PENGEMBANGAN *E-COMIC* PEMBELAJARAN BERBASIS *CONTEXTUAL TEACHING AND LEARNING* DALAM PEMBELAJARAN MATEMATIKA MATERI ARITMETIKA SOSIAL KELAS VII SMP

JURNAL

Diajukan kepada Fakultas Matematika dan Ilmu Pengetahuan Alam
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PROGRAM STUDI PENDIDIKAN MATEMATIKA FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
UNIVERSITAS NEGERI YOGYAKARTA

PENGEMBANGAN *E-COMIC* PEMBELAJARAN BERBASIS *CONTEXTUAL TEACHING AND LEARNING* DALAM PEMBELAJARAN MATEMATIKA MATERI ARITMETIKA SOSIAL KELAS VII SMP

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ABSTRAK

Penelitian ini bertujuan untuk mengembangkan *e-comic* pembelajaran berbasis *Contextual Teaching and Learning* (CTL) dalam pembelajaran matematika materi aritmetika sosial kelas VII SMP serta mengetahui kualitas produk ditinjau dari aspek kevalidan, kepraktisan, dan keefektifan. Pengembangan produk mengacu pada model pengembangan ADDIE yaitu analisis (*analysis*), pendesainan (*design*), pengembangan (*development*), pengimplementasian (*implementation*), dan evaluasi (*evaluation*). Uji coba dilakukan kepada 32 orang peserta didik kelas VII-8 di SMP N 8 Yogyakarta. Instrumen yang digunakan untuk mengukur kualitas *e-comic* meliputi lembar penilaian media *e-comic* untuk ahli materi dan media, lembar penilaian RPP, angket respon pengguna (peserta didik dan guru), dan tes hasil belajar. Kualitas *e-comic* pembelajaran ditinjau dari aspek kevalidan memiliki kriteria very good, berdasarkan data bahwa kualitas media e-comic memperoleh skor rata-rata 8,23 dan kualitas RPP memperoleh skor rata-rata 8,32. Aspek kepraktisan mencapai kriteria good, berdasarkan angket respon peserta didik memperoleh skor rata-rata 4,00 dan angket respon guru memperoleh skor rata-rata 4,09. Aspek keefektifan memiliki kriteria very good dengan persentase ketuntasan peserta didik dari tes hasil belajar sebesar 87,50%.

Kata kunci: *e-comic* pembelajaran, CTL, aritmetika sosial

DEVELOPING CONTEXTUAL TEACHING AND LEARNING-BASED LEARNING E-COMIC ON SOCIAL ARITHMETIC MATERIALS FOR JUNIOR HIGH SCHOOL GRADE VII

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Abstract
This research was aimed to develop e-comic learning based on Contextual Teaching and Learning (CTL) on mathematics learning arithmetic socials materials for junior high school grade VII, and to evaluate the products quality in terms of their validity, practicality, and effectiveness. This was a developmental research based on ADDIE model consisting of analysis, design, development, implementation, and evaluation. The developed were tried out to 32 students of grade VII-8 at SMP N 8 Yogyakarta. The instrument that used to evaluate the e-comic qualities consisted of e-comic assessment sheet for material and media experts, lesson plan assessment sheet, response questionnaire (for students and teacher), and student achievement test. The quality of e-comic learning in terms of validity was very good, according to the collected data that the e-comic obtained average score 8,23 and lesson plan obtained average score 8,32. In terms of practicality, they were good, according to the student response to the questionnaire obtained average score 4,00 and the teacher response to the questionnaire obtained average score 4,09. In terms of effectiveness, they were very good, according to the student achievement test, which was at percentage level 87,50%.

Keywords: e-comic learning, CTL, arithmetic socials

INTRODUCTION

Learning media is one of important component in learning activity. Election and utilization of learning media appropriate subject matter. One of subject matter is mathematics. According to Suparwoto (2007: 36), one of the success in learning depend on utilization learning resources or media that can be used in learning activity. There are many kinds of learnig media that is used in learning activity. One of learning media that can be used is learning e-comic.

According to Indonesian language, the meaning of comic is funny (M.S. Gumelar, 2011: 1). In a row of its development, the appearance of comic was not only on comic strip form but more flexible with many size appropriate to necessity and it's not only on funny theme but there are various themes.

Comic previously made specifically for jokes and audience segmentation only children begin to transform into reading with segmentation readers are teenagers and adults. This is evidenced by observations of 32 students at SMPN 8 Yogyakarta as many as 26 people learners like comics with various themes.

According to M.S.Gumelar (2011: 7), comic is sequences of images arranged appropriate the objectives and philosophy of the author to the message delivered stories, comics tend to be given the necessary lettering as needed. Based on these definitions it is clear that the medium of comics varied not only in the form of paper or books. Comics can be

served traditionally or electronically. Comic presented electronically called digital or electronic comics comic (e-comic). E-comic is a comic technological transformation in the media that was originally in the form of printing transformed into electronic format (Rahardjo, 2002: 7). One of the electronic media that can be used to operate an e-comic is a laptop.

The increase in the number of users of electronic equipment such as laptops continue to grow as an increasing number of users of electronic equipment such as laptops continues to grow in line with technological developments. Various types, brands, and laptop specs also appear along with the development needs of electronic tools. Based on observation of 32 students at SMPN 8 Yogyakarta, all students use a laptop for school assignments with minimal operating system used is Windows 7. The laptop used by learners as a tool to support learning activities. This is in accordance with the principle of learning curriculum in 2013 about the use of technology in the learning set out in the Permendikbud RI No. 65 about Standard Process mentioning that in 2013 the role of technology was increasing the independence of learners in acquiring knowledge.

E-comic as learning media which operated use laptop to support learning principle on the curriculum 2013. The different between e-comic and the ordinary comic is the appearance. The story plot based on contextual daily life which connected to subject matter. Social arithmetic was one of the subject matter which proper to the e-comic story, because its applications familiar to the daily life.

In addition, learning approach is the important thing in lesson plan to achieve the learning objectives. According to Percival and Henry on Milan (2006: 4), in learning activity consisted of two kind of learning approach, that is student centered approach and teacher centered approach. Contextual Teaching and Learning (CTL) is one of student centered approach. According to Texas Collaborative for Teaching Excellence on Nurhadi (2003: 4), learning with CTL involved seven component which included on approach contextual strategy is REACT (relating, experiencing, applying, cooperating, and transferring).

Based on those issues, researcher want to try developing Contextual Teaching and Learning (CTL) based-learning e-comic on social arithmetic for junior high school grade VII.

This research was aimed to develop e-comic learning based on Contextual Teaching and Learning (CTL) on mathematics learning arithmetic socials materials for junior high school grade VII, and to evaluate the products quality in terms of their validity, practicality, and effectiveness.

The benefits of this research consisted of increasing the comprehension and application of the social arithmetic concept, increasing the professionally and confidency of teachers, giving motivation for teachers, perception, and scientific thinking.

RESEARCH METHODS

The developmental e-comic media used developmental reserach methods, that was,

reserach methods that used to obtain certain products and to examine products effectiveness (Sugiyono, 2010: 407). This developmental reserach used ADDIE (Analysis, Design, Development, Implementation, Evaluation) model that was developed by Dick and Carry for planning the learning systems (Endang Mulyaningsih, 2012: 200).

This research held during April until May 2015 at SMP N 8 Yogyakarta grade VII-8. This reserach subjects were 32 students in grade VII-8.

First step of ADDIE model was analysis step. This step consisted of needed analysis, junior high school grade VII mathematics curriculum analysis, learning analysis using learning media based on computer, learning analysis based on CTL, students characteristic analysis, school analysis, and technology analysis.

The analysis result used as the basis to design the learning e-comic media. Design step consisted of material and exercise design, story tittle determination, figure characteristics determination, e-comic scenario design, tools and materials preparation, and e-comic assessment instrument.

Develop step consisted of figure production, e-comic production, e-comic design, and lesson plans production. Validation was held by material and media expert. After that, revised the products until learning materials feasible to be used in class matematics learning.

Implementation step, was held at SMP Negeri 8 Yogyakarta grade VII, consisted of learning e-comic media implementation, students achievement test, response questionnaires fulfilment, and data analysis.

Evaluation step was held to evaluate lesson plans and e-comic quality based on validity, practicality, and effectiveness. This step consisted of revised to learning materials based on suggestions and comments from the teacher and students response questionnaires.

There were qualitative data and quantitative data. Qualitative data was obtained by the validity result of media and material expert and the teacher and students response questionnaires such as suggestions and comments. Quantitative data was obtained by the media validity result, the teacher and students response questionnaires to developmental media, and the students achievement test result.

The instruments used on this research was assessment sheet of e-comic for media and material expert, assessment sheet of lesson plans, teacher and students response questionnaires, and students achievement test.

The data was proper to the criteria and analyzed descriptively. The data of media validity result by material and media expert, teacher and students response questionnaires result, and students achievement test result, was analyzed to evaluate the media quality based on validity, praticality, and effectiveness steps.

The assessment sheets were given to a material expert and a media expert. It had rating scale consisted of ten categories. The teacher and students response questionnaires had rating scale consisted of five categories. The student

achievement tests were designed according to the basic competencies and indicators that have been determined.

The validity and practicality were assessed by analyzing several steps such as data tabulation, calculate the average score, and convert the average score into qualitative criteria based on Table 1.

Table 1. Quality Assessment Criteria of Lesson Plan and E-comic Media

Average Score Interval	Criteria
$\bar{X}_i + 1.8 \times sb_i < \bar{X}$	Very Good
$\bar{X}_i + 0.6 \times sb_i < \bar{X} \leq \bar{X}_i + 1.8 \times sb_i$	Good
$\bar{X}_i - 0.6 \times sb_i < \bar{X} \leq \bar{X}_i + 0.6 \times sb_i$	Enough
$\bar{X}_i - 1.8 \times sb_i < \bar{X} \leq \bar{X}_i - 0.6 \times sb_i$	Less
$\bar{X} \leq \bar{X}_i - 1.8 \times sb_i$	Very Less

Information:

$\bar{X}_i$ = Ideal average = $\frac{1}{2}$(maximum ideal score + minimum ideal score)

sb_i = Ideal standar deviation = $\frac{1}{6}$(maximum ideal score − minimum ideal score)

$\bar{X}$ = Average score

According to Table 1, it could be determined the interval of the assessment of learning e-comic. The interval was shown in Table 2.

The developed learning e-comic would fulfill validity and practicality if they achieved the minimum criteria, which was good.

Table 2. Guidelines Conversion Of The Average Score for Each Into Qualitative Data

Average Score Interval	Criteria
$8{,}20 < \bar{X}$	Very Good
$6{,}40 < \bar{X} \leq 8{,}20$	Good
$4{,}60 < \bar{X} \leq 6{,}40$	Enough
$2{,}80 < \bar{X} \leq 4{,}60$	Less
$\bar{X} \leq 2{,}80$	Very Less

The developmental e-comic and lesson plans will valid if the validity result of e-comic media and lesson plan were categorized at least good and feasible to be impelemented. Assessment sheet data such as sugesstion and comments used as basis to revised the developed products.

The practicality products can be shown by analysis result of teacher and students response questionnaires using assessment guidelines on Table 3.

Table 3. Assessment Guidelines of Response Questionnaire for Positive and Negative Statements

Optional Answer for Positive Statements	Optional Answer for Negative Statements	Score
Very Approve	Very Not Approve	5
Approve	Not Approve	4
Approve Enough	Approve Enough	3
Not Approve	Approve	2
Very Not Approve	Very Approve	1

Convert the average score obtained into qualitative based assessment criteria scale 5. Guidelines conversion can be seen in Table 4.

Tabel 4. Guidelines Conversion Of The Average Score for Each Aspects on Students Response Questionnaire Into Qualitative Data

Average Score Interval	Classification
$4{,}20 < \bar{X}$	Very Good
$3{,}40 < \bar{X} < 4{,}20$	Good
$2{,}60 < \bar{X} < 3{,}40$	Enough
$1{,}80 < \bar{X} < 2{,}60$	Less
$\bar{X} \leq 1{,}60$	Very Less

The learning e-comic was practice if the average score obtained from students response questionnaire categorized good.

The effectiveness analysis can be shown by analysis result of students achievement. The compeletness precentage of students was categorized by academic achivement in Table 5.

Table 5. Assessment Criteria of Academic Achievement

Completeness precentage	Category
$80 < K$	Very effective
$60 < K \leq 80$	Effective
$40 < K \leq 60$	Effective enough
$20 < K \leq 40$	Less effective
$K \leq 20$	Not effective

Information : K = completeness precentage

The developed product was effective if the completeness precentage minimum obtained effective.

FINDING AND DISCUSSION

The validity analysis consist of e-comic learning and lesson plans to guide the learning activities. The result is shown in Table 6 and Table 6 below.

Table 6. The Validity Result of Learning E-comic

Aspects	Average	Criteria
Compatibility of e-comic with CTL	8,30	Very good
Quality of material content and the objective of learning e-comic	8,20	Good
Instructional quality of learning e-comic	8,40	Very good
Technic quality	8,04	Good
Average	**8,23**	**Very good**

According to Table 6 the quality of developed learning e-comic in terms of validity was very good, according to the collected data that the learning e-comic media obtained average score 8,23 of maximum score 10. Thus, CTL based-learning e-comic were very valid.

Table 7. The Validity Result of Lesson Plan

Aspects	Average	Criteria
Identity	9,00	Very good
Indicators and learning objectives	8,60	Very good
Election material	8,40	Very good
Election learning approach	8,14	Good
Learning activities with CTL approach	8,09	Good
Election learning resources	8,00	Good
Learning achieve assessment	8,20	Good
Average	**8,32**	**Very good**

According to Table 7 the quality of developed learning e-comic in terms of validity was very good, according to the collected data that the lesson plan obtained average score 8,32 of maximum score 10. Thus, the lesson plan were very valid.

The practicality of learning e-comic were evaluated from the result of user response questionnaires in Table 8 and Table 9.

Tabel 8. The Practicality Result of Student Response Questionnaires

Aspects	Average	Criteria
Easiness	3,84	Good
Helpedness	4,06	Good
Anxiety	4,24	Very good
Being active	3,98	Good
Happiness	4,23	Very good
Media appearance	3,88	Good
Average	**4,00**	**Good**

According to Table 8 the quality of developed learning e-comic in terms of

practicality was good, according to the collected data that the learning e-comic media obtained average score 4,00 of maximum score 5. Thus, the learning e-comic media were practice in the learning process.

Tabel 9. The Practicality Result of Teacher Response Questionnaires

Aspect	Average	Criteria
Easiness	3,67	Good
Helpedness	4,00	Good
Anxiety	4,00	Good
Being active	4,33	Very good
Happiness	4,00	Good
Media appearance	4,29	Very good
Rata-rata	**4,09**	**Good**

According to Table 9 the quality of developed learning e-comic in terms of practicality was good, according to the collected data that the learning e-comic media obtained average score 4,09 of maximum score 5. Thus, the learning e-comic media were practice in the learning process.

The effectiveness were assessed by analyzing the results of the student achievement test as shown in Table 9 below.

Tabel 10. The Effectiveness Result of Student Achievement Test

The amount od students	32
The amount of complete students	28
The amount of incomplete students	4
Completeness precentages	87,50%
Incompleteness precentages	12,50%

According to Table 10, student achievement test results obtained the completeness precentage level 87,50% with the amount of 28. According to these results, the learning materials were effective to be used.

Conclution and Recommendation

Conclusion

The quality of developed learning e-comic in terms of validity was **very good**, according to the collected data that the learning e-comic obtained average score 8,23 and lesson plan obtained average score 8,32 of maximum score 10. In terms of practicality, they were **good**, according to the student response to the questionnaire having average score 4,00 and teacher response to the questionnaire having average score 4,09 of maximum score 4. In terms of effectiveness, they were **very good**, according to the student achievement test, which was at precentage level 87,50%. These data showed that CTL based-learning e-comic can be used in grade VII students or other students with similar characteristics.

Recommendation

The developed learning materials were expected to be used in schools that have the same characteristics of the research students. The development of learning materials with the other subject matters and learning approaches could be implementation appropriately with similar procedure in this research.

DAFTAR PUSTAKA

Endang Mulyatiningsih. Tt. *Pengembangan Model Pembelajaran*. (http://staff.uny.ac.id/sites/default/files/pengabdian/dra-endang-mulyatiningsihmpd/7cpengembangan-model-pembelajaran.pdf), diunduh 19 April 2014.

MS Gumelar. 2011. *Comic Making*. Jakarta Barat: PT Indeks.

Nurhadi. 2003. *Pendekatan Kontekstual*. Jakarta : Departemen Pendidikan Nasional.

Sugiyono. 2010. *Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.

Suparwoto. 2007. *Dasar-dasar dan Proses Pembelajaran Fisika*. Yogyakarta: FMIPA UNY.