Application of *simpang tegar* method: Using data comparison

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Abstract---This study was intended to improve the teacher's understanding and skills in HOTS and USBN questions preparation. To achieve the goal, *Simpang Tegar* (socialization and integrated assistance) method was implemented. The research was action research conducted SMAN 1 Selemadeg and SMAN 1 Kerambitan. The research subjects were 124 teachers. The research object was the teacher's understanding and skills. Data was on teacher's understanding regarded HOTS and USBN questions preparation. It was collected using conducted tests before and after. The action was given on socialization. Data on teacher's skill to compile HOTS and USBN questions was collected using observation techniques before and after being given integrated assistance measures. The obtained data were analyzed descriptively quantitative. The results of the data analysis show: (1) teacher's understanding owns an average of 55.67 increased to 73.12. (2) the teacher's skill the compiled questions before being given integrated assistance with an average of 44.73 increasing to 67.74; and (3) the integrated mentoring was able to optimize the understanding of concepts and skills on developing HOTS and USBN problems through MGMP internal discussions. It can be therefore concluded *Simpang Tegar* method was to improve teacher's understanding and skills on HOTS and USBN questions preparation.
Keywords---*technique, question, socialization, observation, integrated*

Introduction

National Exam/*Ujian Nasional (UN)* is an activity to measure graduates competency achievement in certain subjects. It is nationally referring to Graduate Competency Standard. National Standardized School Examination/*Ujian Sekolah Berstandar Nasional (USBN)* is an activity of measuring student competency performance conducted. It is for all subjects with reference to Graduate Competency Standard. In order to gain recognition for learning achievement, except for local wisdom subjects (Badan Standar Nasional Pendidikan, 2017).

UN is no longer a determinant since the academic year 2014/2015. The student graduation is on primary and secondary education level (Permendikbud No. 5, 2015). The implication is USBN mastering a very strategic function. It has a role to measure and assess student achievement in recognition of learning achievement on education unit level. USBN implementation must be therefore carried out with applicable procedures and mechanisms in accordance with the law.

The above-mentioned government policies change, SMA Negeri 1 Kerambitan and SMA Negeri 1 Selemadeg are expected to hold USBN quality in accordance with applicable laws. One of USBN implementation indicator quality is assessment instruments compilation refer to established procedures and mechanisms. Having viewed on the cognitive level, USBN question indicators compiled, the teacher should reflect to standard competence/*Kompetensi Dasar* (KD) achievement. Therefore, it leads to life skills measurement in the 21st century, namely *4C* (*critical thinking, creativity, collaboration,* and *communication*) is expressed Halah Ahmed Alismail & Patrick McGuire (2015). In order to realize the expectations, the teachers are required to have extensive knowledge, insight, and creatively develop assessment instruments can measure *higher order thinking skills (HOTS)*.

According to Brookhart & Susan (2010), HOTS assessment characteristics are (1) measuring high-level abilities (*analyzing, evaluating,* and *creating*); (2) contextual-based problems containing case-based stimulus (*based on case*); and (3) non-routine (*unfamiliar*). Widana (2018), stated that HOTS questions strategic function on school exam is to prepare students mastering life skills in the 21st century, namely critical thinking, creativity, collaboration, and communication. Some abilities are tested on HOTS: (1) problem solving, (2) decision making, (3) inferences, (4) divergent thinking skills, (5) evaluative thinking skills, evaluating strategies used to solve problems regarded different perspective varieties, and 6) creativity is to find the new completion models different from previous ways (Jamal Raiynl, 2015).

Widana (2017), stated that HOTS questions are measurement instruments used to HOTS measurement. They are an ability to think is not ony *recall* and *restate* but also *recite*. HOTS questions on ability measure assessment context: 1) transfer one concept to another, 2) process and apply information, 3) look for links from different types information, 4) use information to solve problems, and 5) examine ideas and information critically. Nonetheless, HOTS questions do not mean is more difficult than *recall* question.

Having seen the knowledge dimension, HOTS question generally measures metacognitive dimension. It is not only to measure of the factual, conceptual, or procedural dimensions. Metacognitive dimension described an ability to relate several different concepts, interpret, problem-solving, choose the problem-solving strategy, new method discovery, reasoning, and right decision-making.

Widana (2017), stated that to write HOTS items, the question writer is required to be able to determine the behavior to be measured and formulate material. It will be used as the question basis (stimulus) particular context in accordance with the expected behavior. The material description will be asked (demand for high reasoning) is not always available in the textbook. Therefore, on HOTS questions writing, it is needed mastery of teaching material, skills on writing questions (questions construction), and the teacher's creativity on choosing stimulus questions according to the situation and condition in the education unit environment.

HOTS questions preparing steps are; (1) Analyzing on KD can write HOTS questions. Teachers choose first KD that can be written HOTS questions. Not all KD can be created by HOTS models. Teachers independently through *Musyawarah Guru Mata Pelajaran*/Subject Teachers Forum (MGMP) can analyze toward KD become HOTS questions. (2) Arranging question grid, the writing grid of HOTS question aims to help the teachers choose HOTS items. The grid generally is needed to guide the teacher included: (a) choosing KD to become HOTS questions, (b) choosing the related subject matter to tested KD, (c) formulating question indicators, and (d) determine cognitive levels. (3) Choosing an attractive and contextual stimulus. The interesting stimulus is generally new. The student has never been read. Contextual stimulus whereas means a stimulus is in accordance with reality in everyday life, interesting, encouraging students to read. (4) Writing questions in accordance with the question grid. The questions are written in accordance with writing items rules on HOTS. They are somewhat different from the general writing item rules. The difference lies in the material aspects, while the construction and language aspects are relatively the same. (5) Making guidelines for scoring (*rubrics*) or answer keys. Every HOTS item was written should be completed with scoring guidelines or answer keys. Scoring guidelines are made for the essay question. The answer key is made for multiple choice questions, complex multiple-choice (*true/false, yes/no*), and short filling in.

Mohd *et al.,* (2016), stated that the relationship between life skills in the 21st century and the ability to measure high-level thinking skills problem-solving was very significant. The world is in the 21st century faced with uncertain situations. The change is very dynamic and mastering high competition. It can cause clashes between certain groups. They have been potential to have an impact on tolerance. It is therefore needed an ability to think critically, creatively, communication, and collaboration (*living together*).

The cognitive level was formulated in Bloom Taxonomy was revised (Anderson & Krathwohl, 2001). They have six levels: remember (C1), understand (C2), apply (C3), analyze (C4), evaluate (C5), and creative (C6). Puspendik (2013), classified furthermore the six cognitive levels into three cognitive levels. Level-1 is knowledge and understanding (C1 and C2). Level-2 is application (C3). Level-3 is reasoning and logic (C4, C5, and C6). The cognitive level is the base for choosing *kata kerja operasional/*operational verbs *(KKO)*. It is an indicator to represent KD achievement. Understanding towards cognitive levels greatly influences the teacher's ability to describe KD as the question indicator.

Nayef *et al.,* (2013), stated that the accuracy of cognitive levels selection on the test preparation is very influential on the accuracy of competency achieve (learning objectives) measured. Furthermore, Bush *et al.,* (2014), suggested that to improve learning outcomes, the teachers should have an adequate understanding of a

thinking level. Volante & Beckett (2011), stated that the assessment implementation conducted should focus their attention on the compatibility between the competence demands with reference to indicator as to the right measurement tool. The measurement results, thus, are more valid.

The understanding of the cognitive level is important for the teachers in the test preparation. McNeil (2011), stated that evaluation cannot be separated from the learning process. Therefore, the stages to achieve certain competency learning are closely related to the KKO selection accuracy on the indicator preparation. A good question indicator should be able to appropriately measure learning objectives. This is in accordance with Thomas *et al.,* (2013). Their opinion stated that on the preparation of the question for learning achievement. The teachers pay attention to the accuracy of the chosen cognitive level based on the competency taught demands in the class.

The mechanism for compiling USBN questions is regulated USBN POS issued on BSNP, included (1) preparation of operational-specific USBN grids, (2) writing question cards, answer keys, and scoring guidelines, (3) conducting qualitative analysis, (4) questioning package, and (5) USBN implementation can be *computer-based (USBN-BK)* or *paper-based pencil (USBN-KP).* USBN questions practically are prepared on the teacher's subject in their respective in MGMP forum.

The observation and interview results are conducted with the Headmaster, Vice Headmaster, and teachers in SMA Negeri 1 Selemadeg and SMA Negeri 1 Kerambitan. There were several problems faced for the two partner schools. 1) USBN question quality is very low. The lack of teacher training on the assessment conducted by the government. It has implications for the teacher's lacking of the knowledge and understanding of the technique of compiling USBN items. It has an impact on the low-quality questions made by the teacher. Most of the cognitive levels on USBN question indicators compiled. The teacher is only measured memory aspects (C1) and understanding (C2). USBN question items are compiled by the teacher did not describe KD demands on the curriculum. KKO selection is used on USBN level indicator is under KKO in KD. For example, KKO in KD requires the ability to "analyze" (C4), however, the question indicator only measures the ability "mention" (C1). Thus, the KD actually has not been achieved. This valuation model is not based on the life skills demands in the 21st century, namely the assessment to encourage students thinking critically, creatively, problem-solving skills, and decision making. 2) The questions percentage for HOTS measure in USBN question is very low. The question is caused by the teacher's less understanding and skills in compiling HOTS questions. USBN questions are made by the teachers, mostly only measure the ability to remember and memorize, small portion to measure the application ability and is not based on contextual problems. They are also routinely tested every year. Therefore, it is very familiar to students. Having seen from the form is also almost the same as the questions that have been tested before.

Data on the *Ujian Sekolah*/School Exam (US) implementation on the academic year 2015/2016 from the Vice Headmaster regarded Curriculum in SMA Negeri 1 Kerambitan stated that only three of 19 subjects were equipped with a question grid or around 15.78% and 16 other subjects (84.22%) not equipped with a question grid. Whereas, the Vice Headmaster regarded Curriculum in SMA Negeri 1 Selemadeg stated that only five of 19 subjects were equipped with a question grid or around 26.31% and 14 other subjects (73.69%) were not equipped with question grids. Furthermore, the two partner schools stated that before US tested, the item analysis was not carried out either qualitatively or quantitatively. It means that the question's quality used in USBN has not been known for its quality in terms of the writing rules and has not measured its characteristics (distinguishing competence, difficulty level, and relatively function). It can be concluded that the procedures and mechanism for USBN questions compilation were not followed. It defines that the compliance level and teacher compliance with the procedures and mechanisms for preparing US questions were still low.

The high gap between the US score average and the UN score average on the two partner schools, allegedly due to the high disparity between the US questions quality made by school subject teachers and UN questions made by the government. The quality disparity of US and UN questions is strongly influenced by the differences to the cognitive levels, item characteristics (differentiation, difficulty level, and deceptive functioning). US items characteristics are not known precisely due to before US question tested, it was never analyzed beforehand by the teacher both qualitatively and quantitatively. Data on US and UN achievements, as well as the difference in academic year 2015/2016 on the schools, are as follows.

Table 1
The comparison of US and UN achievements on IPA program in SMA Negeri 1 Kerambitan, the academic year 2015/2016

| No. | Subjects | US Score | | UN Score | | Deviation |
		Average	Category	Average	Category	(point)
1.	Indonesian Language	79,93	B	60,66	C	19,27
2.	English	80,91	B	63,12	C	17,79
3.	Mathematics	77,54	B	55,58	C	21,96
4.	Physics	77,40	B	64,45	C	12,95
5.	Chemistry	79,16	B	67,03	C	12,13
6.	Biology	77,93	B	68,49	C	9,44

Table 2
The comparison of US and UN achievements on IPS program in SMA Negeri 1 Kerambitan, the academic year 2015/2016

| No. | Subjects | US Score | | UN Score | | Deviation |
		Average	Category	Average	Category	(point)
1.	Indonesian Language	76,76	B	53,17	D	23,59
2.	English	79,73	B	43,40	D	36,33
3.	Mathematics	77,13	B	52,17	D	24,96
4.	Economy	78,13	B	42,59	D	35,54
5.	Sociology	78,73	B	48,04	D	30,69
6.	Geography	77,73	B	44,53	D	33,20

Table 3
The comparison of US and UN achievements on IPA program in SMA Negeri 1 Selemadeg, the academic year 2015/2016

| No. | Subjects | US Score | | UN Score | | Deviation |
		Average	Category	Average	Category	(point)
1.	Indonesian Language	85,36	A	68,56	C	16,80
2.	English	83,05	B	62,74	C	20,31
3.	Mathematics	82,92	B	58,76	C	24,16
4.	Physics	83,01	B	64,81	C	18,20
5.	Chemistry	83,52	B	64,86	C	18,66
6.	Biology	84,56	B	65,87	C	18,69

Table 4
The comparison of US and UN achievements on IPS program in SMA Negeri 1 Selemadeg, the academic year 2015/2016

| No. | Subjects | US Score | | UN Score | | Deviation |
		Average	Category	Average	Category	(point)
1.	Indonesian Language	82,81	B	58,68	C	24,13
2.	English	81,73	B	42,04	D	39,69
3.	Mathematics	81,48	B	49,18	D	32,30
4.	Economy	82,41	B	45,16	D	37,25
5.	Sociology	83,78	B	52,61	D	31,17
6.	Geography	82,71	B	46,03	D	36,68

If the above problems are not immediately addressed, it will have an impact on society's distrust for the education assessment results. The assessment instruments compiled cannot describe the actual student's abilities, the measurement results become biased. USBN and UN score gap is very high. The illustrated difference in USBN

questions quality compiled by teachers. UN questions are made by the government. Therefore, the increased teacher's competence in HOTS and USBN questions preparation is very urgent to find a solution.

Research Methods

This research is action research conducted in SMAN 1 Selemadeg and SMAN 1 Kerambitan. The research subject was teachers in SMAN 1 Selemadeg and SMAN 1 Kerambitan totaling 124 people. The research object was the teacher's understanding and skills on HOTS and USBN questions preparation. Data on teacher's understanding of HOTS and USBN questions preparation was collected using multiple choice form test conducted before and after the action was given on socialization form using a score of one or zero dichotomies. The teacher's skill data for compiling HOTS and USBN question was collected using observation techniques before and after being given action integrated assistance. The pretest and posttest questions are 30 items on multiple choice form. The data on the teacher's skills to compile HOTS and USBN questions was collected using observation techniques. The observation sheet consists of eight indicators using range score 1-3, score 3 states the teacher is highly skilled, score 2 states the skilled teacher, score 1 states the teacher is not skilled (Duckworth, 2010). The data obtained were analyzed descriptively quantitatively.

Results and Discussion

Simpang Tegar method was implemented for the teacher's in SMA Negeri 1 Selemadeg and SMA Negeri 1 Kerambitan. Their HOTS and USBN questions understanding preparation before being given information with an average of 55.67 increasing to 73.12. Likewise, the teacher's skills compiled HOTS and USBN questions before being given integrated assistance with an average of 44.73 increasing to 67.74. Thus, it can be concluded the method can improve teacher's understanding and skills on HOTS and USBN questions preparation.

The increase in teacher's understanding of HOTS and USBN questions preparation can be understood because after being given an understanding through socialization activities. The teachers understand the procedures and mechanisms for preparing questions towards HOTS and USBN. The following are HOTS questions examples were made by the teacher's sociology.

Question Card

Subject : Sociology
Class/Semester : XII/1
Curriculum : K-2013

Base competence	:	Understanding the various types and social change factors and their consequences in people's lives
Material	:	Social change impact
Question indicator	:	Presented news excerpts about the phenomenon of social change in society, students can conclude the appropriate social change impact
Cognitive level	:	L3 (Reasoning-HOTS)

Question No. 18

> *www.iputan6.com, Jakarta - Pemerintah Prancis dilaporkan telah mengambil tindakan tegas soal penggunaan smartphone di dalam sekolah. Awal pekan ini, otoritas setempat melarang siswa untuk memakai smartphone selama berada di sekolah. Dikutip dari The Verge, Jumat (3/8/2018), larangan ini berlaku untuk siswa yang berusia di bawah 15 tahun. Mereka diminta untuk meninggalkan smartphone-nya di rumah atau mematikannya selama berada di sekolah. Untuk tingkat pendidikan yang lebih tinggi, setingkat sekolah menengah atas, pemerintah memberikan kesempatan apakah sekolah akan memberlakukan aturan larangan smartphone ini selama kegiatan belajar mengajar.*
>
> *Larangan ini juga mencakup penggunaan tablet, komputer, dan perangkat lain yang terhubung ke internet. Kendati demikian, ada beberapa pengecualian, seperti bagi siswa penyandang disabilitas atau penggunaan yang menunjang kegiatan belajar mengajar.*
>
> www.iputan6.com, Jakarta - The French government has reportedly taken decisive action about smartphone use in schools. Local authority earlier this week prohibited students using smartphones in school. It was quoted from The Verge, Friday (08/03/2018), this ban applies to students under 15 years old. They were asked to leave their smartphone at home or turn it off in school. For higher education levels, high school level, the government provides an opportunity whether the school will impose this smartphone prohibition rule during teaching and learning activities.
>
> This prohibition also includes the use of tablets, computers and other devices connected to the internet. However, there are some exceptions, such as for students with disabilities or uses that support teaching and learning activities.
>
> Source: https://www.liputan6.com/tekno/read/3607718/prancis-larang-penggunaan-smartphone-di-sekolah

The above news quote shows one of the social change effects, namely ...
a. the emergence of progress in various fields of life
b. the emergence of new social structures and relationships
c. the emergence of different social institutions
d. the emergence of new values and norms in the society
e. the emergence of complex communication interaction patterns

Answer Key: D

The above question card looks the teacher's sociology began to understand the HOTS characteristics. The teacher has started writing questions using stimulus. Previously, in writing questions, the teachers generally did not use stimulus but immediately wrote the subject matter and the answers choice. Another progress can be appreciated is the stimulus question written by the teacher has begun to use contextual problems. regarding contextual stimulus, HOTS question is expected to develop student's critical thinking skills and creativity. In the above question, the ability tested is the ability to evaluate (*conclude*). In order to conclude, students must go through several thinking stages. For example, the students must understand the subject matter is assembled with social change on remembering realm, understanding, applying, and analyzing. Without mastering the material, the students will have difficulty concluding the social changes impact occur in accordance with the given case.

The teacher's ability to develop USBN questions increases. USBN questions compilation starts on writing a grid that is a format contains information about the scope and content/competencies will be assessed/tested. The purpose of the test grid is to formulate as precisely as possible the material scope to be tested, the question cognitive level, and its parts. Therefore, the formulation can be an effective guide for the question writer or test assembler. The teacher's next to write USBN items on the question card. The item author must pay attention to the rules of writing the item includes three aspects, namely material/substance, construction, and language aspects. The questions that have been written are then analyzed qualitatively. Qualitative analysis is carried out before the questions are used/tested. Components are considered in the qualitative analysis to include material aspects, construction, and language. The results of qualitative item analysis are categorized into three types: a) accepted, if all aspects are fulfilled; b) received by repair, if there are several components are not fulfilled on

the construction and language aspects; or c) rejected, if there are components are not fulfilled in the material aspect. The following is USBN question grid sample.

USBN Question Grid

Education   : High School
Subject   : Physics
Curriculum   : K-2013

No.	Tested Competency	Material Scope	Material	Cognitive Level	Question Indicator	Question Type
1	Learners are able to use reason related to electromagnetic induction	Magnetism, and modern physics	Electromagnetic induction	Reasoning (HOTS)	Given a conclusion statement from the results of Faraday's law experiments, students can analyze GGL induction size correctly	Multiple choices
2	Learners are able to apply knowledge about electromagnetic induction	Electricity, magnetism, and modern physics	Electromagnetic induction	Application	Given images of electrical circuits, students can calculate the GLD induction magnitude and related quantities	Multiple choices

The above USBN question grid was created by the teacher. It looks the teacher's skills have increased. The skill improvement can be seen from the compatibility on the question indicators formulation and the competencies tested. Previously, most of the question indicator formulation was made by teachers tended not to be connected with the abilities tested. The question indicator seems to stand alone without seeing the question indicator formulation should reflect the indicator's measurement being tested. Other advances are the formulation quality for the question indicators. The teacher has demonstrated their skills in choosing operational verbs. It can be measured and according to the abilities tested. The formulation quality for the question indicators also increases can be seen from the component completeness must exist on the indicator included: (1) subject/student, (2) measured ability, for example, on analyzing GGL, and (3) stimulus can be pictures, tables, experimental results data, discourses, graphics, etc. The cases form is used as a basis for compiling questions. The question indicators were made by the teacher could be made into the questions, the teachers have not compiled the question indicators, however, the question is immediately made. There are also question indicators were made by the teacher. Due to the questions cannot be made (difficult to understand by the writer's question). The problem is also faced by the previous teachers is the difficulty in determining the question cognitive level. This is due to the teacher's understanding of Bloom's taxonomy is not well. Therefore, the question cognitive level is not in accordance with the KKO selection and competencies tested. After being given outreach and assistance, the teacher's understanding and skills to develop USBN questions increased and followed the procedure for preparing questions.

Increasing the quality of the USBN questions were made by the teacher's seen in terms of the compiling items technique arranged according to the procedure. According to the rules for writing items, question indicators representing KD achievement, fulfilling the criteria for qualitative items analysis, and at least 20% of the questions on the HOTS test package items.

It is easy to accept the teacher's skills on HOTS and USBN preparing questions due to the items practical preparation is accompanied by the Resource Team. The integrated mentoring are practical activities carried out by the teachers to develop USBN assessment instruments intensively accompanied by the resource persons. In order for mentoring activities does not interfere with the teacher teaching schedule, the activities implementation is adjusted to the regular MGMP meeting schedule. The activity is a follow-up to the workshop activities. It aims to improve the teacher's skills to develop USBN assessment instruments quality and increased teacher's compliance regarded procedures for compiling USBN assessment instruments. Through this mentoring activity, the teachers are indirectly

directed to follow the procedure for preparing questions and must obey the procedures for preparing the correct items. During this time, the procedures and mechanisms for preparing items were often ignored and violated by most teachers. Through mentoring activities, US/USBN assessment instruments compiled by the teacher's expected to increase their quality. Therefore, the gap between the US and UN average scores is expected to be minimized.

Conclusion

The following conclusions can be drawn. (1) Teacher's understanding of HOTS and USBN questions preparation before being given information with an average of 55.67 increasing to 73.12. (2) The teacher's skills on HOTS and USBN questions compilation before being given integrated assistance with an average of 44.73 increasing to 67.74. Thus, it can be concluded *simpang tegar* method can improve teacher's understanding and skills on HOTS and USBN questions preparation. It is recommended that it can be conducted through integrated mentoring on the teacher's understanding first is to build to the socialization activities. The integrated mentoring activities have very high psychological effects. The teachers feel supervised and work together on MGMP team. Working in team indirectly can also facilitate the teacher's understanding and skills on writing items. MGMP team can provide understanding and skills to other teachers on the same MGMP.

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