International Journal of Educational Review

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Content

IDENTIFICATION OF STUDENTS KNOWLEDGE ON LOCAL GAMES AS A BASIS TO DEVELOP ELEMENTARY SCHOOL SCIENCE TEXTBOOK

Riyanto[1], Diyah Aryulina[2], Suwarsono[3]

[1,2,3]Universitas Bengkulu

e-mail: riyanto_unib@yahoo.com

Abstract: The purpose of this study was to identify student knowledge on local games as a basis to develop science elementary school science textbook containing life skills and local games. Descriptive method with questionnaire as an instrument was used to conduct the study on 2160 elementary school students in Bengkulu Province. The results of the study showed that students' knowledge related to local games was generally categorized as fair. Student knowledge related to knowledge on traditional games was quite various. Based on the study, the local games to be included in the development of elementary school science textbook were reviewed again. Local games known by most students are used as a basis to begin each chapter or subchapter of the textbook, whereas learning sources known by more than 80% students were implemented as chapter themes.

Keywords: Local Games; Elementary School Science; Textbook

1. Introduction

The development of this elementary school science textbook containing life skills and local games (LSLG) is conducted to support KTSP implementation for students to have life skills which are needed for them to be able to adapt to the science and technology oriented world. According to Buchori (2001) and Cahyana (1998), to develop Indonesia human resources who are excel in science, qualified science and math education is needed on elementary, secondary, and higher education. Current reality shows that the overall science education quality is needed to be improved. This condition is shown by student achievement in science. Based on TIMSS-R of the year 2003, the ability of Indonesia students in science and mathematics is not satisfied yet (NCES, 2004). Science student achievement in Bengkulu elementary school is also not too good with score average on national examination is 6.10 (Dinas Diknas Provinsi Bengkulu, 2008).

Low quality of science education in Indonesia is caused by several factors. Several studies cited by Cahyana (1998) showed that those factors are: 1) lack of motivation in students for studying science and mathematics, 2) lack of basic understanding in students on science and mathematics concepts, 3) inadequate teacher qualification, educational background, and teaching experience, and 4) too much and too high learning materials presented compare to teacher ability, student preparedness, and learning facilities. Moreover, low science education quality is also caused by the present curriculum in which its development is not connected to real life (Buchori, 2001). Ideally, curriculum should be life-oriented and able to provide ability needed by students for life. This ability is called life skills.

In an effort to improve science education quality that has relevancy to era development and student need in the future, government develop improved science curriculum called KTSP. Science in KTSP is developed to materialize science education vision to prepare science and technology literate students to understand themselves and their environment through the development of process skills, science attitude, thinking skills, understanding

essential science concept and technology activity, and an effort to manage environment wisely and for growing gloryfication attitude to God (Depdiknas, 2006). Skills, attitude, horizon, and understanding in science are science competencies needed to be developed with other competencies as capital for students in facing life challenges in the future independently, smart, criticcsm, rationally, and creatively. Life skills-oriented KTSP is able to improve student creativity in science and cooperation among student.

To implement KTSP in class, textbook is needed because it is referred by teacher in teaching and learning process. This textbook has to be design in a way which be able to make students more independent in learning, collaborate, helping friends, conducting observation, problem solving, and evaluating themselves for reflection. Therefore, it can encourage them to construct their own knowledge fast. Therefore, new vision can be gained though direct experience with more effective. However, available textbook in the market are considered lack of quality by society. This condition is shown in the form of appropriate lackness textbook content with learning goals for certain age and group of students in certain region (Sumardi, 2002), also to curriculum and science knowledge (Buchori, 2001). That textbook quality influence student learning achievement. Based on filed observation and discussion with several elementary school teachers in Bengkulu, those kind of textbook are used as reference by teachers and students. Several reasons to use the book are economic factor, ability, and time limitation of teacher. According to Cunningsworth, textbook is an important component in determining student learning achievement because textbook is a helper for teachers in conducting teaching and learning activity (Sumardi, 2002). However, to insist guru work alone in writing the book appropriate to the curriculum is unwise since it is not

the main responsibility of teachers. Moreover related to the fast development of science and technology, therefore textbook that can develop creative behavior and cooperative ability is needed. It is hipotezised that elementary school science textbook with containing LSLG can develop those skills since the book is developed by integrating life skills elements and science matters with local games. Integration of life skills elements and local games in textbook, including science textbook, is strategic because not needed to add course and time for learning.

Riyanto, Aryulina, and Suwarsono (2006) already developed elementary school science textbook containing life skills which already tried out. Based on the tryout result, several weakness were found, some of them are lack of examples on local games therefore students are not feel that science is part of their daily life. As a result, the output is not maximal in develop student adaptability. The team also faced difficulty in measuring student adaptability. Therefore, the research should be continued and improved. Improvement conducted by integrating element of local games in elementary school science textbook containing life skills. Games can increase learning result (Heinich, Molenda, and Russel, 1993; Sapari, 2000; and Rieber, 1996), increase student interest (Randel et al., 1992 and Rieber, 1996), increase student creativity (Kompas, March 2008), and increase student social-emotion (Elias et al., 1997). Local games can make learning more meaningful. Learning can be more meaningful if students can relate new knowledge to their prior knowledge. Research conducted by Aryulina, Riyanto, and Karyadi (2002) showed that student prior knowledge can help student understand new concept. Riyanto's research (1999) showed that student learning achievement using cooperative method was better than that using individual learning. Based on those researches, the LSLG

science textbook is predicted can increase students' creativity and cooperative ability. The two variables are important for students to be able to face the future, an era with more complexes problematic that cannot be solved individually.

Improvement in science education process according to Buchori (2000) needs to be conducted by designing instruction with methods that can be understood by every student and does not make students frightened. Science education which does not make student frightened means the education needs to integrate instructional method that stimulate student learning interest. To stimulate student learning interest, instruction should include fun element or enjoyment, especially in this competitive era which can produce stress in students. Fun instruction involves playing element. According to Karaliotas (1999), children and adults tend to react positively to playing. Playing especially is needed in beginning class of elementary school instruction because it is suitable to student characteristic (Harlen, 1992; Sapari, 2000). Beside fun element, prior knowledge is also important in science learning (Piaget, 1967).

Playing is a natural and important component in children learning process. Therefore, playing should be integrated with learning goals (Karaliotas, 1999). Lack of playing can hinder children cognitive and creative growth. Piaget (1967) considered playing as manifestation of assimilation, an important mental process for intellectual growth. Playing can also stimulate cultural development in children because children acquire motivation, skills, and attitude needed for social participation (Elias, et al., 1997 and Kraliotas, 1999). These social processes according to Vygotsky enable children learn language which in turn enables thinking to occur and behavior formation. Social behavior such as justice, cooperation, and conflict management need to be exercised in students as early as possible (Kompas, 9 Desember, 2000).

An effort to improve science education in elementary school is by integrating playing element that can develop interest with creative thinking skills and student cooperative ability. One form of playing is games. Games are activity in which players play by following assigned rules that are different to reality to reach goals of the game (Heinich, Molenda, and Russel, 1993). This difference between games and daily reality makes game entertaining. According to Heinich, Molenda, and Russel (1993), application of games in learning is very appropriate to support achievement of cognitive goals in learning language, arithmetic, and science. Moreover it can increase student interest because games are fun activities. Sapari (2000) and Rieber (1996) describing researches about fun learning revealed the increase of student learning achievement. Relax and fun playing condition especially productive for low achievement students who experience difficulty from structured learning activity (Heinich, Molenda, and Russel, 1993). The use of games in mathematics learning results in higher student learning achievement compared to conventional instructional (Randel, 1992). The use of games also stimulates learning interest (Randel, 1992 and Rieber, 1996) and develops social and emotional intelligence (Elias et al., 1997).

The goal of games usually involves competition. Competition can be individual person to the others, group to group, or individuals to standard. For games to be challenging, the goals must have probability achievement in around 50%. Games in which the result can be predicted either always be achieved or never been achieved are not challenging to the players. Generally, people show interest and motivation if the challenges in moderate range. To reach the goals, games are not always in the form competition but can be cooperative (Heinich, Molenda, and Russel, 1993).

Based on the above description, it can be concluded that good science learning involves playing element. Good games are games known by students. Therefore, this paper focuses on identification of student knowledge on local games as materials to develop elementary school science textbook containing LSLG. This research is part of the study which aimed to produce elementary school science textbook containing LSLG that make learning easier, interesting, challenging, and developing cooperative attitude and creativity for elementary school students. Therefore the students can have learning interest, creativity in science, and cooperative skills. In this way, science understanding target and cooperative skills can be achieved. If most people understand science and able to work cooperatively, Indonesia will be able to compete with other nations because science is the foundation of technology development.

2. Research Method

Descriptive method using survey (Gay, 1992) was conducted to identify student knowledge on local games. The student population was all elementary school students in Bengkulu Province which are consisted of 9 districts. Samples were drawn by purposive random sampling technique. The sample of this study was students of elementary school in six districts which were 346 students of Bengkulu City, 271 student of North Bengkulu, 315 students of Kepahiang, 323 students of Rejang Lebong, 233 students of Seluma, 355 students of Kaur. In each district three school were chosen based on the data of science national examination result (Diknas Propinsi Bengkulu, 2008) represented school in good categorize (652 students), fair categorize (636 students), and poor categorize (555 students). In each chosen school, students of one class of IV, V, and VI grade were chosen. The overall sample is 1843 students who are consisted of 595 students of IV grade, 622 students of V

grade, and 626 students of VI grade from18 elementary schools.

The instrument to identify student knowledge on local games was questionnaire. Local games identified were games in students environment known or ever be played and related to science lesson. Questionnaire was developed based on analysis of local games in students' environment and also specific characters of local region and national. The questionnaire is same for all students. The questionnaire is in the form of list of selection. The study resulted on types of local and national games known by students.

Data of student knowledge on local and national games are grouped according to two categories, good (≥80%) and not good (<20%). This data of student knowledge categories was analyzed descriptively with percentage. The result of analysis on student knowledge on local games was used as part of developing the elementary school science textbook LSLG.

3. Result and Discussion

Identified local games were divided into two groups, native local games of Bengkulu and nonnative local games of Bengkulu. There were 20 native local games of Bengkulu, and 30 nonnative local games of Bengkulu. Students knowledge on types of local games in their environment was quite various as shown in the following table.

Table 1. Bengkulu students' knowledge on local games

Category / Local Games	Ever been played		Know		Don't know		Unfilled	
	f	%	f	%	f	%	f	%
Ayam-ayam Daun Jarak	205	11.1	71	3.9	1490	80.8	77	4.2
Sesiku	67	3.6	58	3.1	1628	88.3	90	4.9
Cici Gandung	31	1.7	31	1.7	1673	90.8	108	5.9
Bedil Ayo	309	16.8	120	6.5	1309	71.0	105	5.7
Main Tali	1386	75.2	266	14.4	177	9.5	14	0.8
Boye-Boye	58	3.1	46	2.5	1641	89	98	5.3
Serebut benteng	445	24.1	162	8.8	1160	62.9	75	4.1
Genuk-genukan	61	3.3	36	2	1633	88.6	113	6.1
Hitam-Hijau	364	19.8	141	7.7	1248	67.7	90	4.9
Batu Limo	353	19.2	105	5.7	1303	70.7	82	4.4
Ding Dingan	89	4.8	74	4	1570	85.2	110	6
Imbo Kambing	74	4	71	3.9	1594	86.5	104	5.6
Suruk Anak	625	33.9	161	8.7	1006	54.6	51	2.8
Seka Keak	39	2.1	37	2	1659	90	108	5.9
Belacik	175	9.5	58	3.1	1511	82	99	5.4
Teng Bukuk	308	16.7	77	4.2	1369	74.3	89	4.8
Ninik	108	5.9	80	4.3	1552	84.2	103	5.6
Bebaling jung	87	4.7	52	2.8	1595	86.5	109	5.9
Badung	118	6.4	100	5.4	1512	82	113	6.1
Yoyo	1396	75.7	257	13.9	173	9.4	17	0.9
Gasing	1473	79.9	273	14.8	81	4.4	16	0.9
Ketapel	1115	60.5	297	16.1	410	22.2	21	1.1
Ayunan	1598	86.7	179	9.7	58	3.1	8	0.4
Jungkat jungkit	1313	71.2	216	11.7	291	15.8	23	1.2
Tak Benteng	265	14.4	99	5.4	1369	74.3	110	6

Gobak Sodor	276	15	124	6.7	1322	71.7	121	6.6
Ular naga	878	47.6	239	13	663	36	63	3.4
Luncuran	1159	62	238	12.9	408	22.1	38	2.1
Dakon/Congklak	1063	57.7	168	9.1	571	31	41	2.2
Egrang	269	14.6	258	14	1229	66.7	87	4.7
Sunda Manda	80	4.3	58	3.1	1580	85.7	125	6.6
Petak Umpet	1489	80.8	150	8.1	175	9.5	29	1.6
Panahan	738	40	332	18	687	37.3	86	4.7
Layang-layang	1465	79.5	292	15.8	65	3.5	21	1.1
Kereta Dorong	663	36	329	17.9	771	41.8	80	4.3
Ular Tangga	1534	83.2	178	9.7	113	6.1	18	1
Monopoli	1214	65.9	200	10.9	390	21.2	39	2.1
Cangkulan	537	29.1	222	12	1020	55.3	64	3.5
Kwartet	98	5.3	97	5.3	1517	82.3	131	7.1
Seruling	1270	68.9	403	21.9	134	7.3	36	2
Peluit	1449	78.6	234	12.7	116	6.3	44	2.4
Otok-otok	90	4.9	85	4.6	1523	82.6	145	7.9
Bentik/Patel lele	227	12.3	103	5.6	1385	75.1	128	6.9
Gundu/Kelereng	1355	73.5	241	13.1	200	10	47	2.6
Lompat-lompat dengan tali	1420	77	268	14.5	127	6.9	28	1.5
Gendang	996	54	532	28.9	266	14.4	49	2.7
Dol	287	15.6	374	20.3	1076	58.4	106	5.8
Angklung	424	23	648	35.2	686	37.2	85	4.6
Kolintang	175	9.5	469	25.4	1068	57.9	131	7.1
Balon dari gelembung sabun	1515	82.2	176	9.5	119	6.5	33	1.8

Based on the table, from 20 native local games of Bengkulu only the game of rope playing (*main tali*) which ever been played by 65% students, whereas 25%

students know it. Other 19 games (*ayam-ayam daun jarak, sesiku, cici gandung, teng bukuk, ninik, bebaling jung, badung, bedil ayo, seka keak, belacik, boye-boye, serabut benteng, genuk-genukan, hitam-hijau, batu limo, ding-dingan, imbo kambing, dan suruk anak*) have ever been played only by 5% to 20% students.

Only 16 from 30 nonnative local games of Bengkulu were known by more than 80% students. The games were *tak benteng, luncuran, petak umpet, layang-layang, ular tangga, monopoli, ayunan, yoyo, gasing, gundu/kelererng, jungkat-jungkit, seruling, peluit, lompat tali, gendang, and balon gelembung sabun*. Other 14 games were known by less than 80% students. The games were *ketapel, gobak sodor, ular naga, sunda manda, dakon, egrang, panahan, kereta dorong, cangkulan, kwartet, otok-otok, angklung, kulintang, and patel lele*.

The few native local games of Bengkulu known by students shows that the games already were pushed aside by local games from outside Bengkulu. This condition occurred because most of Bengkulu resident were nonnative whether as transmigrates or as emigrants.

Local games explored from students were shown on certain section of the developed textbook. Local games were applied as themes for every section and chapter of the book. The theme selection was based on relatedness criteria and familiarity level of local games by students. The relatedness of local games means that selected local games were related to main lesson in each section and each chapter of the textbook. The level of familiarity of local games is the number of students who know or ever play the games. The use of themes which were known by students in the beginning of learning process can help students relate what they already know to what will be learned. Therefore student learning process becomes more meaningful Sunal and Sunal, 2002).

Local games selected as themes are the games known or ever been played by more than 80% students. Those local games were presented as unifying topic in each textbook section and chapter as suggested by Czerniak, Weber, Sandman Jr, and Ahern (1999). Every book section begins with theme figure and its narration. Sections of the book can be consisted of one chapter or more. The theme of chapters is adjusted to the section theme. Each chapter also begins with picture and picture narration as introduction. For example, on the textbook of fourth grade, local games which were selected as theme of textbook section and chapter are *sepak bola, jungkat-jungkit, ketapel, ayunan,* and *gasing*.

Presentation of lesson explanation follows inductive pattern (Collete and Chiapetta, 1994) that is explanation begins with examples or phenomena on theme and prior knowledge learned before. New knowledge is developed based on learned knowledge, either through recalling previous lesson or through direct activity.

4. Conclusion

Based on the research result and discussion, the conclusions are students' knowledge on local games was various. Certain types of local games were known by most students. Student knowledge on local games is used as materials in new lesson explanation in the elementary school science textbook. Local games become themes or integrated topics in every book section and chapter.

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