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Content analysis of the Bachelor of Technical-Vocational Teacher Education's curriculum: Basis for retooling workshop

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Abstract

Analysis on the content of a curriculum is a pivotal undertaking to ensure that its contents are still relevant in addressing the needs of the students. One way of doing this is scrutinizing the contents of the syllabus were essential information such as topics, teaching and learning strategies and ways of assessment are enclosed therein. Also, the TOS and TQ's were essential, as well. At this juncture, the study was undertaken to analyzed the contents of the those documents which includes the following findings: Majority of the verbs used in stating the Intended Learning Objectives (ILO) belongs the Lower Order Thinking Skills (LOTS) category; the limited number of learning activities subjects and offers varieties of assessment tasks and utilizes only a handful number of assessment tasks; non – major and specialization course conducts summative exams that belongs to middle and high order thinking skills and conducts examination that only measures the cognitive domain and not the psychomotor domain; and most belong to the lower order thinking skill; respectively; furthermore; traditional paper and pencil types of examinations/test items were furnished test types. Almost of all of the courses analyzed were not aligned in the four (4) variables used, presented in the two documents which were the Syllabus and the TOS and TQs, respectively; and an activity called "Project Well Re-Structured Instruction Through Enhancement Sessions (WRITE)" was conceptualized and develop to a retooling tool in enhancing syllabus and TOS documents.

Keywords: systematic literature review, action research, research gaps, research agenda, research framework, curriculum, learning outcomes, retooling workshop

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1. Introduction

The Bachelor of Technical Vocational Teacher Education (BTVTED) program was crafted in response with the "shift to learning competency-based standards / outcomes-based education" in response to the 21st Century Philippine Teacher – Education framework. (CMO 79, s.2017). Primarily, the program aims to prepare and equip the Pre – service teacher the necessary knowledge and skills to teach different competencies in the Technology and Livehood Education (TLE) subjects in the Junior High School (specially Grades 9 and 10), in the Senior High School (for the Technical – Vocational Education strands) and in the Higher Education Institution where the same program is being offered.

One of the important document the comprises the course are the syllabus. The course syllabus is an annual document being submitted subject by course Facilitators twice a year and is construed also as the blue print of a course that are offered every semester. According to Wheeler, et. al, the course syllabus is a physical artefact outlining key structural elements of course, including general course information. Considering that this document is the guide of the course facilitator in rendering its contents to students, then it is imperative that such is supposed to be organized and alignment should be evident if they want to achieve every course outcome at the end of each course topics. And the only way in which this is to be achieved is for these documents to be analyzed in terms of its contents.

The table of specifications, on the other hand shows the six cognitive levels of learning domain. It summarizes a representation of these domains through a summative examination. According to Gibson (2017) it can foster, either a mastery, or performance, or orientation towards learning depending on how the elements such as learning objectives and assignments are framed. Additionally, Fives and Barnes (2018) stresses that is used to help teachers frame the decision making process of test construction and to improve validity of teacher's evaluation based of test constructed for classroom used. Moreover, alignment of its contents in the achievement of the learning outcomes and its learning objective is of utmost importance. According to Gronlund and Brookhart (2009), alignment is when there is consistency across the program with precise connections between evaluations, course goals and learning tasks. It is important to align learning objectives with instructional strategies and assessments to ensure that everyone involved is aware of the expectations. In turn, assessments that align with the outcomes and planned learning activities help teachers and students determine whether, and to what extent, the outcomes have been achieved. If assessment mirrors the learning outcomes and the teaching and learning activities, students will achieve the learning outcomes, as teachers and learners will be focused on the same goal (Biggs, 2003).

Learning activities (pedagogies) that are used by the course facilitators should be reflected on both the formative assessments and summative examinations. According to Ruge & Tivendale (2019), if learning strategies are consistent with skills demonstrated on a test, students will more easily reach the learning goals. Tasks and activities serve as opportunities to practice skills taught in preparation to demonstrate it on an evaluation. It is at this light that the study is conceptualized. It aimed at analyzing the contents of these documents specially their alignment and it is hoped to shedding light on the improvement of students' academic achievement.

2. Methodology

Research Design. The study employed the Descriptive – Evaluative research design employing the Documentary Analysis method. The study employed the Descriptive – Evaluative research design employing the

Documentary Analysis method to achieve the desired output. Descriptive research obtains facts about existing conditions or detects significant relationships between current phenomena. Evaluative research is a research method used to evaluate a concept and collects data to help improve a solution. It also entails carrying out a structured assessment of the value of resources committed in the attainment of a goal gathering and analyzing useful information. (www.formplus.blog.) It employs Documentary Analysis where it is defined as: a type of qualitative research in which documents are reviewed by the analyst to assess an appraisal theme. Dissecting documents involves coding content into subjects. Hence, the method is appropriate for it shall appraise documents which serve as basis in delivery of instruction; which somehow measures achievement of students.

Selection and Study Site. The researcher is the Program Head of one of the course program offered in his school and was the one checking the documents which were submitted on a semester basis, hence, this was his avenue of conducting the said endaevor. The study was conducted at Ilocos Sur Polytechnic State College, Santiago Campus, Santiago, Ilocos. Total enumeration of all the syllabus for one school year were utilized for the needed data. A total of 198 syllabus and 99 Table of Specifications (TOS) and Test Questions (TQ's), respectively.

Research Instrument. A simple Matrix created by the researcher was devised in order to obtain necessary data needed in the study.

Data Gathering Procedure. The researcher requested to the permission of the Campus Administrator to accessed the Syllabus, Table of Specifications and Test Questions for two semesters, for the A.Y. 2023 – 2024. Documents consisted of 198 syllabus copies of each courses which are broken down as follows: General Education (11), PathFit and Rizal (5), Professional Education (11), TVTED (12). Areas of specialization consisted of: Automotive Technology (12), Electrical Technology (12), Electronics Technology (12), Food and Service Management (12) and Garments Fashion and Design (12). Table of Specifications and Test Questions were also 99 each, respectively. Additionally, the BTVTED curriculum was also requested to served as guide for the subjects that are offered each semester. Using a matrix which the researcher had developed, the details on each the documents accessed were written on it as preliminary data before finally encoding for analysis purposes. Data gathered were tallied and analyzed.

Analysis of Data. Frequency count and percentages was used to determine the Intended Learning Objectives (ILO), Intended Learning Activities (ILA), Assessments Tasks (AT) and level of domains in the Table of Specifications and types of tests. Coding was used to determine the alignment of the variables found in the syllabus. Elliot (2018) emphasizes that Coding is a way of making text relevant, of essentially indexing or mapping data, to provide an overview of disparate data that allows the researcher to make sense of them in relation to their research questions. Most simply, it can be a way of tagging data that are relevant to a particular point; you may want.

3. Results and Discussions

The summary of verbs used for the Bachelor of Technical – Vocational Teacher Education (BTVTEd) subjects can be seen in table 1, encompassing all the four major subject groups of the course which includes, General Education (GE), Professional Education (Prof. Ed), Technical Vocational Teacher Education (TVTED) and so with the area of specialization which are: Automotive Technology (AT), Electrical Technology (ET), Electronics Technology (ETC), Food and Service Management (FSM) and Garments, Fashion and Design. It can be seen from the table that it registered a grand total of six hundred ninety eight (698) verbs used in crafting the objectives in the syllabus which were divided into five (5) categories which are Lower Order Thinking Skills (LOTS), Middle Order Thinking Skills, Higher Order Thinking Skills (HOTS), Not in the List (NIL) and Words to be Avoided (WTA). The table clearly manifests that varieties of verbs where used in making the Intended Learning Outcomes (ILAs).

Table 1
Summary of Verbs used in creating objectives in the syllabus

Levels of Thinking Skills / Subjects	GE	Pr.Ed	TVTED	AT	ET	ETC	FSM	GFD	F	%
Lower Order Thinking Skills (LOTS)	98	42	47	29	42	34	45	20	357	51.22
Middle Order Thinking Skills (MOTS)	18	23	12	6	9	19	12	6	105	15.06
Higher Order Thinking Skills (HOTS)	36	20	32	9	12	16	24	11	160	22.96
Not in the List (NIL)	13	7	17	6	4	2	5	8	62	8.90
Words to Avoid (WTA)	5	0	6	1	0	0	1	1	14	2.01
Total									698	100

Legend:
G.E. - General Education | Pr.Ed. – Professional Education | TVTED – Technical Vocational Teacher Education | AT – Automotive Technology
ET – Electrical Technology | ETC – Electronics Technology | FSM – Food and Service Management | GFD – Garments, Fashion and Design

Specifically, almost half of those verbs were categorized to be LOTS with a percentage of fifty one and twenty two (51.22) in which G.E. TVTED F.S.M. and Prof. Ed and E.T. registered to have utilized verbs belong to to this category. This is because every topic and sub topic on these subjects had its own objective, unluckily were chosen among the LOTS group. On the other hand, only a handful of verbs were used under the HOTS category having a subtotal percentage of twenty two and ninety six (22.96) only. When taken singly, only the subjects G.E., TVTED, FSM and Prof. Ed. had dominated the list in using verbs under this category, yet not so many. It is also interesting to note that there were verbs used which were not included in the list with a percentage of eight and ninety (8.90) meaning Instructors used them as verbs, yet how were they able to achieve it at the end of the lesson if such were not enlisted. Furthermore, there were also a small percentage of two and zero one (2.01) verbs which were manifested in the documents as words to be avoided. Same principle applies then, their achievement at the end of the lesson. The generality of an objective for a topic that has sub topics should not tolerated. This means that a general objective for a whole chapter may be done but that will never include the sub topics. This further means that a sub – objective, emanating from the main objective should be made for specific purposes, it is like breaking down the main objective into specific parts for a clearer understanding of the objectives to be achieved at the end of each topic or lesson.

It is interesting to note that as teachers, when we were making out lesson plans; our objectives should be crafted using the three (3) domains of learning, which are the Cognitive, Psychomotor and Affective. Cognitive are the verbs that pertains to mental exercises; psychomotor are the ones that develops the skills while affective are the ones that shapes the behavior or attitude of the learner. While it is true that there is no Lesson Plan in the college level and only the syllabus serves as the guide of the Instructor in going through the course of the subject, the affective domain has been disregarded. There were not listings of verbs that the researcher encountered about the affective domain. Only the two domains were evident and for that matter, the researcher wonders. Knowing that collegiate studies is not an exception to the rule of integrating values to their students because this is still a needed domain, it is imperative then that such be observed to be manifested as verb used in making Intended Learning Outcomes and it should never be a discretion.

Table 2 shows the summary on the distribution of Intended Learning Activities along lecture and laboratory. The first half of the table reveals that among the eight (8) top most activities cited, lecture (35.11%), discussion (27.78%) and reporting (10.22%) ranks the top 3 most used learning activity. This implies that teacher is still the center of learning where he/she provides the necessary information for student learning. While it is true that in the third learning activity is reporting where students are supposed to render their topics, however, the responsibility of the teacher for supplantation of ideas and explanations is still imperative. Other learning activities includes film viewings, demonstrations, performance activities and conducting researches. Such varieties of learning activities will cater to learners' multiple intelligences and individual differences. Zen (2021)

concluded that Teachers look for ways to increase student motivation and engagement in the classroom. Differentiated instruction provides an opportunity for teachers to consider student learning preferences when creating curriculum and potentially allow for students to be more active in their learning. There are numerous ways to differentiate instruction whether it is through the way students are grouped or through content, process, and product.

Table 2
Summary on the Distribution of Intended Learning Activities (ILA's) along Lecture and Laboratory

Activities / Courses	G.E	Pr.Ed	TVTED	A.T	E.T	ELT	FSM	GFD	f	%	Rank
Lecture	19	11	23	17	27	28	15	18	**158**	**35.11**	**1**
Demonstration	1	-	8	4		3	13	2	**31**	**6.89**	**5**
Discussion	17	9	8	5	28	36	15	7	**125**	**27.78**	**2**
Performance Activity	-	-	6	-	-	-	-	-	**6**	**1.33**	**7**
Brainstorming	-	-	5	-	-	-	-	-	**5**	**1.11**	**9**
Film Viewing	7	-	4	16	18	-	-	-	**45**	**10.00**	**4**
Reporting	-	17	3	-	-	-	26	-	**46**	**10.22**	**3**
Conducting Research	-	4	1	-	-	1	-	-	**6**	**1.33**	**7**
Reading /Reflection	10	6	3	6	-	1	-	2	**28**	**6.22**	**6**
Total	54	47	61	48	73	69	69	29	**450**	**100**	
Hands on Exercises	-	-	-	6	5	10	57	6	**84**	**65.63**	**1**
Read / Discussions	-	-	-	2	2	2	1	6	**13**	**10.16**	**3**
Demonstration	-	-	-	4	5	1	3	7	**20**	**15.63**	**2**
Drawing / Inter.	-	-	-	-	7	1	-	3	**11**	**8.59**	**4**
Total									**128**	**100**	

On the same table, it can be gleamed the different Intended Learning Activities that be being utilized in the laboratory. Hands on Exercises (65.63%) and demonstration (15.63%) registered the highest percentages. This means that students in the laboratory performs tasks that are being tackled during the lecture. This means of activity reinforces the knowledge through actualization in the form of a task, as this was usually done in technical courses. Kibga et. al (2021) affirms that learners can better express their curiosity when they collaboratively learn using materials that they are familiar with. This further means that participation in actual activities makes learning more effective.

Table 3
Summary on the Distribution of Assessment Tasks (AT) along Lecture and Laboratory

Activities / Courses	G.E	Pr.Ed	TVTED	A.T	E.T	ELT	FSM	GFD	f	%	Rank
Exam – Oral /Written	30	5	13	15	31	28	29	34	**185**	**57.45**	**1**
Quiz	12	6	-	4	-	6	10	1	**39**	**12.11**	**3**
Recitation	11	3	4	1	-	22	3	-	**44**	**13.66**	**2**
Practical Exams	4	1	1	5	4	1	2	4	**22**	**6.83**	**4**
Performance	3	1	1	5	-	3	2	4	**19**	**5.90**	**5**
Research Paper	3	4	-	-	-	-	-	1	**8**	**2.48**	**6**
Essay	1	4	-	-	-	-	-	-	**5**	**1.55**	**7**
Total	64	24	19	30	35	60	46	44	**322**	**100**	
Practical Tasks				6	18	21	25	23	**93**	**59.24**	**1**
Practical Exams				6	8	17	1	21	**53**	**33.76**	**2**
Oral / Written Test				4	-	1	1	1	**7**	**4.46**	**3**
Direct Observations				-	3	-	-	1	**4**	**2.55**	**4**
Total				16	29	39	27	46	**157**	**100**	

The summary of distribution of Assessment Tasks (AT) along lecture and laboratory can be gleamed in table 3. The table denotes that there were seven (7) types of assessments / activities that were utilized by course facilitators and had garnered a total repetition of 322 times. This means that there were the most used activities in the classroom. Notably, it can be noted that the exam – oral /written (57.45%), recitation (13.66%) and quiz (12.11) have garnered the three top spots among the activities. This means that the paper – pencil test still dominates the means of assessment of student learning. This further indicates that only the cognitive aspect is being measured. Hence, this type of examination only routes to memorization which is not good study habits. This also corroborates the findings along the creation of the Intended Learning Objectives (ILO) that most of it were crafted along Low Order Thinking Skills (LOTS). Activities like performance, research papers and essay

which pertains to Higher Order Thinking Skills (HOTS) were seen to be utilized the least as seen in the ranking. This means that these activities were not utilized inadvertently when in fact this really measures student learning because this focus on the application of what the student were able to understand and applying it practically. Hence, varieties of student activities and not just traditional ones could also be introduced to students. Sakir and Kim (2020) emphasizes that PBL can be used to increase content knowledge while developing communication, collaboration, critical thinking, problem solving, and self-directed learning skill at the same time. The data show that PBL implementation improves students' learning activities and outcomes. Hence, this could also be used.

Furthermore, the table also shows the activities that are undertaken in the laboratory. The table revels that there were four (4) types of activities and was repeated for 157 times. This means that such activities were only activities that are being undertaken in the classroom. Hence, its fewness is to little considering that there were lots of activation that could be utilized. Interestingly, Practical Tasks (59.42%) and Practical Exams (33.76%) were the activities that were most utilized. It terms of its appropriateness, such can be seen to be apt in the courses. The practical applications of theories learned and from direct observations really will measure that is supposed to be measured. Hence, its fewness really limits the student learning. Adaption of numerous laboratory activities is can be undertaken. Kandamby (2019) suggested that: In order to make the practical effective, it is suggested to add an additional activity as a formative assessment based on theory and calculation which has to be conducted in the classroom once the practical is over, with students' active participation and facilitation of the instructor. If it is necessary to memorize any information well, engage in deep level processing which would involve asking as many questions related to the information as possible, considering its meaning and examining its relationships to the facts you already know.

Table 4
The summary distribution of types of Summative Exam along the BYVTED courses

Domain / Type	GE	PrE	TVT	AT	ET	ETC	FSM	GFD	Σ TL	%	Rank
Enumeration	4	6	1	2	3	2	5	3	26	6.63	6
Essay	8	7	3	-	9	4	9	5	45	11.48	3
Fill in Blanks	8	-	1	-	4	1	1	-	15	3.83	8
Identification	10	32	8	2	19	-	11	4	86	21.94	2
Multiple Choice	46	-	17	4	14	22	4	-	107	27.30	1
Matching Type	6	-	3	4	4	4	1	-	22	5.61	7
Practicum	4	2	0	2	2	9	12	6	37	9.44	5
True/False	5	2	-	-	-	-	3	-	10	2.55	10
Drawing	-	-	-	-	10	4	-	-	14	3.57	9
Others	2	10	2	-	3	12	9	4	42	10.71	4
	Grand Total								407	100	

Legend:

GE – General Education	PrE – Professional Education	TVT – Technical Vocational Teacher Education
AT – Automotive Technology	ET – Electrical Technology	ETC – Electronics Technology
FSM – Food and Service Management	GFD – Garments, Fashion and Design	TL - Total

Table 4 shows the summary distribution of types of summative Exam along the Bachelor of Technical – Vocational Teacher Education (BTVTED) courses with the inclusion of the following: General Education, Professional Eduation, Technical Vocation Teacher Education, Automotive Technology, Electrical Technology, Electronics Technology, Foods and Service Management The summary distribution of types of Summative Exam along the BYVTED coursesand Garments, Fashion and Design. It can be seen from the table that there four hundred and seven (407) items which emanated from among the ten (10) types of summative examination administered by course facilitators in their respective subjects handled.

Specifically, the highest frequencies were registered along: multiple choice (107, 27.30%), identification (86, 21.94); essay (45, 11.48%) and others (42, 10.71%). It can gleaned from the result that most of the items were lifted from the multiple choice type of examination which falls under the remembering domain and so with the identification type. These type of examination only allows students to recall facts and ideas or concepts.

However, it is interesting to note that the other types of the examination includes the creation of a Venn diagram, problem solving, translation, sketching, completing tables, analysis and practicum. Notably, these types had fallen under creating, evaluating and analyzing which were categorized as HOTS domains. Also, these other types were innovative because it is a diversion from the traditional paper and pencil test type of examinations, which is a good thing.

On the other hand, the lowest items were registered along: fill in the blanks (15, 3.83%); drawing (14, 3.57) and True or False (10, 2.55%). The drawing type can be categorized to be either application nor creating depending on how it was asked as a test item. As seen from the documents submitted, the test item for the drawing question is the creation of an "electrical wiring diagram" and a "block diagram" for electrical and electronics, respectively. It is hoped that there should be more like this is the test examinations, as this measures the abilities of students in the application of theories and concepts, learned. It is but there were only a few items which were crafted and given as test items. Hence, the presence of the items under the LOTS category and little on the HOTS category is a manifestation that course facilitators are coming up with students who are merely memorizers instead of doers. This is even evident on the number of items that were manifested on the applying domain in which this supposed to be seen in the courses with laboratory subjects, however, too few. Skills development is the ultimate aim of a Technical – Vocational program; and should course facilitators aims of achieving this goal, then it is imperative that learning activities (laboratory activities) and formative and summative examinations should include the application of theories into practice to bridge the gap of the two; also, innovation of how remembering questions items should be rephrased to fall under other categories, as well. Furthermore, the program aims in producing teachers who are supposed to be skills in terms of Technical – Vocational competencies, then it is imperative that course facilitators should focus on this aim with the development of their pedagogical skills also.

4. Conclusions and Recommendations

From the results and discussions of the study, the following conclusions and recommendations are presented: Majority of the verbs used in stating the Intended Learning Objectives (ILO) belongs the Lower Order Thinking Skills (LOTS) category; the limited number of learning activities cited by Instructors as evident from the syllabus; and General Education, Professional Education and Technical Vocational Teacher Education subjects offers varieties of assessment tasks while the five (5) areas of specialization offers and utilizes only a handful number of assessment tasks. The use of Lower Order Thinking Skills (LOTS) verbs in the learning objectives on along the courses: General Education, Professional Education, Technical Vocational Teacher Education and areas of specializations; will not stimulate learner's critical thinking and will only have to remain recalling and memorizing facts; also neglecting the development of skills needed in the program.

Course Facilitators may change the verbs they used in writing their objectives from LOTS to HOTS to manifest not only on recalling and memorizing but to develop critical thinking skills and competencies appropriate to the course and to the program, as well.

Majority of the non – specialization courses conducts summative exams that belongs to middle and high order thinking skills while majority of the specialization subjects conducts examination that only measures the cognitive domain and not the psychomotor domain; and most belong to the lower order thinking skill; and traditional paper and pencil types of examinations / test items were furnished test types. The absence of skills oriented and driven assessments in the areas of specialization forfeits the purpose of the program considering that programs offered in the campus are all technical courses that should develop skills; while the traditional paper and pencil types of activities and examinations does not develop other skills, as well. Course Facilitators especially in the areas of specialization courses may focus on practical / performance assessment that will further enhance the skills of students that is needed in the course or in the program; and may upgrade their formative and summative assessment by innovating contents that will make learning not a tedious tasks but an enjoyable and fun way, as well.

Almost of all of the courses analyzed were not aligned in the four (4) variables used, presented in the two documents which were the Syllabus and the TOS and TQs, respectively. The non-alignment of the variables used in the courses in the documents analyzed leads to the none achievement of the intended learning outcomes; and in the larger scale, the course outcomes; which leads to the forfeiture of achieving a goal of the program; Considering that all the variables in alignment has already been identified, a careful selection and utilization of objectives, learning activities, assessments tasks and summative assessments should be looked into by basing it on the backwards design model created as one of the result of the study.

An activity called "Project Well Re-Structured Instruction Through Enhancement Sessions (WRITE)" was conceptualized and develop. The "Project Well Re-Structured Instruction Through Enhancement Sessions (WRITE)" may enhance the competencies of teachers especially in writing verbs and creating formative and summative assessments that belongs to the Higher Order Thinking Skills (HOTS). Adoption and trial implementation of the Project WRITE may be done to enhance the knowledge of Course Facilitators in writing documents which were submitted in a semester basis.

5. Bibliography

Adekoya, Y. M. & Olatoye R. A. (2011). Effect of Demonstration, Peer-Tutoring, and Lecture Teaching Strategies on Senior Secondary School Students' Achievement in an Aspect of Agricultural Science. *The Pacific Journal of Science and Technology*, 12, pp. 320-332.

Amrein-Beardsley A, Osborn Popp SE. *Peer observations among faculty in a college of education: Investigating the summative and formative uses of the reformed teaching observation protocol (RTOP).* Educ Assess Eval Acc 24: 5–24, 2012. [Google Scholar]

Anderson, L.W. & Krathwohl, D. R. (Eds.). (2001). *A taxonomy for learning, teaching and assessing: revision of Bloom's taxonomy of educational objectives.* New York: Addison Welsey Longman.

Biggs, J. (2014). *Constructive alignment in university teaching*. HERDSA Review of Higher Education, 1, 5-22.

Biggs, J. B., & Collis, K. F. (1982). *Evaluating the quality of learning: The SOLO taxonomy*. Academic Press.

Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, E. J., & Krathwohl, D. R. (Eds.). (1956). *Taxonomy of educational objectives: The classification of educational goals*. New York, NY: Longmans, Green and Co.

Chase, C.I. (1999). *Contemporary assessment for educator*s. New York:

CHED Memorandum Order (CMO)79. (2017). Polices, Standards and Guidelines for the Bachelor of Technical – Vocational Teacher Education (BTVTED). Commission on Higher Education, Philippines.

Dick, W., Carey, L., & Carey, J.O., (2001). The Systematic Design of Instruction. 5th Edition. New York: Longman.

Elliott, V. (2018). Thinking about the Coding Process in Qualitative Analysis. *The Qualitative Report. Vol. 23. 11*. University of Oxford. USA

Fremi, J. (2017, November 10). *Writing learning outcomes and course objectives.* Retrieved June 14, 2023, from https://blogs.uis.edu/colrs/2017/07/13/writing-learning-outcomes-and-course-objectives/

Gronlund, N. E., & Brookhart, S. M. (2009). *Writing Instructional Objectives* (8th Edition). Upper Saddle River: Pearson Education Inc.

Hanna, G. S., & Dettmer, P. A. (2004). *Assessment for effective teaching: Using context-adaptive planning.* Boston, MA: Pearson A&B.

Iurea, C., Neacsu, I., Safta, C. G., & Suditu, M. (2011). The Study of the Relation between the Teaching Methods and the Learning Styles. The Impact upon Students' Academic Conduct. *Procedia-Social and Behavioral Sciences,* 11, 256-260.

Just Science Now! (n.d.). *Assessment-inquiry connection*. http:// www.justsciencenow.com/assessment/index.htm

Kalra, J. 2021. *Aligning Assessment with Learning Outcomes.* https://pressbooks.bccampus.ca/encourageacademicintegrity/chapter/aligning-assessment-with-learning-outcomes/

Keegan, D. (2013). *Theoretical Principles of Distance Education*. London: Routledge.

Kibga, E.S., Sentongo, J. &Gakuba, E. (2021). Effectiveness of Hands-On Activities to Develop Chemistry Learners' Curiosity in Community Secondary Schools in Tanzania. *Journal of Turkish Science Education*, 18(4), 605-621. DOI:10.36681/tused.2021.93. http://www.fused.org

Kofo. A. A., (2012). Laboratories and Sustainable Teaching and Learning About Senior SecondarySchool (SSS) Geography in Nigeria. *Journal of Educational and Social Research* Vol. 2 (4).

Krathwohl, D. R. (2002). *A revision of Bloom's taxonomy, an overview*. Theory into Practice (41)4, 212-219.

Kurt, S. 2020. *How Can We Align Learning Objectives, Instructional Strategies, and Assessments*? https://educationaltechnology.net/how-can-we-align-learning-objectives-instructional-strategies-and-assessments

Laboratory Experiences and Student Learning." National Research Council. 2006. *America's Lab Report: Investigations in High School Science. Washington, DC:* The National Academies Press.

Learning Objectives and Alignment. https://www.tacoma.uw.edu/digital-learning/learning-objectives-and-alignment.

Loughlin, C., Lygo-Baker, S., & Lindberg-Sand, Å. (2021). Reclaiming constructive alignment. *European Journal of Higher Education*, *11*(2), 119-136.

Lunenburg Fred C. (2011). Curriculum Development: Inductive Models. Sam Houston State University. Schooling Volume 2, Number 1.

Morningside College, *Assessment Handbook Advantages and Disadvantages of Various Assessment Methods* http://www.morningside.edu/academics/research/assessment/documents/advantagesdisadvantages.pdf

National Research Council, American Association for the Advancement of Science, National Science Teachers Association. *Next Generation Science Standards.* Washington, DC: National Academy, 2013.

Regeluth, C. M. (2013). *Instructional-design Theories and Models: A New Paradigm of Instructional Theory*. London: Routledge.

Ruge, G. Tokede, O. & Tivendale, L. (2019). Implementing constructive alignment in higher education – cross-institutional perspectives from Australia. *Higher Education Research & Development*, 38(4), 833-848. https://doi.org/10.1080/07294360.2019.1586842

Suthiwartnarueput, T. and P. Wasanasomsithi (2012). Effects of Using Facebook as a Medium for Discussions of English Grammar and Writing of Low-Intermediate EFL Students. *Electronic Journal of Foreign Language Teaching* 9(2), 194-214.

Tyler, R.W. (1949). *Basic principles of curriculum and instruction*. Chicago: University of Chicago Press.

Valenzuela, J. 2022. *A Simple Tool for Aligning Instruction and Assessment.* https://blog. citl.mun.ca

Zen, A. (2021). The Impact of Differentiated Learning Activities on Student Engagement and Motivation in the English Language Arts Classroom. *RED: A Repository of Digital Collections.* Thesis. Minnesota State University Moorhead. USA. Accessed through: https://red.mnstate.edu/cgi/viewcontent.cgi.article=1645 & context=thesis