jambi city, the presence of supports that were available for the use of IbL, the presence of teachers' situational beliefs towards the use of IbL, and the relation between these factors (the supports and the teachers' situational beliefs) and the adoption of IbL in this area. To guide this study, four questions had arisen:

1. Do chemistry teachers in Jambi city practice the inquiry-based learning?
2. How sufficient are the supports that are available for the adoption of IbL in Jambi city?
3. What situational beliefs do the teachers hold towards the inquiry teaching in Jambi city?
4. How is the relationship amongst supports, situational beliefs, and the adoption of IbL in Jambi city?

METHODOLOGY

This study was conducted in early 2018 involving 107 chemistry teachers to complete a questionnaire-survey. Survey design was chosen for this study on purpose to capture a broad picture of the IbL implementation in chemistry teaching in Jambi city. The teachers had heterogenous demographics comprised of 27 males and 80 females, aged 20-58 years, held bachelor and master degrees, had teaching experience 1-30 years, and were either from states or public schools. The returned questionnaires were collected in a month with 100 per cent return rate. The conduct of this study had passed the ethical clearance protocol prevails in the University of Jambi and the teachers' involvements were proven by consent forms.

The researcher-developed questionnaire initially contained 25 items. This was initiated by designing a conceptual construct containing three dimensions (to cope with the research questions 1, 2, and 3) that involved:1) the teaching practices and the IbL implementation, 2) the available supports to use IbL, and 3) the teachers' situational beliefs towards the use of IbL. This process - guided by information from literatures- was followed by establishing relevant definitions, indicators, and items.

The items were constructed using clear sentences (in *bahasa*) to avoid bias. The questionnaire consisted of one item of multiple response question (Q1.1) that enabled the teachers to cite more than one answer about their regular practice in chemistry teaching and six items of five-level ordinal question (Q1.2-Q1.7) encouraged the teachers to report their regular teaching approaches and frequency use of several strategies (Table 1). The questionnaires also consisted of seven items of five-level ordinal question (Q2.1 – Q2.7) encouraged the teachers to report the supports pre-existed on place for them to use IbL (Table 2), and ten items of Likert scale question (Q3.1 – Q3.10) containing four-level options that encouraged the teachers to express their firm agreement and disagreement regarding their situational beliefs towards the use of IbL (Table 3). Lastly, one item of open-response question that enabled the teachers to share their opinions and reflections about the IbL implementation in their schools (Q4) were also employed in the survey. Having had the prototype, the process was followed by asking an expert's opinions from the chemistry education department of the University of Jambi. This was continued by having member-checking process, continues discussions, and revisions to produce the final trustworthy questionnaires.

A pilot project was then performed with 30 science teachers in Jambi city to obtain a construct validity (item-total correlation and internal consistency tests using SPSS) towards the 23 ordinal scaled items. Meanwhile, the one multiple response (Q1.1) and one open response (Q4) were not applicable for these tests. The results of the tests showed that Q1.4 (asking about the teachers' frequency per month on the use of discussion-based learning), Q1.5 (asking about the teachers' frequency per month on the use of practicum-based learning), Q1.6 (asking about the teachers' frequency per month on the use of information, communication, and technology-assisted learning), and Q2.6 (identifying the fitness of the teachers' workload towards the IbL adoption) was respectively not valid ($p > .05$) and consequently must be removed from the list (see Table 1 and Table 2). As a result, 19 valid ($p < .05$) and reliable items (Cronbach α =.61, .75, .66 for each dimension) were produced and together with the one multiple response and one open response (21 items in total) were then administered to the above-mentioned 107 chemistry teachers. Via data cleaning process, however, only 99/107 (92.5%) teachers – further called respondents (R1, R2, and so forth)- were accepted due to their serious involvement in the survey (individual $SD \geq .3$). The quantitative data collected from the 20 items were then analyzed using descriptive (total, mean, and standard deviation) and multiple regression technic, while the data from the open responses (Q4) were analyzed using thematic coding procedure.

RESULTS and DISCUSSIONS

a) The adoption of IbL in chemistry teaching practices in Jambi city

The first question investigated in this study was 'Do chemistry teachers in Jambi city practice the inquiry-based learning?'. Data in Table 1 revealed that only small number of respondents who reported their use of IbL (nominated by five respondents) while other strategies such as discussion-based learning, conventional experiment, demonstration, and information, communication and technology (ICT)-assisted learning was used by 8-22 respondents. Surprisingly, the major parts of the respondents predominantly used direct instruction strategies in chemistry teaching that included the use of lecturing and drill/exercise (nominated by 99 and 41 respondents). Such respondents' modes on the use of direct instructions were supported by the respondents' preference in providing chemistry contents (mean= 2.14, SD= .75). Consequently, they nearly-often used the direct instruction strategies (mean=3.75, SD= .90) and rarely implemented IbL (mean=2.12, SD=.78). These findings affirm that IbL had been implemented minimally in the chemistry teaching in secondary schools in Jambi city, while the teacher-centered learning approaches -featured by the maximal domination of teachers- were the most implemented instructions.

Table 1. *Chemistry teaching and the implementation of IbL in Jambi city*Chemistry Teaching and Use of IbL	Number of teachers who cite		
Q1.1 What strategies do you use to teach chemistry on regular basis?	Lecturing (99), Drills/exercise (41), Discussion-based learning (22), Conventional experiment (20), Demonstration (10), IT-assisted learning (8), Inquiry-based learning (5), others (0).		
Five-level ordinal items	Mean	SD	Interpretation
Q1.2 Between 1-5, how do you indicate your regular approach in conditioning your students to learn chemistry? (provide contents ---- provide freedom to investigate concepts/ideas)	2.14	.75	Tend to Provide content
Q1.3 How often do you use direct instruction in chemistry teaching in a month? (Never – Very Often)	3.75	.90	Nearly-Often
Q1.4, Q1.5, and Q1.6 were not valid and removed	NA	NA	NA
Q1.7 How often do you use IbL in chemistry teaching in a month? (Never – Very Often)	2.12	.78	Rare
Total	2.67	.81	Broadly Low

Commented [FB1]: ?

Commented [FB2]: Q1.4-Q1.5-Q1.6?

The finding of this study which showed that IbL had been implemented minimally in chemistry teaching practices was not surprising. This fact was similar and even strengthened the findings of our previous results indicating that IbL also minimally used by science teachers (chemistry, physics, biology) in this area (Effendi-hasibuan, et.al., 2019). Previous authors had also identified that student-centered learning strategies including IbL was not adopted maximally in science teaching in Indonesia. Instead, strategies that were teacher-centered mostly prefered by teachers to adopt (Mahady, Wardani, Irianto, Somerset, and Nielson, 1996; Thair and Treagust (1999, 2003). The exclusion of inquiry in teaching, however, is truthfully prevalent and commonly evidenced in Indonesia. Such IbL-exclusion is not only happening in science and chemistry teaching but also in social subject. A recent study conducted by Ekawati (2016) in Java island Indonesia investigating the enactment of *K13* by English teachers showed that the use of inquiry instruction -including the five steps of the scientific approaches -mandated by the curriculum was low. The teachers dominantly used direct and cooperation-based instructions in teaching English. Despite that the subject area she studied was different from what we studied (chemistry), but both results revealed a similar phenomenon concerning the rarity of the IbL implementation in Indonesia. Both findings had presented a wider picture of minimal adoption of IbL in the Indonesia educational setting. Therefore, this low extent of IbL adoption in chemistry might explain why the science ability of Indonesian students remains low in the PISA results during the curriculum reformation era (2003-2018) despite of the recommended use of this strategy in teaching.

b) Pre-existing supports for the IbL Implementation

The second question addressed in this study was 'How sufficient are the supports that are available for the adoption of IbL in Jambi city?'. Data in Table 2 revealed that -amongst the six supports asked in the survey- the respondents reflected that they had only two adequate supports; these were the normal classroom population (mean=3.04, SD=0.95) and the IbL literatures (mean=3.23, SD=0.97). The remaining supports were insufficient that include time allocation, facilities, and IbL-competency of teachers and students. However, in general, their reflection showed that they had unsupportive conditions for the use of IbL (mean=2.77, SD= .15). This minimal support was relevant with and may have caused the minimal use of IbL in Jambi city. These supports are described below one at a time started from the support with the lowest mean.

Table 2. *Reflected supports available for the use of IbL*

Supports available for the use of IbL	Mean	SD	Interpretation
Q2.1 How do you identify time for using IbL? (Very Limited ---- Very unlimited)	2.43	.74	Limited time
Q2.2 How do you identify learning facilities for using IbL? (Highly incomplete---Highly complete)	2.15	.67	Incomplete Facilities
Q2.3 How do you identify classroom population for using IbL? (Highly populous ----Highly sparse)	3.04	.95	Normal classroom
Q2.4 How do you identify your knowledge and skill in using IbL? (Very Low ------ Very High)	2.85	.57	Low competency
Q2.5 How do you identify your students' skill in using IbL? (Very Low ------ Very High)	2.93	.61	Low competency

Q2.6 was not valid and removed	NA	NA	NA
Q2.7 How do you identify IbL literatures in your school? (Highly uncomplete---Highly complete)	3.23	.97	Adequate Literatures
Total	2.77	.15	Low Supports

Commented [FB3]: Q2.6?

The support from the learning facilities

The first low-support was the facilities available for the teachers to use IbL. Data in Table 2 showed that the respondents had reflected incomplete facilities in their schools (mean=2.15 SD= .67). To confirm this finding, data from the open response item (Q4) was used. The respondents described that they had limited materials and equipment such as chemical substances, glasses, balance, cables, etc. Even, some respondents complained due to the lack of laboratory for doing IbL. Coded comments from six respondents concerning this issue are quoted below.

> '…we don't have enough equipment'. (R2)
>
> 'We [I] don't have enough facilities such as substances, glasses, etc., …'. (R22)
>
> '…because I don't have a lab [laboratory]'. (R47)
>
> '…the lack of laboratory'. It [laboratory] is out of service'. (R51)
>
> 'We [I] need school to support the practical activities…'. (R67)
>
> 'Inquiry needs complete facilities but we don't have it [facilities]…'. (R90)

The inadequacy of the equipment and facilities for science learning has been a common issue in Indonesia. This finding was similar with our previous finding showing that 40 out of 70 science teachers admitted that they had inadequate learning facilities for science learning (Effendi-hasibuan, et.al., 2019). It was not uncommon to see that some classrooms were highly challenged to conduct an experiment due to the limitation of basic equipment and chemistry materials. This was even worse as there were no restocking and replacement for years. Moreover, there were no budget of money to buy cables and electrical equipment that hence prohibited teachers to conduct experiment activities like IbL (Coppola, 2008). This was why, the fitness of IbL with low supports of science learning facilities in developing countries had been criticized by Walberg (1991). Such limitation had dragged the teachers to dominantly use the strategies that are independent from the presence of scientific facilities such as lecturing and ignored IbL in their chemistry teaching.

The support from time

The second low-support was the time limitation. Data in Table 2 showed that the respondents had reflected that time is limited for the use of IbL in Jambi city (mean=2.43, SD= .74). This refers to the limited time not only for the conduct of inquiry learning but also for the teachers to make preparation and to assess the results. The respondents commented that they do not have much time to conduct IbL. Comments from six respondents are quoted below.

> '...to be honest I, because of the limited time, had neglected experiments for a long periode of time'. (R5)
>
> '...no time for [conducting] experiment. I am struggling to finish the curriculum [all chemistry contents]'. (R7)
>
> 'Most of the teachers in my school left experiment behind. No time for it'. (R20)
>
> 'Using lecturing, I can deliver more [chemistry contents] than using experiment. I need to be quick'. (R32)
>
> 'I am in a hurry to fullfil my duty. No time for it [IbL]'. (R46)
>
> 'We have limited time. I cannot do anything with this. It takes a long time to do experiments'. (R68)

The insufficiency of time is also a common issue in Indonesia. This finding was similar with our previous finding showing that 55 out of 70 science teachers admitted that they had limited time to conduct IbL (Effendi-hasibuan, et.al., 2019). It was prevalent to see that some classrooms were unable to complete an experiment in chemistry due to the time limitation which regularly only 90 minutes.

In the Indonesia context, the time limitation was generated by the complexity of curriculum that contains many subjects (Hadi, 2002). Students require to learn around 14-17 subjects per semester during the compulsory three years of secondary schooling. Such a complex curriculum was design on goal to educate Indonesian students to become an individual with a complete knowledge about science, social-science, culture and national diversity, and religions. Unarguably, teachers find it difficult to deliver all the curricular contents during the semester. Previous authors argued that the demands of teachers to complete a content-overloaded curriculum may put them in an under-pressure situation whether or not to adopt practical lessons that included inquiry-experiments (Minner et al., 2010; Staer, Goodrum, & Hackling, 1998). This time limitation may have caused why inquiry was abandoned in Jambi city.

The support from the teachers' knowledge, skill, and experience in using IbL

The third low-support was the teachers' knowledge, skill, and experience in using IbL. Data in Table 2 showed that the respondents had reflected their low competency in using IbL (mean=2.85, SD= .57). This finding was similar with our previous finding indicating that 35 out of 70 science teachers admitted for lacking knowledge, skill, and experience in using IbL (Effendi-hasibuan, et.al., 2019). Some respondents reinforced their reflections as in the open-response item (Q4) they expressed their anecdotal understanding about inquiry. Responses from nine respondents are quoted below.

‘...to invite students to do investigation…’ (R9)

‘I know inquiry is used to produce concepts…’ (R11)

‘Inquiry is …to find solutions’ (R12)

‘…to make my students to be more active’ (R27)

‘Students find something important in the experiment...’ (R33)

‘To nurture students' creativity…’ (R36)

‘Challenging students to produce concepts…’(R39)

‘Encouraging students to make conclusions in inquiry…’(R55)

‘Inquiry … is to engage students to prove chemistry concepts‘ (R80)

Based on the teachers' responses, it is seen that the chemistry teachers held only segmented portions of the IbL definition. They simply understood IbL as an activity to investigate something, an activity to find/generate concepts, an activity to make conclusion, an activity to find solution, an activity to make students more active and creative, even they understood IbL as an activity to prove pre-existing concepts. These incomplete understandings of IbL demonstrated minimal compliance with the definition of IbL written in many science literatures. Previous authors defined IbL as a learning activity which is designed by a teacher to nurture students' sense of investigation and to develop their scientific knowledge and procedural skills. Students are engaged to answer self-generated problems in science (Fay & Bretz, 2008; NRC, 2000). Teachers are recommended to use appropriate questions (Alessandrini & Larson, 2002; Colburn, 2000; Oliveira, 2010; Windschitl, 2002) and appropriate scaffolding steps and clues (Davis, 2003; Edwards & Mercer, 1987; Hmelo-Silver et al., 2007) in guiding students to collect data, to interpret findings, and to formulate conclusions. The minimal overlap between the respondents’ anecdotal understandings of IbL and those written in the literatures represented the chemistry teachers’ insufficient competence in using IbL; and this competence limitation had hampered them to perform this teaching strategy in their teaching practices.

The support from the students’ skill in performing practical activities

The next low-support was the students’ skill in performing practical activities that include inquiry-based. Data in Table 2 showed that the respondents had reflected their students’ inadequate competency in conducting practical activities (mean=2.93, SD= .61). Some respondents commented that their students were not ready to find “something” due to low knowledge, skill, and experience to perform the inquiry experiment. Neither were the students able to do IbL experiment, to analyze, nor to conclude; and thus, IbL is not feasible for their students. Comments from eight respondents are quoted below.

'…they had low ability to do this [the inquiry experiment]'(R6)

'…this [inquiry] is not doable for my students here' (R10)

'…the students were not ready…in inquiry they must find [data and conclusion] by themselves' (R15)

'Inquiry experiment is not feasible for my students as they have low experience in using it'(R25)

'…It [doing inquiry] is easy to say but difficult to do, particularly with my students' (R31)

'…they [students] are unable to analyze and conclude'(R37)

'…they have low skill in doing experiment' (R40)

'I don't know if they [the students] can do it [inquiry]' (R50)

The teachers' reflections concerning the students' inadequate competency in performing practical activities including IbL looked unsurprising. Based on anecdotal data - despite that a very small number of Indonesian students have been participating and gaining respected achievements in several science competitions such as the Physics competition, etc., - it shows however that the majority of Indonesian students hold inadequate competency in science that include chemistry; and this is more like the "iceberg phenomenon" with the major parts are under "the sea-surface". The former may have supportive learning environments (from schools, teachers, parents, facilities, fund) but the latter may have the different ones.

Concerning this issue, however, students should not be blamed. In our opinion, the weak competency of students in conducting inquiry was not solely the flaw of the students but also due to the teachers' negligent in engaging the students in an IbL experiment. It is assumed that the students' weaknesses may have a reciprocal relation with the teachers' failure to implement IbL. This means that the less the teachers engaged the students in an IbL activity the lower the students were exposed and familiarized with IbL (to get skill and experience of using it); and vice versa. Despite that the students were intellectually different; however, we believe that the regular students would normally be able to perform IbL experiment if they were routinely invited to do so to get better skills in using it. Previous authors had proven that engaging high school chemistry students in an inquiry-type practical activity would bring improved students' ability in conducting inquiry itself and increased ability in composing questions compared to those that were learning chemistry using traditional practical activity (Hofstein et al., 2005). In this stance, we may agree that the students' poor capability may have not fit for the use of IbL, but at the same time we argue that this had also been the resultant of the poor chemistry teaching practices in Jambi city that excluded IbL.

The support from classroom population

The next support for the IbL implementation was the number of students occupying a classroom. Data in Table 2 showed that the respondents had reflected that they had normal classroom containing reasonable number of students (mean=3.04, SD= .95). It is advisable, nowadays, that the teachers perceive that the classroom population in Jambi city has been ideal for IbL. This is due to the implementation of a national regulation issued in 2018 (at the time this research was conducted) which states that each classroom can only contain maximum of 36 students. In our opinion, however, having 36 students per classroom remains not ideal for IbL as the teachers would have to guide approximately nine groups containing approximately four students (taken that approximately four students per group is ideal for a practical activity) in a limited time and without assistance. This would provide a big pressure for the teachers to accomplish the lesson. We suggest that having 20-25 students will be more ideal in which teachers would have to guide 5-6 groups in such condition; and that would reduce stress and tensions during the lesson. This suggestion is similar with the recommendation of Habibi, Mukminin, Sofwan, & Sulistiyo, (2017) for the successful enactment of *K13* that each classroom ideally contains approximately 25 students.

Apart from that, however, the teachers' reflection concerning the up-to-date classroom size did not represent the classroom-population tradition operationalized before 2018. At that time, a classroom could contain up to 45 students per classroom that made classroom was very crowded and unfeasible for IbL. Comments from five respondents who reported that they had included IbL in their regular chemistry teaching (see Table 1) are quoted below.

> 'I found it difficult to use IbL before as I had many students...'(R3)
>
> '…due to the number of students that was very large. It was difficult to guide them [in inquiry]' (R17)
>
> 'It was hard for me to order them as there were 39 students in the classroom before'…'(R29)
>
> 'It produced big noise as the classroom was very crowded before…' (R81)
>
> '…the students [number] were very large and challenged me…'. (R95)

Given the fact about the classroom size, it was widely-known that the number of students occupying a classroom in Indonesia was large. It could be approximately 30-45 students per classroom that served an enormous practical challenge for teachers to implement IbL. This situation reduced the teachers' intention to conduct IbL due to the clamor, uproar and disorder conditions. Undoubtedly, the teachers preferred to employ a teacher-centered instruction such as lecturing for their overcrowded classrooms (Thair & Treagust, 1999; van den Berg & Lunetta, 1984).

The support from literatures and references

Finally, the respondents reflected that they had adequate references about IbL in their schools (mean=3.23, SD= .97). They may have these from multiple resources such as books, articles, internets, etc. This means that the IbL references was not one of the shortfalls for the use of IbL in Jambi city.

c) Situational Beliefs on the use of IbL

The third question investigated in this study was 'What situational beliefs do the teachers hold towards the inquiry teaching?'. Data in Table 3 revealed that all the respondents believed that their learning situations were ill-fit for inquiry (mean=1.67, SD= .53). They disbelieved that IbL can be successfully implemented under limited time (mean=1.40, SD= .57) and facilities (mean=1.38, SD= .58). They disbelieved that inquiry was viable in a crowded classroom (mean=1.60, SD= .60), and with their and the students' low capabilities (mean=1.95, SD= .60, and mean=1.88, SD= .52). These negative beliefs were parallel with the low available-supports for the use of inquiry as discussed before. These beliefs seemingly reflected their consistent attitude in looking at the situations where the learning took place. Consequently, the respondents were unsure that they and their students would enjoy using IbL under such conditions (mean=1.67, SD= .70, and mean=1.53, SD= .61). They also disliked their roles to be facilitators (mean=1.72, SD= .58) as they disbelieved that their students need inquiry to learn chemistry (mean=1.61, SD= .61). Finally, they were in doubt that the overloaded curriculum was fit for the IbL implementation (mean=1.97, SD= .48).

Table 3. *Teachers' beliefs on the IbL implementation*

Teachers' beliefs on IbL (1=strongly disagree, 2= disagree, 3= agree, 4=strongly agree)		Mean	SD	Interpretation
Q3.1.	IbL can be implemented under pre-existing time	1.40	.57	Broadly disagree
Q3.2.	IbL can be implemented using pre-existing facilities	1.38	.58	
Q3.3.	IbL can be implemented with my crowded classroom	1.60	.60	
Q3.4.	By my current knowledge and skill, I can do IbL	1.95	.60	
Q3.5.	IbL can be implemented by my regular students.	1.88	.52	
Q3.6.	IbL provides enjoyment for me	1.67	.70	
Q3.7	IbL provides enjoyment for my students	1.53	.61	
Q3.8.	IbL is viable for the Indonesia curriculum	1.97	.48	
Q3.9.	My students need IbL to learn chemistry	1.61	.61	
Q3.10.	I prefer to help/facilitate students rather than telling them contents	1.72	.58	
Total		1.67	.53	

The teachers' unsupportive situational beliefs on the use of IbL, however, is not only evidenced in Indonesia. Previous authors had identified these beliefs drew teachers -in some countries- to retain the traditional teaching practices. Science teachers often see that this strategy will only work well with capable students (Colburn, 2000). Teachers who believe that their students have the capacity to perform inquiry-based activities will tend to include these activities in their teaching practices in order to achieve the goals of the curriculum (Wallace & Kang, 2004). On the other hand, teachers studied by Cronin-Jones (1991) did not use inquiry-based activities since they believed that their students needed explicit direction, and so considered that the students would be better taught by repeated drills and exercises.

Teachers' unsupportive beliefs about science teaching and learning also affect the ways in which they see the curriculum, instructional activities, and their roles (Brickhouse, 1990; Brickhouse & Bodner, 1992; Pajares, 1992). Many teachers see science more as a body of knowledge (Brickhouse, 1990; Duschl & Wright, 1989; Gallagher, 1991) containing facts, principles and concepts (Tobin & Mc Robbie, 1996). As a result, many teachers view their roles in science-teaching as being a curriculum-content transmitter (Tobin & Mc Robbie, 1996) rather than as being a facilitator. They believe that the most important outcome for students is to be able to successfully negotiate examinations and to be well-prepared for the next educational level (Colburn, 2000). Problem solving skills are nurtured by repeated drills and exercises since these teaching-strategies are believed to be the best way to equip students to face the examinations (Cronin-Jones, 1991); and thereby they are enjoying these practices. From this point of view, it thus appears that the unsupportive beliefs on the learning situations might have influenced the respondents' decisions not to use IbL in chemistry teaching practice in Jambi city.

d) Relations amongst the dimensions

The findings of this study so far have indicated that the supports and the beliefs head to the same direction with the inquiry implementation in Jambi city. These three dimensions have seemingly related one another. To emphasize this connection as well as to answer the final question of this study that ask, 'How is the relationship between supports, situational beliefs, and the adoption of IbL in Jambi city?', a multiple regression analysis was employed. Data in Table 4 reveal that the three dimensions intercorrelated significantly ($p< .05$) with adequate coefficient of Pearson. The inquiry adoption correlates significantly with the supports ($r = .56^{**}$) and the beliefs ($r = .57^{**}$), while the supports correlates significantly with the beliefs ($r = .68^{**}$). These results indicate that the lower/bigger the available supports the lower/bigger the teachers' beliefs on the learning situations wherein IbL is feasible to do, and the lower/bigger the adoption of IbL.

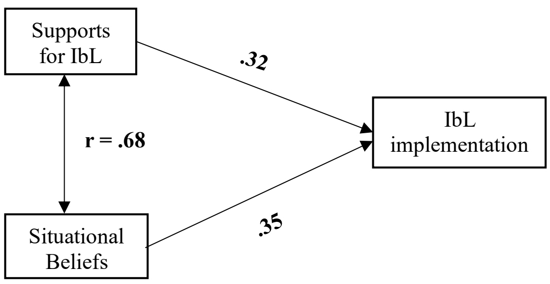
Table 4. *The contribution of the supports and the situational beliefs to the IbL adoption.*

Inter-dimension correlations	a	b	c	Standardized Beta Coefficients [a]	R Square	ANOVA [a]
a Pearson Corr	1					
Sig. (2-tailed)						
N	99					
b Pearson Corr	$.56^{**}$	1		β= .32		
Sig. (2-tailed)	.000			p-value<.05	R^2= .382	p-value =.000[b,c]
N	99	99				
c Pearson Corr	$.57^{**}$	$.68^{**}$	1	β= .35		
Sig. (2-tailed)	.000	.000		p-value<.05		
N	99	99	99			

***. Correlation is significant at the 0.01 level (2-tailed).*(*a. IbL adoption, b. supports, c. teachers' beliefs*)

The significant correlations amongst the three dimensions are reasonable. This may have come from the straight forward responses of the respondents towards the learning conditions. The respondents who had been submerging in the unsupportive learning situations (in this case is Jambi city) had certainly been un-hesitant in expressing their firm views that the poor supports were ill-fit for the use of inquiry learning. What they perceived about the supports were clearly reflected in their beliefs and then manifested in their classroom actions. This suggests that the respondents involved in this study had been reported their natural thoughts, attitudes, and behaviors- with no bias and ambiguity- regarding this issue that IbL is not viable in Jambi city under those conditions, so that they ignored it even though its use has been mandated by the curriculum.

Figure 1. *Direct effects from the supports and the beliefs to the IbL implementation*



Data in Table 4, moreover, also indicate that the supports and the teachers' beliefs had a significant simultaneous effect (ANOVA $p<.05$) with 38.2% contribution ($R^2=.382$) to the adoption of IbL. These also had significant direct effects ($p<.05$) to the implementation of IbL with similar magnitudes ($\beta= .32$ and $\beta= .35$). These data uncover a fact that the supports and the situational beliefs share similar contributions on affecting teachers to use or to neglect IbL in their teaching activities (Figure 1). At this point we can be more confident to say that the minimal implementation of IbL- besides by other unobserved constraints- have been constituted by the low supports and the teachers' beliefs towards their learning situation in Jambi city. This finding, has back-up from the statements of Nespor (1987), Pajares (1992), and Wallace and Kang (2004) in which teachers' beliefs on the learning situations are powerful in influencing teachers to make classroom decisions. In addition, this finding may have enriched the reservoir of evidence (aforementioned in the literatures above) showing that supports (called constraints when it is minimal) and teachers' beliefs on learning situations (situational beliefs) affect science teachers whether to adopt or to neglect IbL in science teaching.

CONCLUSIONS

In this study, we have designed and used a 21-item valid and reliable survey-questionnaires aimed at looking at the adoption of the inquiry-based learning (IbL) in chemistry teaching recommended by the science curriculum in Indonesia. In this study, we have also looked at the underlying factors that influence the IbL implementation and the relationships between these factors and the IbL adoption. The finding of this study showed, despite that the use of IbL had been recommended by the curriculum, that the IbL was minimally implemented by the chemistry teachers in Jambi City. They predominantly used the more traditional teaching strategies such as lecturing to teach chemistry. Unsupportive learning conditions and situational beliefs, however, had been emerged as the key factors for the minimal adoption. This included six supports and ten beliefs which had showed significant contributions to the low adoption of IbL in this area.

The findings of this study, nonetheless, embodied some limitations. While the findings will potentially contribute the sort of evidence figuring out the implementation of IbL that include the aspects promoting its implementation; differences of the inquiry use between teachers in cities, suburbs, and rural areas are probably there. Differences between teachers in various science disciplines such as Physics, Biology, and Mathematic should also be considered. Future studies, thus, may look at the implementation of IbL in that diverse circumstances. Future studies may also look at the necessary adaptation strategies that may help teachers to successfully implement inquiry-based learning as well as to overcome the interfered-constraints. The issue of finding alternative strategies of IbL that include alternative steps and guiding technics had been recommended by previous authors when they saw the urgency of making IbL fit with diverse learning environments (Anderson, 2002; Furtak 2006; Hmelo-Silver et al., 2007; Zohar, Degani, & Vaaknin, 2001).

This study, therefore, provides substantial information for the educational authorities in Indonesia to take any possible actions to resort this issue. This involves the provision of rational time, manageable classroom population, adequate scientific facilities, appropriate workshops and trainings, and any other possible supports that are important to facilitate teachers to adopt and implement this strategy. Jonathan, (1998) argued that ignoring the fitness of supports and teachers' belief sets will only bring a limited success for the initiative of the curriculum reformation. The findings of this study could provide important information for other teachers in other constraint-infested areas who are struggling to use inquiry in their science teaching practices. Finally, the limited supports and ill-fit situational beliefs that had affected the minimal adoption of IbL in the chemistry teaching in Indonesia (the science teaching in global speaking) might have contributed to the minimum level of science competency of Indonesian students in the PISA results.

REFERENCES

Alessandrini, K., & Larson, L. (2002). Teachers bridge to constructivism. *Clearing House, 75*, 118-121.

Anderson, R.D. (2002). Reforming science teaching: What research says about inquiry. *Journal of Science Teacher Education*, *13*(1), 1-12.

Anonim. (2007). *Senior syllabus chemistry 2007*. Brisbane: Queensland studies authoritiy Retrieved from http://www.qsa.qld.edu.au/learning/1952.html.

Brickhouse, N. (1990). Teachers' beliefs about the nature of science and their relationship to classroom practice. *Journal of Teacher Education, 41*(3), 53-62.

Brickhouse, N., & Bodner, G. M. (1992). The beginning science teacher: Classroom narratives of convictions and constraints. *Journal of Research in Science Teaching, 29*(5), 471-485.

Chen, Y. (1999). Tradition and innovation in the Chinese school curriculum. *Research in Education* (61), 16-28.

Colburn, A. (2000). An Inquiry Primer. *Science Scope, 23*(6), 42-44.

Cook, A., & Taylor, N. (1994). Robust adaptive processes: The case for laboratory assistants in Fiji high schools *Journal of Science and Mathematics Education in South East Asia, 17*(2), 7-15.

Coppola, B. P. (2008). Selamat datang di Indonesia: Learning about chemistry and chemistry education in Indonesia. *Journal of Chemical Education. , 85*(9), 1204-1209.

Cronin-Jones, L. L. (1991). Science teacher beliefs and their influence on curriculum implementation: Two case studies. *Journal of Research in Science Teaching, 28*(3), 235-250.

Dai, D. Y., Gerbino, K. A., & Daley, M. J. (2011). Inquiry-Based Learning in China: Do Teachers Practice What They Preach, and Why? *Front. Educ China, 6*(1), 139-157. doi: 10.1007/s11516-011-0125-3

Davis, E. A. (2003). Prompting middle school science students for productive reflection: Generic and directed prompts. *Journal of the Learning Sciences, 12*, 91-142.

Deters, K. (2004). Inquiry in the chemistry classroom. *The Science Teacher, 71*(10), 42-45.

Dickson, M., Kadbey, H., & McMinn, M. (2016). Correlating Beliefs and Classroom Practices of Public School Science Teachers in Abu Dhabi, U.A.E. *Turkish Science Education*, *13*(3), 161-172.

Duschl, R. A., & Wright, E. (1989). A case study of high school teachers' decision making models for planning and teaching science. *Journal of Research in Science Teaching, 26*(6), 467-501.

Edwards, D., & Mercer, N. (1987). *Common knowledge: The development of understanding in the classroom*. London: Routledge.

Effendi-hasibuan, M.H., Harizon, Ngatijo, Amirul Mukminin, (2019), The Inquiry-based Teaching Instruction (IbTI) in Indonesian Secondary Education: What Makes Science Teachers Successful Enact the Curriculum? *Turkish Science Education*, *16*(1), *in press.*

Ekawati, Y. N. (2016). The Implementation of Curriculum 2013: A Case Study of English Teachers' Experience at SMA LAB School in Indonesia. *English Language Learning Development (ELLD) Journal, 7*(1), 84-90. doi: URL:http://digilib.uinsgd.ac.id/id/eprint/4531

Fay, M. E., & Bretz, S. L. (2008). Structuring the level of inquiry in your classroom. *The Science Teacher, 75*(5), 38-42.

Furtak, E. M. (2006). The problem with answers: An exploration of guided scientific inquiry teaching. Science Education, 90, 453-467.

Gallagher, J. J. (1987). A summary of research in sience education. *Science Education, 71*(3), 277-384.

Gallagher, J. J. (1991). Prospective and practicing secondary school science teachers' knowledge and beliefs about the philosophy of science. *Science Education, 75*(1), 121-133.

Geier, R., Blumenfeld, P. C., Marx, R. W., Krajcik, J. S., Fishman, B., Soloway, E., & Clay-Chambers, J. (2008). Standardized test outcomes for students engaged in inquiry-based science curricula in the context of urban reform. *Journal of Research in Science Teaching, 45*(8), 922-939.

Habibi, A., Mukminin, A., Sofwan, M., & Sulistiyo, U. (2017). Implementation of Classroom Management by English Teachers at High Schools in Jambi, Indonesia. *Studies in English Language and Education, 4*(2), 172-189. doi: http://doi.org/10.24815/siele.v4i2.6104

Hadi, S. (2002). *Effective teacher professional development for the implementation of realistic mathematics education in Indonesia.* (Thesis), University of Twente, Enschede.

Hmelo-Silver, C. E., Duncan, R. G., & Chinn, C. A. (2007). Scaffolding and achievement in PBL and IL: A response to Kirschner et all. *Educational Psychologist, 42*(2), 99-107.

Hofstein, A., & Lunetta, V. N. (1982). The role of the laboratory in science teaching: Neglected aspects of research. *Review of Educational Research, 52*(2), 201-217.

Hofstein, A., Navon, O., Kipnis, M., & Mamlok-Naaman, R. (2005). Developing students' ability to ask more and better questions resulting from inquiry-type chemistry laboratories. *Journal of Research in Science Teaching, 42*(7), 791-806.

Hofstein, A., Shore, R., & Kipnis, M. (2004). Providing high school chemistry students with opportunities to develop learning skills in an inquiry-type laboratory: A case study. *International Journal of Science Education, 26*(1), 47-62.

IGCSE. (2009). United Kingdom Chemistry Syllabus 0620 Retrieved 1 April 2011, from www.cie.org.uk/docs/dynamic/5140.pdf

Jonathan, D. J. (1998). Curriculum reform in South Africa: A critical analysis of outcome-based education. *Cambridge Journal of Education 28*(3), 321-331.

Kagan, D. M. (1992). Professional growth among preservice and beginning teachers. *Review of Educational Research*, 62(2), 129-169.

Luft, J.A., & Roehrig. G.H (2007). Capturing science teachers' epistemological beliefs: The development of the teachers' beliefs interview. *Electronic Journal of Science Education,* 11(2), 38-63

Lustick, D. (2009). The failure of inquiry : Preparing science teachers with an authentic investigation. *Journal of Science Teacher Education 20*, 583-604.

Mahady, R., Wardani, I. G. A. K., Irianto, B., Somerset, H. C. A., & Nielson, D. (1996). *Secondary education in Indonesia:Strengthening teacher competency and student learning*. Report for the Ministry of Education and Culture, Jakarta Indonesia. Jakarta Indonesia.

Minner, D. D., Levy, A. J., & Century, J. (2010). Inquiry-based science instruction—what is it and does it matter? Results from a research synthesis years 1984 to 2002. *Journal of Research in Science Teaching, 47*(4), 474-496.

MOE. (2001). Guidelines on curriculum reform of basic education (experimental) (Jichu jiaoyu kecheng gaige gangyao (Shixing). Beijing: Ministry of Education.

MoNE. (2003b). Kurikulum 2004 standar kompetensi (Curriculum 2004 standard for competency). Retrieved 22 Nopember 2009, from Pusat kurikulum Balitbang Depdiknas http://www.smantas.net/Kimia.pdf

Nespor, J. (1987). The role of beliefs in the practice of teaching. *Journal of Curriculum Studies, 19*, 317-328.

NRC. (1996). *National Science Education Standards*. Washington, DC: National academy press.

NRC. (2000). *Inquiry and the national science education standards: A guide for teaching and learning*. Washington, DC: National Academy Press.

OECD. (2003). Student performance in reading, mathematics and science. Retrieved 27 July 2012, from OECD http://www.oecd.org/education/preschoolandschool/programmeforinternationalstudentassessmentpisa/34002454.pdf

OECD. (2009). Student performance in reading, mathematics and science. Retrieved 27 July 2012, from http://www.pisa.oecd.org/dataoecd/54/12/46643496.pdfhttp://www.cmec.ca/Publications/Lists/Publications/Attachments/254/PISA2009-can-report.pdf

OECD. (2012). PISA 2012 Results in Focus: What 15-year-olds know and what they can do with what they know. Retrieved 9 Juni 2015, from OECD http://www.oecd.org/pisa/keyfindings/pisa-2012-results-overview.pdf

OECD. (2015). PISA 2015: Results in Focus. Retrieved 10 January 2017, from OECD https://www.oecd.org/pisa/pisa-2015-results-in-focus.pdf

Oliveira, A. W. (2010). Improving teacher questioning in science inquiry discussions through professional development. *Journal of Research in Science Teaching, 47*(4), 422-453.

Pajares, M. F. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research, 62*(3), 307 - 332.

Palmer, D. H. (2009). Student interest generated during an inquiry skills lesson. *Journal of Research in Science Teaching, 46*(2), 147-165.

Sadeh, I., & Zion, M. (2009). The development of dynamic inquiry performances within an open inquiry setting: A comparison to guided inquiry setting. *Journal of Research in Science Teaching, 46*(10), 1137-1160.

Staer, H., Goodrum, D., & Hackling, M. (1998). High school laboratory work in western Australia: Opennes to inquiry. *Research in Science Education, 28*(2), 219-228.

Sundberg, M. D., Armstrong, J. E., Dini, M. L., & Wischusen, E. W. (2000). Some practical tips for instituting investigative biology laboratories. *Journal of College Science Teaching, 29*(5), 353 - 359.

Thair, M., & Treagust, D. F. (1997). A review of teacher development reforms in Indonesian secondary science: The effectiveness of practical work in biology. *Research in Science Education, 27*(4), 581-597.

Thair, M., & Treagust, D. F. (1999). Teacher training reforms in Indonesian secondary science: The importance of practical work in physics. *Journal of Research in Science Teaching, 36*(3), 357-371.

Thair, M., & Treagust, D. F. (2003). A brief history of a science teacher professional development initiative in Indonesia.. *International Journal of Education Development, 23*, 201-213.

Tobin, K., & Mc Robbie, C. J. (1996). Cultural myths as constraints to the enacted science curriclum. *Science Education, 80*, 223-241.

van den Berg, E., & Lunetta, V. N. (1984). Science teacher diploma programs in Indonesia. *Science Education, 68*(2), 195-203.

Walberg, H. J. (1991). Improving school science in advanced and developing countries. *Review of Educational Research, 61*(1), 25-69.

Wallace, C. S., & Kang, N. H. (2004). An investigation of experienced secondary science teachers' beliefs about inquiry: An examination of competing belief sets. *Journal of Research in Science Teaching, 41*(9), 936-960.

Windschitl, M. (2002). Framing constructivism in practice as the negotiation of dilemmas: An analysis of the conceptual, pedagogical, cultural, and political challenges facing teachers. *Review of Educational Research, 72*, 131-175.

Zion, M., Cohen, S., & Amir, R. (2007). The spectrum of dynamic inquiry teaching practices. *Res Sci Educ, 37*, 423-447.

Zohar, A., Degani, A., & Vaaknin, E. (2001). Teachers’ beliefs about low-achieving students and higher order thinking. Teaching and Teacher Education, 17(4), 469-485.

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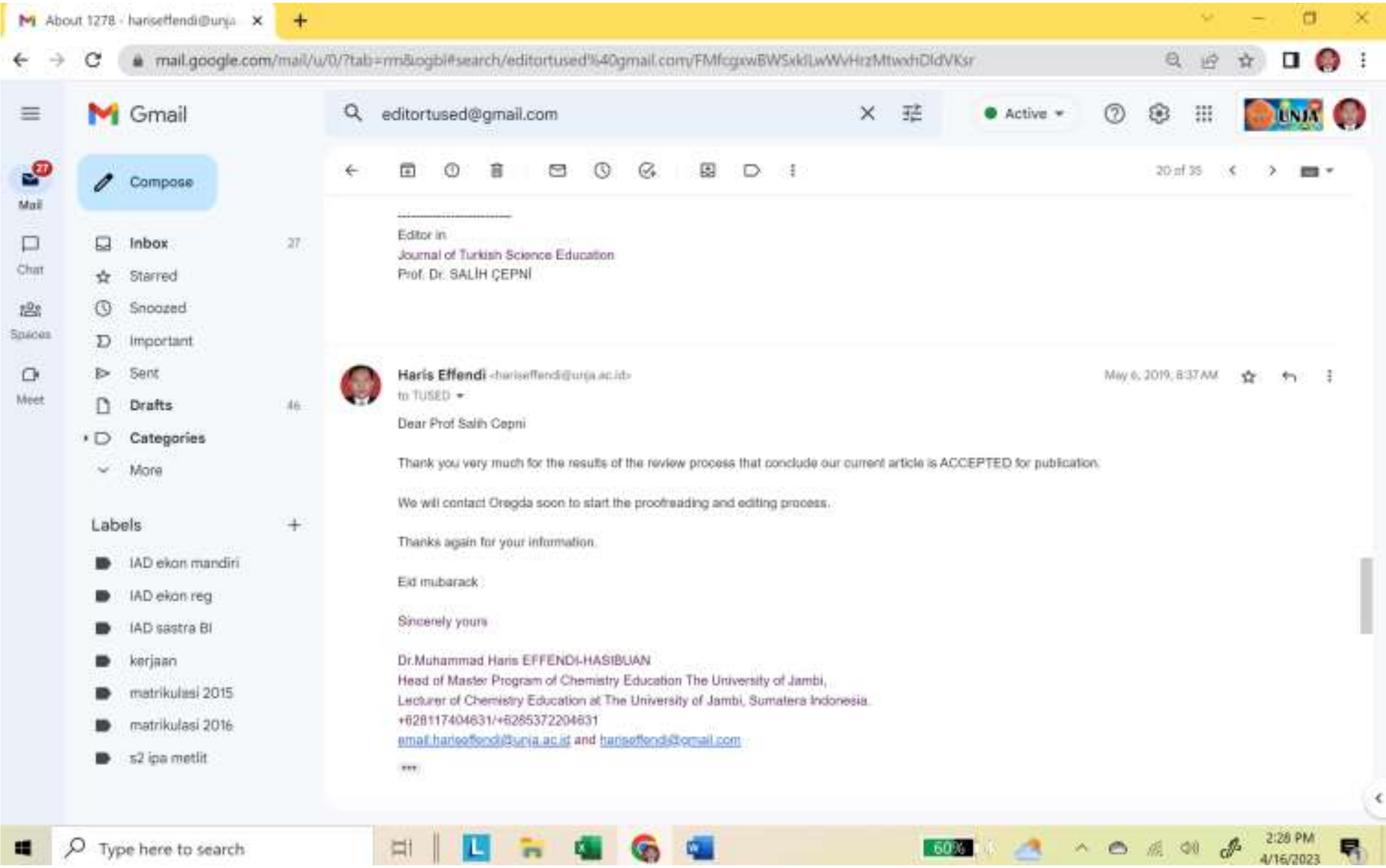

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Thanks again for your information.

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Dr.Muhammad Haris EFFENDI-HASIBUAN
Head of Master Program of Chemistry Education The University of Jambi,
Lecturer of Chemistry Education at The University of Jambi, Sumatera Indonesia.
+628117404631/+6285372204631
email hariseffendi@unja.ac.id and hariseffendi@gmail.com