THE DEVELOPMENT OF LECTORA INSPIRE MEDIA WITH
SCIENTIFIC BASED APPROACH FOR TEACHING REDUCTION-
OXIDATION REACTION THROUGH PROFESSIONAL LEARNING
COMMUNITY

Ucu Cahyana, Yusmaniar, Irma Komala
Universitas Negeri Jakarta (INDONESIA)

Abstract

In the era of information and communication technology, teaching methods and computer-based
teaching is increasingly being used to improve the quality of learning in the classroom. One of the
techniques to develop the learning process is to use interactive media. Interactive media can facilitate
students to get a better understanding of Reduction-Oxidation Reactions and assist teachers in the
teaching with a scientific approach through the production of Lectora Inspire media in learning the topic of
Reduction-Oxidation Reactions for high school students. In the development of instructional media,
researchers collaborate with teachers of other subjects through the implementation of Professional
Learning Community. Research and development methodology is implemented as the research
approach. The stages of the study consisted of a needs analysis, instructional media development,
eligibility test, and product revision. The results of feasibility studies by content experts showed that the
instructional media, Lectora Inspire, categorized as good where the r-value is 0.70. The results of
eligibility test by media experts shows that learning media, Lectora Inspire, categorized as good where
r-value is 0.79, while the results of feasibility studies by Teaching and Learning experts show the
instructional media, Lectora Inspire, categorized as excellent where the r-value is 0.81. The results of
eligibility test in small groups and large groups showed that the presentation and the media content
achieve very good results where the interpretation of the score ranging from 75-100. The results of
this study indicates that through Professional Learning Community could produce and develop
teaching materials, in the form of Lectora Inspire, properly and suitable as a chemistry learning media
for the topic of Reduction-Oxidation Reactions at the high school level.

Keywords : Scientific Based Approach, Lectora Inspire, Professional Learning Community, Reduction-
Oxidation Reactions.

1 INTRODUCTION

In the 21st century teaching and learning computer aided or commonly called e-learning has been
used in the era of information and communication technology today. Becoming very important in fields
where access to learning materials needs to be brought about Effectively and efficiently, e-learning is
firmly embedded in many of the current educational theories (Celik S., 2012). The use of e-learning
which supported by multimedia (text, sound, images, animation or video) is preferred by students for
learning activities in class. Multimedia will help learners become more active and creative in learning,
and makes the educator, as a facilitators, who provide convenience environment for learners to learn
and not as a giver of instruction to students. Multimedia applications are software which are designed
or built by combining elements such as text, sound, images, animation or video. The term of
multimedia in learning is usually called CALL (Computer-Assisted Language Learning).

One of the attempts to assist in the process of learning and teaching is by using an interactive media.
With the interactive media, is expected to enhance students' understanding and help teachers in the
teaching process. One such attempt is the use of learning media called Lectora Inspire.

Lectora Inspire is one of the software used to study media. The advantages of this software is that it
can use in the form of presentations, interactive CD and online via the web. Software Lectora Inspire
equipped with a program of making audio, video, and exercises, so it is possible for an effective and
interactive multimedia. In addition there are flypaper application, Snagit and Camtasia which very
useful to support the complexity and flexibility of media created. So the Lectora Inspire media is an
appropriate media to use during lessons.

Based on previous research, media Lectora Inspire also developed in learning Fiqh (Febriyanto, 2013)
which can improve learning achievement. But in this study on the application of Lectora Inspire yet to
be realized optimally. The results of this study, triggers for conducting research in developing instructional media Lectora Inspire on the topic Reduction-Oxidation Reactions that can make learning more interesting and interactive by using the application in Lectora Inspire more leverage.

Based on observations made at SMAN 58 Jakarta, 86.7% stated that students are less interested in topics reduction-oxidation reaction as presented monotonous and 96.7% said that they need a medium of learning interesting and interactive. Interviews with several teachers in the school, teachers do not know the software Lectora Inspire. More of them are using media that is already widely known as Powerpoint. As we know that many efforts have been made to optimize the performance of teachers. These efforts did have an impact on improving teacher performance though not significantly. Criticism and feedback on teacher performance is often delivered at training forums and seminars and discussions. One way to overcome the things above is by establishing Community Learning Professional or Professional Learning Community (PLC), which is a community that consists of several subject teachers who joined with the aim of sharing experiences and seek common solutions to problems that are owned by each subject (Dufour, 2004). Until now there are communities that are Deliberation Master subjects (MGMPs), this community consists only of the teachers of the course subject areas so that the problems that arise when teaching in the classroom is usually relatively the same. Therefore, the use of Lectora Inspire Learning Media is expected to assist students in improving understanding of the Reduction-Oxidation Reactions material in class X SMA Negeri Jakarta through the implementation of Professional Learning Community (PLC).

Group PLC in media development research to be carried out are composed of teachers who are competent in aspects of Information and Communication Technology (to discuss the design and Software Lectora Inspire) and chemical material aspects (to discuss learning materials).

2 METHODOLOGY

The research method is Research and Development. The procedure is according to research development research development procedures. Three important things that must be implemented in the development of research activities. The first step is the analysis of needs (needs assessment), both the development of products (in which there are stages of design and development), and the final step is testing the product (including the validation test to experts and tests to students). Data collection techniques in this study of interviews and questionnaires filled out by chemistry teachers, teachers who are members of the PLC and needs analysis questionnaire, filled out by students. For learning media assessment, self-assessment questionnaire given to media experts, materials, teachers, and students. At the stage of feasibility studies by experts, data retrieval research is done by using the inter-rater reliability testing. Reliability is used inter rater reliability test coefficient intraclass correlation (ICC) on Fleiss Kappa (Wuensch, 2007).

3 RESULTS

Products developed in this study is the media Lectora Inspire for class X SMA with the topic Reduction-Oxidation Reactions which done through the implementation of Professional Learning Community (PLC). Professional Learning Community carried out on phase of development of instructional media Lectora Inspire by collaborating with teachers of Chemistry, Indonesian, and Information and Communication Technology (ICT), which comes from the school. There are three steps that must be carried out in research activities, namely the development of needs analysis phase, the stage of media development and test phase of the resulting media.

3.1 Need Analysis Phase

The method used in conducting needs analysis phase is an interview and spreading questionnaires to the students of class XI and subject teachers of Chemistry. This needs analysis aims to determine the use of media learning, especially learning media Lectora Inspire on learning chemistry of students and teachers. At this stage it is also known that the media commonly used in teaching less attractive so that we can know that students and teachers need appropriate learning media as needed. Here is the result of a needs analysis phase:

3.1.1 Result of Student Needs Analysis

Analysis of the needs of students conducted by distributing questionnaires to 30 students of class XI. After the distribution of the questionnaire, the obtained data is as follows;
1 A total of 86.7% of students feel less interested in the topic because the oxidation-reduction reactions are presented in the classroom monotony.

2 A total of 67.7% of students have difficulty in distinguishing the reduction reaction and the oxidation reaction.

3 A total of 93.3% of students believe the role of media is very important for student learning in the learning process chemistry.

4 A total of 86.7% of students find the topic of oxidation-reduction reactions more interesting to learn if using instructional media.

5 As many as 96.7% of students stated media that there are less equipped animation.

6 A total of 96.7% of students stated explanation oxidation-reduction reactions more interesting if it comes to animation.

7 A total of 100% of students want the media chemistry learning more interesting if well-designed full color.

8 A total of 93.3% of students stated if the material explanation oxidation-reduction reactions are presented in the form of pictures or schemes more easily understood.

9 A total of 86.7% of students feel more motivated to learn the chemical if there is a learning media in the form of software.

10 A total of 93.3% of students want Lectora Inspire media featuring animation that is applied from everyday life.

11 A total of 96.7% of students want that media Lectora Inspire can be easily understood by using language that is simple, straightforward and communicative.

12 A total of 96.7% of students want the suitability of the background and color selection can make a Lectora Inspire media becomes more interesting and fun.

13 A total of 93.3% of students believe that the media is Lectora Inspire should be supplemented by the questions and discussion to examine kepahaman students.

14 A total of 96.7% of students stated that Lectora Inspire media users be required to support the learning process.

15 A total of 96.7% of students want their chemistry learning media development in the form of software such as Lectora Inspire especially material reduction-oxidation reactions.

16 A total of 93.3% more than happy to learn if there is a learning media in the form of software such as Lectora Inspire, especially on the topic of Reduction-Oxidation Reactions.

3.1.2 Result of Teacher Analysis Needs

Teacher needs analysis conducted by distributing questionnaires and interviews with 2 chemistry teacher. Based on interviews and questionnaires of the two teachers, the Reduction-Oxidation Reactions material requires good study techniques such as using the media so that students are more attractive and motivated. In addition, students can understand the concept well in chemistry learning. Both chemistry teacher SMA Negeri 58 Jakarta have never heard media Lectora Inspire. Both the teacher expects a lot of media that uses animation and images are attractive as possible so that learning more fun and interesting chemistry.

3.2 Media Development Phase

Development is done through the implementation of Professional Learning Community (PLC), so the media created was the result of a collaboration of researchers with teachers of various fields in SMAN 58 Jakarta. The development stage is divided into two phases: Phase Design and Development Phase.

3.2.1 Phase Design

In the design stage of learning media, collaboration is made to discuss the problems that generally become an obstacle in learning chemistry, analyze the cause of the problem, find solutions and prepare learning media. Collaboration activity is divided into two parts. Collaboration Event Design I is to determine the place and time collaboration activity that collaboration activities can be run according
to plan. The goal of the collaboration is to produce instructional media Lectora Inspire in accordance with the needs of students so as to increase the motivation of students to learn chemistry.

Collaborative Design Activity II is to make a concept map that will be presented in the media Lectora Inspire. The material will be presented in the media Lectora Inspire accordance with the standards of competence in Curriculum 2013. The collaboration also discussed about the overview and instructional media content Lectora Inspire. Media to be made to the composition of color, typeface and font size which need to be adjusted. This collaboration meeting ended with determining matters pertaining to subsequent collaboration meetings. In the next meeting will begin the development phase Lectora Inspire media.

3.2.2 Developing Phase

The purpose at this stage of development of instructional media is to create and develop Lectora Inspire learning media which have been designed in the design stage. Media development phase consists of five meetings collaborative development. I conducted by the collaboration activity is the selection of source material and summarizing the material and the selection of the pictures that will be presented in Lectora Inspire learning media.

Collaboration activity phase II are the selection of themes and layouts, selection and competency home display, selecting images and animation creation and manufacturing of display material in the previous stage. The phase III collaboration activity continues display the material and makes the display exercises. In the display of questions in Lectora Inspire equipped with feedback where students get the response for their answers. This software can be used independently so that the students can operate independently at home. Once students have worked on 20 questions in Lectora Inspire, the students will get a score.

IV collaboration activity are making the display and discussion of writing and grammar checks by Indonesian teachers. At a meeting of the collaboration phase V was the last meeting where team collaboration checks all results Lectora Inspire instructional media that have been made and make edits if there is an error. After checking and editing errors overall, the media Lectora Inspire is ready for tested to media experts, materials and PBM and testing to students. Here is an excerpt of the media the display Lectora Inspire.

![Home Display](image)

**Figure 1.** Home Display.
3.3 Trial Media Phase

Before media Lectora Inspire is widely used then it should be tested. The purpose of product trials is to gain, corrections, criticisms and suggestions for such products to be fit for use. Experiments performed on media Lectora Inspire, namely the trial to experts, small group test and large groups test.
3.3.1 Trial with Experts

The trial aims to determine the expert opinion of the experts on learning media Lectora Inspire produced and test the feasibility of prior learning media Lectora Inspire is widely used in class. Piloted experts conducted by Lectora Inspire provides instructional media that have been created and a questionnaire containing an assessment of the learning media Lectora Inspire. The results of the expert test will be the input for the improvement of instructional media Lectora Inspire so that used in the classroom. Trials to test the expert covering subject matter experts, media experts test and trial experts of Teaching and Learning.

3.3.1.1 Subject Matter Experts Test

Test the material experts conducted by professors and lecturers of Physical Chemistry Chemical Basic from UNJ and chemistry teacher from SMA Negeri 30 Jakarta. Implementation of the test to the subject matter experts is done by providing instructional media Lectora Inspire and test questionnaires matter experts. The questionnaire for the experts of this material consists of 11 items of questions. Based on the calculation results can be seen that the coefficient of the material inter-rater agreement was 0.70. It can be argued that the concordance between the assessor in assessing the quality of teaching materials is already well grounded by category Fleiss, the result of inter-rater suitability of this it can be concluded that the instructional media Lectora Inspire has decent used.

3.3.1.2 Media Expert Test

Media expert test aims to test the feasibility of a medium of learning in terms of look and find out what media experts about the resulting media. Media expert test conducted by ICT teacher at SMA Negeri 58 Jakarta and SMAN 30 Jakarta and informatics engineering graduates who are experts in instructional media Lectora Inspire. Media experts questionnaire consists of 10 items of questions. Based on the calculation results can be seen that the coefficient of inter-rater agreement of media at 0.79. It can be argued that the concordance between the assessor in assessing the quality of teaching materials have good media by category Fleiss. From the above results it can be concluded that the instructional media Lectora Inspire has decent used from the side views such as layout, color, image and function. Media Lectora Inspire also have struktur and good navigation and easy to understand so as not to complicate the students in the run. In Lectora Inspire instructional media are animated so well that more interesting and less monotonous and can increase the activity of students in accordance with the curriculum of 2013 and students become more motivated to increase.

3.3.1.3 Trial Expert of Teaching and Learning

Test experts Teaching and Learning aims to test the feasibility of a medium of learning in terms of teaching and learning in the classroom and find out what the media presented to the suitability of the learning process in accordance with Curriculum 2013. PBM expert test conducted by chemistry teacher at SMA Negeri 58 Jakarta, SMA 30 Jakarta and SMAN 64 Jakarta. Questionnaires for the PBM consists of 13 experts the questions. Based on the calculation in mind that inter-rater agreement PBM coefficient of 0.81. This may imply that the conformity between valuer to assess the learning process very well by category Fleiss. Based on the analysis of learning objectives learning media Lectora Inspire is in compliance with core competency and basic competency. Description of the material presented is clear and the language used is simple and communicative so as to facilitate the learning process. In addition, Lectora Inspire animation in the media is very helpful in the learning process in addition presented contextual examples and illustrations.

3.4 Small Group Test

Test a small group aims to test the feasibility and determine what students say about Lectora Inspire instructional media which have been developed. Questionnaire test media in small groups consisting from 18 items of questions. Based on the interpretation of the calculation can be seen in the following table:
Table 1. Interpretation Result of Small Group Test.

<table>
<thead>
<tr>
<th>No.</th>
<th>Indicator</th>
<th>Σ</th>
<th>%</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The quality of material relevance to the media Lectora Inspire</td>
<td>205</td>
<td>85,4</td>
<td>Very Good</td>
</tr>
<tr>
<td>2.</td>
<td>Quality Content</td>
<td>573</td>
<td>79,6</td>
<td>Good</td>
</tr>
<tr>
<td>3.</td>
<td>Instruktional Quality</td>
<td>379</td>
<td>78,9</td>
<td>Good</td>
</tr>
<tr>
<td>4.</td>
<td>Technical Quality</td>
<td>549</td>
<td>76,3</td>
<td>Good</td>
</tr>
</tbody>
</table>

The quality of teaching materials is said to be very good if the computed percentage reaches > 80%. Based on calculations for Lectora Inspire indicator of the relevance of media and materials get a very good interpretation while the indicators of quality of content, Instructional and Technical interpretation as well. After knowing the shortage from teaching materials developed and carried out repairs before testing the viability of the large group of students.

3.5 Large Group Test

Large group trial aims to test the feasibility and to hear from students about teaching media Lectora Inspire developed. This large group test conducted to 67 students. Questionnaires trial Lectora Inspire learning media in a large group is comprised of 18 of the questions. The results of the analysis instrument Lectora Inspire media trials on large groups based on the calculation can be seen in table 2 below:

Table 2. Interpretation Result of Large Group Test.

<table>
<thead>
<tr>
<th>No.</th>
<th>Indicator</th>
<th>Σ</th>
<th>%</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The quality of material relevance to the media Lectora Inspire</td>
<td>447</td>
<td>83,3</td>
<td>Very Good</td>
</tr>
<tr>
<td>2.</td>
<td>Quality Content</td>
<td>1312</td>
<td>81,6</td>
<td>Very Good</td>
</tr>
<tr>
<td>3.</td>
<td>Instruktional Quality</td>
<td>856</td>
<td>79,8</td>
<td>Good</td>
</tr>
<tr>
<td>4.</td>
<td>Technical Quality</td>
<td>1337</td>
<td>83,1</td>
<td>Very Good</td>
</tr>
</tbody>
</table>

The quality of teaching materials is said to be very good if the computed percentage reaches > 80%. Based on calculations for Lectora Inspire indicator of the relevance of media and materials, Quality Content and Technical interpretation as very good while the quality indicators Instrusional interpretation as well.

Based on the results of the feasibility to the students try small groups and large groups can be concluded that the quality of teaching materials in the form of instructional media Lectora Inspire Reduction-Oxidation Reaction material is sound and fit for use by teachers in teaching and learning process.

4 CONCLUSIONS

Based on this research can be concluded that the development of instructional media Lectora Inspire chemistry developed through the implementation of Professional Learning Community at the material Reduction-Oxidation Reactions otherwise good and feasible for use in learning chemistry on the Curriculum 2013. Lectora Inspire media display is very attractive and is equipped with animation in accordance with the needs of students based on a needs analysis questionnaire. Lectora Inspire instructional media material presented with contextual and implement a scientific approach that can improve students' activity. This is in accordance with the chemistry learning using the curriculum of 2013. At the end of the section and is also equipped with a competency test and exercises to measure students' skills in mastering the material.

The results of this study indicate that through the implementation of Professional Learning Community can develop learning media well. It is proven and the achievement of the indicators of media, the coefficient of inter-rater agreement is quite good, and the interpretation of high value. Professional Learning Community is also very beneficial for the members for the collaboration to develop computer-based product that can be used in learning and teaching process.
Based on the research, development of instructional media chemistry on the topic Reaction Reduction-Oxidation through the implementation of Professional Learning Community based curriculum 2013 can improve the ease of the students in learning the material because the media presented more interesting and interactive as well as assisting teachers in teaching because the media play a role as well as teaching materials alternative teaching for teachers.

ACKNOWLEDGEMENTS
This research report was made possible through funding received from the Directorate Research Ministry of Research, Technology, and Higher Education. The authors would like to thank colleagues, Research Institution and Department of Chemistry Education State University of Jakarta.

REFERENCES
THE DEVELOPMENT OF LECTORA INSPIRE MEDIA WITH SCIENTIFIC BASED APPROACH FOR TEACHING REDUCTION-OXIDATION REACTION THROUGH PROFESSIONAL LEARNING COMMUNITY

Ucu Cahyana

This is to certify that: has presented the paper entitled:

ICERI2016 - INTERNATIONAL CONFERENCE OF EDUCATION, RESEARCH AND INNOVATION

14th-16th November 2016 Seville - Spain

ICERI2016 Organizing Committee
14/11/2016