

CHAPTER II

REVIEW OF RELATED LITERATURE

This chapter is provided to answer the literature needs for this research. It is presented into three sub chapters, namely the theoretical description, previous studies, and conceptual framework.

2.1 Theoretical Description

This section discusses related theories that support the research. Thus, the researcher describes some necessary theories to design a technology-based High Order Thinking Skills (HOTS) assessment for ninth graders of Junior High School. The theories are about today's trend in English language teaching, The 2013th curriculum, Assessments, Principle of Language Assessments, Designing HOTS test prototype, High Order Thinking Skills (HOTS), and characteristics of students in secondary education.

2.1.1 Today's trend in English Language Teaching (ELT)

The tremendous growth of technology in this global world also effect to education sector. The current trend of ELT cannot be separated with the technology. Nowadays, all categories of particular language learning activities, such as listening, speaking, reading and writing skills development are using technology (Pim, 2013). The presence of technology in education can support and increase the learning motivation. To learn listening, they can listen to their favorite English songs in their own smart phone. They can also watch movies in YouTube and learn about different English accents while trying to speak like natives. Reading will be more interesting because of digital comics in WebToon. They can practice their writing skills in their social media such as Instagram, Facebook, Blog, etc.

To fulfill the learners' need in the techno-era, the nation must always improve their quality such as in the form of technology-based or digital assessment. However, the students who were accustomed to digital assessments are different with the students who were not. One of the educator responsibility was to habituate them in dealing with Computer Based Test (CBT) to support the

nation's improvement which using CBT as the final examination. Furthermore, the improvement of PBT into CBT should be followed by the increase of questions' quality which could assess the students' higher thinking skills. Thus, the designed of HOTS Quiz which was integrated with technology as the current trend in ELT would be very suitable and beneficial. It should also meet the nation's current used curriculum.

2.1.2 The 2013th Curriculum

As the core of education, curriculum will be revised regularly to improve the quality of nation's education and fulfill the demands of the global world. It is known that the current used curriculum in Indonesia is 2013th curriculum. The implementation of 2013th curriculum to teach English introduces the way of teaching integrated skills. There is a difference among teachers to interpret competences as many of them are derived from psychomotor domains, specific competences derived from: language system (linguistic competence, sociolinguistic competence, discourse competence and strategic competence); macro-skills (productive: speaking and writing; and receptive skills: listening and reading); and micro-skills or the elements of language (grammar, vocabulary, pronunciation and spelling) as stated by Ahmad (2014). All competences above should not be addressed in isolated way, but it must be in integrative manners in all KI and KD.

The 2013th curriculum aims at developing the students' talent, interest, and potential in order to be character-based, competence-based, and literation-based generations, so they will be ready to face the real world's challenges (Ministry of Education and Culture, 2017). The transformation in teaching, learning, and assessments in primary, secondary, and higher level of education are required to achieve the goal, so that all students have the deeper learning competencies that are needed after they graduate.

Every instructional design in ELT must be based on the current used curriculum by the institution. Therefore, the assessment must be the appropriate measurement instrument in assessing the students' HOTS according to the 2013th curriculum. In SMP Negeri 1 Sedayu, the 2013th curriculum has been almost fully

implemented especially for the ninth graders in academic year 2017/2018. Thus, the designed of HOTS Quiz according to the 2013th curriculum was very appropriate.

2.1.3 Assessment

As the bridge between teaching and learning, assessments may become one of the most powerful ways of improving student achievement. The assessment of learning result is the information or data collecting process about student's achievements in attitude, knowledge, and skills aspect which is done systematically to observe the process, study progress, and study result improvement by giving an assignment and evaluation as stated in Ministry of Education and Culture regulation (Permendikbud) number 53, 2015.

According to Suharsimi Arikunto (2015), learners can know how far their learning progress is by doing assessment and teacher can determine whether the students have mastered the subject or not, the appropriateness of the given material, and also the suitability of the teaching method. Assessment may become a way of motivating students, measuring progress and checking on learning. Students are motivated especially if they like a subject and want to prove they really master it to the teacher and parents. Assessment provides valuable feedback to the teacher on their own teaching methods.

Brown (2004) examines that assessment is a continuing process that involves a much broader domain, whilst test is the subset of assessment. When students are active during the teaching and learning process by responding to teacher's questions or offering comments, teacher subconsciously assesses the students' performance. The relationship between assessment and test can be seen in the following figure.

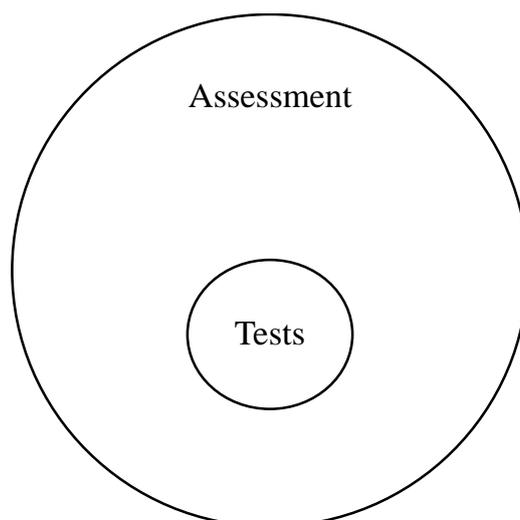


Figure 2.1 Relationship of Assessment and Tests

2.1.3.1 Formative and Summative Assessment

Assessment can be functioned as formative and summative assessment. Brown (2004) clearly explained that most of assessment in classroom which evaluate students in the process of “forming” their competences and skills to help them continue the process is formative assessment. Informal assessment which focus on ongoing process of learners’ understanding includes as formative assessment. While summative assessment aims to determine, or conclude, what a students has comprehended, and usually occurs at the end of a course or unit of instructions. Final exam and general proficiency exam are examples of summative assessment because the purpose are to measure about what students’ have learnt.

In this case, the researcher’s product was considered as the summative assessment. Thus, the purpose is to determine how far the learners’ understanding about the previous materials they have studied before.

2.1.3.2 Assessing Reading and Writing

In foreign language learning, reading is a receptive skill that is expected to be acquired by the learners. There are several genres of reading, however, in the designed of HOTS quiz, it was focused on personal reading genres include letters, greeting cards, invitation, messages, notes, announcement, etc which based on the blueprint of UN.

In reading comprehension, the following principal strategies are possible criteria to be assessed (Brown 2004): 1) the purpose of text; 2) spelling rule application; 3) lexical analysis; 4) meaning guessing; 5) text skimming; 6) scanning information; 7) silent reading; 8) understanding charts; 9) literal and implied meaning; and 10) capitalization on discourse markers. The design of HOTS quiz took several strategies to assess learners' reading ability, such as meaning guessing, text skimming, and implied meaning. The formats were reading comprehension passage and multiple choice cloze test.

Writing is one of the productive skills which consider as the most difficult skills in language learning. Similar to reading, the chosen genres of writing was personal writing genres. The chosen task to assess writing was the ordering task.

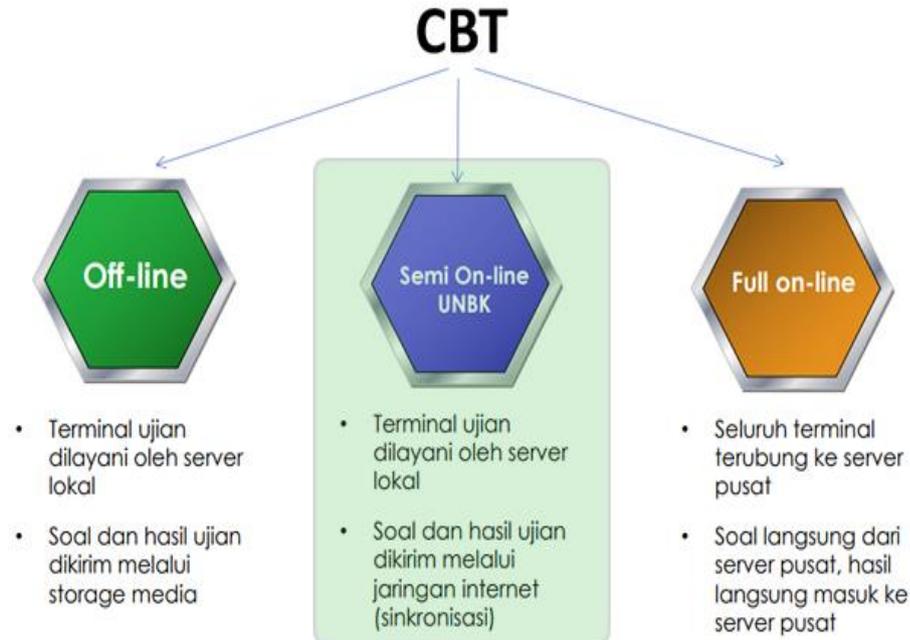
2.1.3.3 National Examination

As one of standardized assessment in Indonesia, National Examination (*Ujian Nasional* or UN) was designed and managed by BSNP and firstly introduced in 2003. From 2003 until 2014, UN has been the main factor in determining whether someone can or cannot graduate from school. All the other assessments are not as powerful as UN. During that era, if a student succeed daily in school, but get a score lower than the minimum UN score required to graduate from school, then they will not graduate. However, nowadays, UN is no longer serves as an exclusive determining factor in student graduation, but rather, it serves to map the quality of the learning program and/or the school as mentioned in the Government Regulation of the Republic of Indonesia No.13 Year 2015. Therefore, the detail condition of education in Indonesia can be portrayed by this educational mapping, and thus some follow up actions can be further taken to improve it.

In 2014, Indonesia has implemented the CBT national examination in Indonesia-Singapore junior high school and Indonesia-Kuala Lumpur junior high school. The students' literacy to ICT (Information and Communication Technology) has increased. CBT National examination system is an effective solution for carrying out the evaluation or educational assessment conducted on large number of students (Sulistyaningsih, 2016).

The following are some advantages of computer based testing (Brown, 2004): 1) classroom-based testing; 2) self-directed testing in some aspects of a language, such as vocabulary, grammar, discourse, one or all of the four skills, etc; 3) practice for upcoming high stakes standardized test; and 4) large scale standardized test can be administered easily with rapid reporting of result. Consequently, the computerization of testing also results some disadvantages as follows: 1) lack of security and possibility of cheating in unsupervised computer test; 2) open-ended response are less; and 3) the oral production is absent.

In 2017, there are 30.577 schools using *UNBK* or *CBNE* consisted from 11.096 SMP/MTs, 9.652 SMA/MA and 9.829 SMK. The result is caused by the resources sharing policy by *Kemendikbud* to introduce the limited school computer facility to conduct the *UNBK* in another school with the available computer facility. The *UNBK* still uses semi-online system where the test script will be sent from the central server online by synchronized network to the local server (school), then the exam will be held offline using the local server. Next, the exam result will be sent back to the center server online (upload).



Source: <https://unbk.kemdikbud.go.id/>

Figure 2.2 The *UNBK* System

In 2018, the percentage of schools which conducting *UNBK* was increased. It is also happen in SMP Negeri 1 Sedayu which conducted *UNBK* independently at the first time in 2018. In the previous years, the students were having *UNBK* in SMK Negeri 1 Sedayu. Therefore, it was very crucial needs to prepare the students more in dealing with *UNBK* by implementing the product of this research. By conducting better preparation, it was expected to improve the students' exam result.

2.1.4 Principle of Language Assessments

There are some important criteria in testing a test which should be consider when designing language assessments, namely practicality, reliability, validity, authenticity, and washback (Brown, 2004). The practicality means that the test is effective in its cost, time allocation, administration, and time-efficient of scoring/evaluation. Next, the reliability means consistent and dependable whether in fluctuations in the student, in scoring, in test administration, and in the test itself. Then, the validity relates to the inference made from the test results which are appropriate, meaningful, and useful in terms of the purpose of assessment. After that, the authenticity is where the task is likely to be enacted in the "real world". Finally, the washback implies that the students have ready access to discuss the feedback of the given test.

2.1.5 Designing Classroom Language Test

In designing classroom language test, Brown (2004) states some crucial aspects which can be used as guidelines, such as: 1) the purpose of the test; 2) the test objectives; 3) test specification which appropriate with the purpose and objectives of the test; 4) selected tasks; and 5) scoring, grading, and feedback. By determining the purpose of the test, the objectives can be established later. Then, the test specification must be well-arranged to fulfilled both purpose and objectives of the test. Next, the suitable task will be selected before considering the scoring, grading, and feedback.

In this study, the purpose of the test was in line with the 2013th curriculum demand, especially to face the challenges of 21st century. Furthermore, the

objectives of the test was to facilitate the students in digital learning environment and also habituate them in solving higher order thinking questions which require an ability to analyze, evaluate, and create. Next, the applicable test specification and the selected task was multiple choice digital test which includes HOTS questions. Thus, immediate feedback and scoring will be automatically given right after the learners solved the given test.

2.1.6 Designing Technology-Based High Order Thinking Skills' Test Prototype

In designing the HOTS Quiz test prototype, there are some related information to be considered such as the iSpring Suite as the main software, HOTS, and the way to design HOTS test prototype. The following are the explanation of each point.

2.1.6.1 iSpring Suite 9

iSpring Suite 9 is the current update of iSpring Suite products. This software is very useful to design various interactive quiz, such as multiple choice items, matching, short answer, jumbled sentence, and so on. The software can stand alone or support the function of another software, such as Ms. PowerPoint. The combination of both software could produce well-designed of interactive assessment which can be converted to flash or HTML formats. Therefore, it is used as the main software to design the test prototype. The quiz product can be open from both computer and mobile phones.

2.1.6.2 High Order Thinking Skills (HOTS)

The core frameworks of 21st-century skills as stated by Scott (2017) such as: 1) learning and innovation skills, 2) life and career skills, and 3) information, media, and technology skills. Therefore, education plays a significant role to meet the urgent need in 21st-century which is not simply on learners' ability in obtaining information, but on their ability to analyze, synthesize, and apply what they have studied to face new obstacles, create solution, collaborate in effective way, and be able to communicate persuasively. Achieving that goal will require a

transformation in teaching, learning, and assessments in every level of education, so that all students have the deeper learning competencies that are needed after they graduate.

According Krathwohl (in Wilson 2016), HOTS is a thinking skills that not only requires the ability to remember, but also other higher capabilities include the ability to analyze, evaluate, and create.

Table 2.1 Description and Key Word of Bloom's Taxonomy Revision by Schraw et al. (2011: 191)

CATEGORY	KEY WORDS	
Remembering: <i>can the student recall or remember the information?</i>	Mention the definition, imitate the pronunciation, state the structure, pronounce, repeat, state	LOTS-Lower Order Thinking Skills
Understanding: Can the students explain the concept, principle, law or procedure?	Classify, describe, explain the identification, placed, report, explain, translate, paraphrased.	
Applying: Can students apply their understanding in new situation?	Choosing, demonstrating, acting, using, illustrating, interpreting, arranging schedule, making sketch, solving problem, writing	
Analyzing: can students classify the sections based on their difference and similarity?	Examining, comparing, contrasting, distinguish, doing discrimination, separating, test, doing experiment, asking	HOTS-Higher Order Thinking Skill
Evaluating: can students state either good or bad towards a phenomenon or certain object?	Giving argumentation, defending, stating, choosing, giving support, giving assessment, doing evaluation	
Creating: can students create a thing or opinion?	Assemble, change, build, create, design, establish, formulate, and write.	

HOTS are very important skills for today's generation. However, it needs good collaboration between all teachers of every subjects to habituate the learners in using their HOTS by solving the problem, thinking critically and creatively, and making decision based on the given context. One of the way to train the students' HOTS is using the appropriate HOTS assessment.

2.1.6.3 The Design of the HOTS Test Prototype

There are some important points to be concerned in designing HOTS assessments such as: (1) choose the appropriate materials (stimulus) toward the indicators of the questions; (2) check the stimulus by considering that it is beneficial, reflecting the curriculum, interesting, relevant and appropriate; (3) aim at assessing the students' skills of analyzing, evaluating, and creating (Christina Tulalessy, 2017).

Three item/task formats are useful in measuring higher order skills: (a) selection, which includes multiple-choice, matching, and rank-order items; (b) generation, which includes short- answer, essay, and performance items or tasks; and (c) explanation, which involves giving reasons for the selection or generation responses. To selecting HOTS Questions from the previous ENE, the instrument of analyzing HOTS questions according to *Direktorat Pembinaan SMA Ditjen Pendidikan Dasar dan Menengah* (2017) in module of HOTS questions development was used as follows:

INSTRUMEN TELAAH SOAL HOTS BENTUK TES PILIHAN GANDA/URAIAN

Nama Pengembang Soal :
Mata Pelajaran :
Kls/Prog/Peminatan :

No.	Aspek yang ditelaah	Butir Soal				
		1	2	3	4	5
A. Materi		V	V			
1.	Soal menggunakan stimulus yang menarik (baru, mendorong peserta didik untuk membaca).					
2.	Soal menggunakan stimulus yang kontekstual (gambar/grafik, teks, visualisasi, dll, sesuai dengan dunia nyata)*	V	V			
3.	Soal mengukur level kognitif penalaran (menganalisis, mengevaluasi, mencipta) yang dalam penyelesaiannya dicirikan dengan salah satu atau lebih tahapan proses berpikir berikut: <ul style="list-style-type: none"> • Transfer satu konsep ke konsep lainnya • Memproses dan menerapkan informasi • Mencari kaitan dari berbagai informasi yang berbeda-beda • Menggunakan informasi untuk menyelesaikan masalah • Menelaah ide dan informasi secara kritis 	V	X			
4.	Jawaban tersirat pada stimulus.	V	V			

*) Khusus mata pelajaran bahasa dapat menggunakan teks yang tidak kontekstual (fiksi, karangan, dan sejenisnya).

**) Pada kolom nomor soal diisikan tanda silang (X) bila soal tersebut tidak memenuhi kaidah.

.....
Penelaah

.....
NIP.

Figure 2.3 HOTS multiple choice questions analysis instrument

The multiple choice items in the some latest ENE were analyzed and selected based on the students' thinking skills which were expected to be assessed. The questions which only assessed the remembering (C1), understanding (C2), and applying (C3) level were not included in the designed assessments. The questions which assessed the analyzing (C4), evaluating (C5) and creating (C6) level were chosen as the questions in the designed HOTS assessment.

2.1.6.4 The Quality of Technology-Based Media

Media and education cannot be separated. According to Loretta, Green, and Hansen (2012), at the very first time, education has been influenced by a variety of factors such as social, economic, political and media technology. However, the most influential factor is media technology. Technology has completely integrated into every aspect of students' lives. These students (often called the Internet Generation, Generation Y, millennial or digital natives) claim high levels of ownership and use of various technologies.

Besides the assessment quality, the quality of the product must be concerned in software development. Besin (Pressman, 2010) states that the quality of software meant that it is effective and valuable for the designer and users. The basic qualities of the software are the technical and program quality. The technical quality is related to the layout, background, design, material integration, clarity and readability. While the program quality is related to the presentation, program navigation, button functioned, etc. Those criteria of software quality were used as the expert judgement criteria to judge the product appropriateness.

2.1.7 Characteristics of The Ninth Graders of Junior High School

The following are some characteristics of Junior High School students: 1) more outgoing and happy; 2) usually less sensitive and irritable; 3) relationships with parents, siblings, and other adults tend to be more stable to high school; 4) appears to be more mature and self-confident; 5) expresses themselves better; 6) possesses a good sense of humor; 7) prides self on good grades and athletic skills; 8) social acceptance of interaction between boys and girls; 9) needs to learn on

own, try out things, and to explore self. Furthermore, they are digital native generation who was growing up using technology and felt confidence in using it.

According to a survey conducted by Paul and Scott (2010), the first generation to appear in the new millennium are those born after 1980. The survey reports that in comparison to other generations, the digital natives believe that their unique identity is due to their affiliation with technology such as social networking sites, wireless technology, video games and self-created videos. A further study reports that 74 percent of teens aged twelve to seventeen have mobile access to the Internet (e.g., phone, tablet and similar devices), while 24 percent have posted videos of themselves on social media (Scott and Paul, 2012).

By considering their characteristics, the designed assessment was made as interesting as possible. It was designed in order to familiarize them more to the CBT system which became their today's need.

2.2 Previous Studies

In finishing this research, the researcher has reviewed some studies that are related with this research.

Firstly, the researcher examined the journal entitled *The Development of Higher Order Thinking Skill (HOTS) Instrument Assessment in Physics Study* by Merta Dhewa Kusuma, Undang Rosidin, Abdurrahman, and Agus Suyatna which published in *IOSR Journal of Research & Method in Education (IOSR-JRME)* accessed in www.iosrjournals.org as the main research reference. The previous research findings adapted Borg & Gall model. The assessment instrument was developed based on HOTS indicators include the ability to analyze (C4), evaluate (C5), and create (C6). Results of the research were indicator of the ability to analyze (C4), evaluate (C5), and create (C6) which has been developed are ability to analysis of factual, conceptual, procedural, and metacognitive knowledge; and the HOTS assessment instrument as assessment for learning is effective to train student's HOTS and effective measure student's thinking skills in accordance with the level of each student's thinking.

The different of the previous study was the emerged of technology in the assessment design, the different research settings and focus in English Language Teaching area.

The second research is from Syaiful Rohman Hidayat in 2016, entitled “Designing English Learning Interactive Multimedia for Grade X Students Based on 2013 Curriculum”. The similarities and relations of his research and this research were the type of research, the form of the research, and the form of the product. The research type of both researches was R&D. The model that was used also similar, that was ADDIE Model. Thus, the steps of conducting the research were equal. The product was also similar since it was a soft file product. Yet, it had a difference, the objective of his research was to design a material, while the objectives of this research was to design a package of assessments. The form of the research was almost similar since we were from the same University.

The third research is from Faizal Guntur Pratama in 2016, entitled “*Pengembangan Sistem Tes Terkomputerisasi Sebagai Media Latihan Siswa SMK pada Mata Pelajaran Teori Kejuruan Teknik Elektronika Industri*”. The similarities and relations of his research and this research are the type of research, and the form of the product. The research type of both researches was R&D. However, his research adapted Waterfall model by Sommerville while this study will adapt ADDIE model. Thus, the steps of conducting the research were not equal. The product was also similar since it was in the form of a soft file product. Yet, it has a difference, the main objective of his research was to design a computerized test for Industrial Electronics Technique in Vocational High School, while the objectives of this research was to design a quiz as national exam simulation for ninth graders in Junior High School.

From those previous studies, it can be concluded that the relation of their research and this research was to design a product by conducting R&D research.

2.3 Conceptual Framework

The purpose of this research was to design a technology-based standardized HOTS assessment for the ninth graders of SMP Negeri 1 Sedayu in the form of tryout. The assessments were designed by selecting the latest national

examination in academic year 2012/2013 until 2016/2017. It was in the form of CBT containing standardized HOTS assessment package.

Based on the researcher early observations, there were some problems happen in the research setting related to the assessments, such as: (1) the available media could not be utilized maximally because of teacher's less ability in designing digital assessment's product; and (2) the students were less acquainted in solving questions which require higher order thinking skills.

One of the ways to handle those problems was by designing a technology-based standardized HOTS assessment to habituate them in dealing with CBT system. The Research and Development (R&D) using ADDIE model were chosen to help the researcher in designing the product. The product of the study was expected to help the teacher in conducting simulation of digital HOTS Quiz.

To make the framework clearer, it will be explained by a fish bone diagram below.

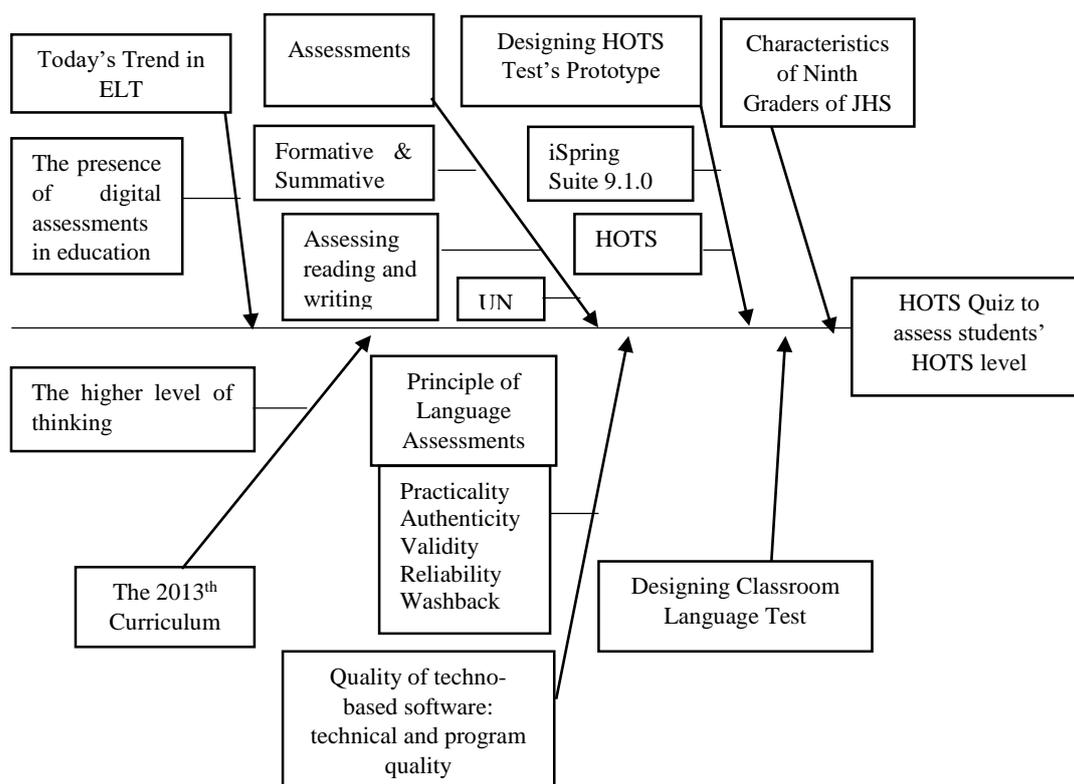


Figure 2.4 The Conceptual Framework of this Research (Research Stages).