



## INITIAL TRYOUT OF COGNITIVE LOAD INSTRUMENT

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### KeyWords

Cognitive Load, intrinsic load, extraneous load, germane load, knowledge, information, activities

### ABSTRACT

The theory of Cognitive Load has always been a major influence in the field of educational psychology (Skulmowski & Man Xu, 2021). Cognitive load theory pertains to the amount of information that a person's working memory can hold at a time. The cognitive load instrument consists of four to five items for each domain of cognitive load. Therefore, this study aims to try out initially the cognitive load instrument and determine the index of discrimination. The researchers conducted this study in Quezon City University during the 1st semester of the academic year 2024-2025. The general population of this study are students from Quezon City University, whereas the sample population includes 30 students from Bachelor of Early Childhood Education. After the pilot testing of the Cognitive Load Instrument, it has been determined that from the remaining thirteen (13) questions, only nine (9) will be used for the next tryout. Moreover, it was shown that the majority of the students have extraneous cognitive load.

## INTRODUCTION

Cognitive load theory has been a major influence for the field of educational psychology (Skulmowski and Man Xu, 2021). New fluctuating knowledge and intellectual tasks could result in difficulties. Cognitive load theory refers to the amount of information that an individual's working memory can contain or hold. Cognitive Load Theory or CLT consists of aspects of human cognitive architecture that are relevant to instruction along with the instructional consequences that flow from the architecture (Sweller, 1994). In other words, cognitive load mediates the effect from instructional designs on learning outcomes (Cierniak et al., 2009). This theory is composed of three identified types of load namely the intrinsic cognitive load, extraneous cognitive load, and germane cognitive load. Intrinsic cognitive load (ICL) pertains to the load imposed by the complexity of the learning task. The complexity is reflected in the element interactivity describing the learning task's inherent number of elements and their interrelations (Sweller, 2010). According to Sweller and Chandler (1994), a learning task could be classified on a continuum between low and high element interactivity depending on how much information needs to be processed simultaneously. Prior knowledge is deemed an important factor for the intrinsic cognitive load (Klepsch and Seufert, 2021). Moreover, intrinsic cognitive load (ICL) was also described by Sweller and Chandler as an idea that all instruction has natural difficulty or complexity associated with it. Intrinsic cognitive load is the challenge that naturally occurs whenever you are learning a new task. Reading a physics textbook with a great deal of new terminology takes much more cognitive effort than reading a novel written at a level intended for children to read.

Extraneous cognitive load or ECL is a cognitive load that causes an unnecessary increase in interactional elements to be processed by the learner, and it is a result of inappropriate instructional design (Paas & Sweller, 2014). ECL is imposed because of suboptimal instructional designs, which do not adequately facilitate learning (Sweller, 2010). This type of load is described as the unnecessary information processing, which is caused by the instructional design. ECL is considered to be detrimental or harmful for an individual who's learning, as it is not directed to schema acquisition. Another way to think of ECL is a distraction from intended learning. Some examples of extraneous load include people who tries to carry on a conversation while you are reading a book, working in a room that is uncomfortable, and listening to disorganized material that contains irrelevant information.

Germane cognitive load on the other hand is caused by instructional design, but unlike extraneous cognitive load, GCL is advantageous for learning, because it is directed to schema acquisition by directing learner's attention towards relevant learning processes that were triggered by the design (Sweller et al., 1998). This type of cognitive load results from activities required of a learner that facilitate learning and contribute to transfer performance, helping to build correct mental models (Paas et al., 2003). An example of GCL is creating diagrams and flowcharts to understand or perform various complex tasks. The systematic organization of GCL materials makes complex learning easier to understand and remember.

People have working memory wherein our brains retain or receive limited information. When performing challenging mental tasks such as comprehending a language, problem-solving, or reasoning, the brain processes known as working memory are activated (Baddeley, 1992). However, working memory can hit its limit when handling new and complex information. Therefore, people are thought to be capable of processing only a certain amount of information at once (Cowan, 2010; Miller, 1956). Furthermore, scientific evidence suggests that new information can only be stored in a person's working memory for a maximum of 20 to 30 seconds before being lost (Peterson and Peterson, 1959). NASA Task Load Index (TLX), which focuses on perceived workload, was created by Hart and Staveland (1988) in one of the first attempts to evaluate cognitive load in research and practice using subjective evaluations. It is used, for example, to measure the workload of nurses in intensive care units (Tubbs-Cooley et al., 2018) or pilots during simulated flight tasks (Mansikka et al., 2019) demonstrating the important role of this construct in human factors research.

Establishing a reliable and valid tool to assess cognitive load will contribute valuable insights into learning processes and inform better instructional design. Therefore, this study aims to try out initially the cognitive load instrument and determine the index of discrimination.

## MATERIALS AND METHODS

This section discusses the methods, the processes, and the materials that were used in the study. Key steps include identifying behavioral indicators for intrinsic, extraneous, and germane CL, constructing relevant items from existing literature, testing for

discrimination, and verifying its content validity through a panel of expert review, pilot testing, and analysis.

**Research Locale**

This study was conducted at Quezon City University San Bartolome Campus during the first semester of the academic year 2024-2025.

**Participants of the Study**

The participants of the study were 30 Bachelor of Early Childhood Students at Quezon City University, selected through convenient sampling.

**Research Design and Instrument**

This study employed a quantitative research design. Quantitative research design typically deals with the systematic investigation of social phenomena through statistical or numerical data (Watson, 2015). In this study, the researchers will utilize their researcher-made instrument or assessment tool, anchored in the Cognitive Load Theory by John Sweller entitled "Cognitive Load Instrument," which was validated by a number of experts in the previous study entitled, "Content Validity of Cognitive Load Instrument". The instrument was divided into four sections. The first section referred to the demographic profile of the respondents. The second, third, and fourth sections pertained to the intrinsic, extrinsic, and germane cognitive load that used a four point Likert scale with 1= strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree.

Scale	Verbal Interpretation	Abbreviation	Range
4	Strongly Agree	SA	4.00-3.00
3	Agree	A	2.99-2.00
2	Disagree	D	1.99-1.00
1	Strongly Disagree	SD	1.00-0.99

**A. Intrinsic Cognitive Load**

	Characteristics	4	3	2	1
1	I take a break every time I finish studying a specific topic before I proceed to another topic.				
2	I find it hard to catch up with multiple lessons/tasks (due to.. ex. Lack of knowledge/background)				
3	It is easier for me to build prior knowledge in mathematics because of self motivation .				
4	It is difficult to concentrate due to internal factors like lack of interest/lack of focus.				

B. Extraneous Cognitive Load

	<b>Characteristics</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>1</b>	I find it difficult to comprehend a concept when the teacher adds unnecessary information.				
<b>2</b>	A lesson is unclear to me when the teacher explains confusing content.				
<b>3</b>	It is easier for me to build a prior knowledge in mathematics through instructional strategy.				
<b>4</b>	Poor delivery of instructions affects my learning negatively.				
<b>5</b>	It is difficult to concentrate due to external factors like noise and discomfort.				

C. Germane Cognitive Load

	<b>Characteristics</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>1</b>	I create diagrams and flowcharts to perform complex tasks.				
<b>2</b>	I use video lectures with diverse forms of media, including both auditory and visual aspects for better understanding.				
<b>3</b>	I often engage in discussions, debates, or peer teaching to further explore and clarify concepts I encounter during my learning.				
<b>4</b>	I actively seek out additional resources, such as books, articles, or online materials, to gain a deeper understanding of topics I find interesting.				

Procedure

The researchers will be gathering data from Bachelor of Early Childhood students from Quezon City University. The researchers utilized their researcher-made instrument or assessment tool, which consist of four divided sections; first section referred to the demographic profiles of the participants, The second, third, and fourth sections pertained to the intrinsic, extrinsic, and germane cognitive load that used a four point Likert scale with 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree. A quantitative research design will be employed, and paper-based survey questionnaires will be distributed to the respondents, who are students.

Statement of the Problem

This study aims to determine the validity of cognitive load instrument by exploring the following:

1. Define Cognitive Load Theory and its components.
2. Test initially the cognitive load instrument.
3. Determine the index discrimination of the cognitive load instrument.

Results and Discussions

This section provides a clear overview and explanation for the results that were gathered during the time this study was conducted. The following tables below represent the collected data from the respondents, both from the previous and present research of the same authors.

In a previous research by Ugdiman et al. (2023) entitled “Content Validity of Cognitive Load Instrument”, the researchers crafted an instrument regarding the Cognitive Load Theory. Below are the tables from this research.

**Table 1. The Cognitive Load Instrument**

<p><b>A. Intrinsic Cognitive Load</b></p> <ol style="list-style-type: none"> <li>1. I am bothered by irrelevant information in the lesson in mathematics.</li> <li>2. I take a break every time I finish studying a specific topic before I proceed to another topic.</li> <li>3. I find it hard to catch up with multiple lessons/tasks (due to.. ex. Lack of knowledge/background).</li> <li>4. It is easier for me to build a prior knowledge in mathematics because of self motivation.</li> <li>5. It is difficult to concentrate due to internal factors like lack of interest/lack of focus.</li> </ol> <p><b>B. Extraneous Cognitive Load</b></p> <ol style="list-style-type: none"> <li>1. I find it difficult to comprehend a concept when the teacher adds unnecessary information</li> <li>2. A lesson is unclear to me when the teacher explains confusing content.</li> <li>3. It is easier for me to build a prior knowledge in mathematics through instructional strategy.</li> <li>4. Poor delivery of instructions affects my learning negatively.</li> <li>5. It is difficult to concentrate due to external factors like noise and discomfort.</li> </ol> <p><b>C. Germane Cognitive Load</b></p> <ol style="list-style-type: none"> <li>1. I create diagrams and flowcharts to perform complex tasks.</li> <li>2. I use video lectures with diverse forms of media, including both auditory and visual aspects for better understanding. I use video lectures with diverse forms of media, including both auditory and visual aspects for better understanding.</li> <li>3. I always obey instructions provided in a task to perform well.</li> <li>4. I often engage in discussions, debates, or peer teaching to further explore and clarify concepts I encounter during my learning</li> <li>5. I actively seek out additional resources, such as books, articles, or online materials, to gain a deeper understanding of topics I find interesting.</li> </ol>
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The table above shows the original fifteen (15) items in the constructed instrument. Each domain or component has five (5) items generated from review of various existing literature in relation to the Cognitive Load Theory.

**Table 2. Content Validity Index (CVI) of the Cognitive Load Instrument**

A. Intrinsic Cognitive Load							
Item	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	CVI	Interpretation
1	2	4	3	4	2	3/5= 0.60	Rejected
2	4	4	3	4	4	5/5= 1.00	Accepted
3	4	4	3	4	4	5/5= 1.00	Accepted
4	4	4	3	4	4	5/5= 1.00	Accepted
5	4	4	3	4	3	5/5= 1.00	Accepted
B. Extraneous Cognitive Load							
Item	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	CVI	Interpretation
1	3	4	4	4	3	5/5= 1.00	Accepted
2	4	4	4	4	4	5/5= 1.00	Accepted
3	4	4	4	4	4	5/5= 1.00	Accepted
4	4	4	4	4	4	5/5= 1.00	Accepted
5	4	4	4	4	4	5/5= 1.00	Accepted
C. Germane Cognitive Load							
Item	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	CVI	Interpretation
1	4	4	3	4	4	5/5= 1.00	Accepted
2	4	4	3	4	4	5/5= 1.00	Accepted
3	2	4	3	4	4	4/5= 0.80	Rejected
4	4	4	3	4	4	5/5= 1.00	Accepted
5	4	4	3	4	4	5/5= 1.00	Accepted

For **A. Intrinsic Cognitive Load (ICL)**, numbers 2, 3, 4, and 5 show that these items reflect intrinsic cognitive load accurately. However, item number 1 was rejected, as it only gained a CVI= 0.60 from the selected panel of experts. For **B. Extraneous Load (ECL)**, all items from 1 to 5 were accepted as they had CVI of 1.00 and therefore it reflected extraneous cognitive load. For **C. Germane Cognitive Load (GCL)**, It was determined that items 1, 2, 4, and 5 (CVI = 1.00) all represent germane cognitive load. On the other hand, item 3 was rejected because it only had a CVI of 0.80. Experts may not have been in strong agreement about whether this item truly reflects germane cognitive load.

Additionally, the S-CVI for the universal agreement is equivalent to 0.87 which indicates that it met the content validity standard of 0.80 for the S-CVI (universal agreement). On the other hand, S-CVI (average) is equivalent to 0.96. This only suggests that the cognitive load instrument reached the content validity standard of 0.90 for the S-CVI (average).

**Table 3. Content Validity Ratio (CVR) of Cognitive Load Instrument**

<b>A. Intrinsic Cognitive Load</b>								
Item	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Ne	CVR	Interpretation
1	2	3	3	3	2	3	0.200	Remove
2	3	3	3	3	3	5	1.000	Retain
3	3	3	3	3	3	5	1.000	Retain
4	3	3	3	3	3	5	1.000	Retain
5	3	3	3	3	3	5	1.000	Retain
<b>B. Extraneous Cognitive Load</b>								
Item	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Ne	CVR	Interpretation
1	3	3	3	3	3	5	1.000	Retain
2	3	3	3	3	3	5	1.000	Retain
3	3	3	3	3	3	5	1.000	Retain
4	3	3	3	3	3	5	1.000	Retain
5	3	3	3	3	3	5	1.000	Retain
<b>C. Germane Cognitive Load</b>								
Item	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Ne	CVR	Interpretation
1	3	3	3	3	3	5	1.000	Retain
2	3	3	3	3	3	5	1.000	Retain
3	2	3	3	3	3	4	0.600	Remove
4	3	3	3	3	3	5	1.000	Retain
5	3	3	3	3	3	5	1.000	Retain

For **A. Intrinsic Cognitive Load**, only four items were retained. Items 2 to 5 got CVR=1.000 and therefore, retained in the instrument. Whereas, Item 1 was interpreted as removed, as it only gained CVR=0.200. For **B. Extraneous Cognitive Load**, all items from 1 to 5 got CVR=1.000 and were retained. And for **C. Germane Cognitive Load**, item 3 (CVR=0.600) was removed for not meeting the standard CVR to retain in the cognitive load instrument.

**Table 4. Retained Items in Cognitive Load Instrument**

<p><b>A. Intrinsic Cognitive Load</b></p> <ol style="list-style-type: none"> <li>1. I take a break every time I finish studying a specific topic before I proceed to another topic.</li> <li>2. I find it hard to catch up with multiple lessons/tasks (due to.. ex. Lack of knowledge/background).</li> <li>3. It is easier for me to build a prior knowledge in mathematics because of self motivation.</li> <li>4. It is difficult to concentrate due to internal factors like lack of interest/lack of focus.</li> </ol> <p><b>B. Extraneous Cognitive Load</b></p> <ol style="list-style-type: none"> <li>1. I find it difficult to comprehend a concept when the teacher adds unnecessary information</li> <li>2. A lesson is unclear to me when the teacher explains confusing content.</li> <li>3. It is easier for me to build a prior knowledge in mathematics through instructional strategy.</li> <li>4. Poor delivery of instructions affects my learning negatively.</li> <li>5. It is difficult to concentrate due to external factors like noise and discomfort.</li> </ol> <p><b>C. Germane Cognitive Load</b></p> <ol style="list-style-type: none"> <li>1. I create diagrams and flowcharts to perform complex tasks.</li> <li>2. I use video lectures with diverse forms of media, including both auditory and visual aspects for better understanding. I use video lectures with diverse forms of media, including both auditory and visual aspects for better understanding.</li> <li>3. I often engage in discussions, debates, or peer teaching to further explore and clarify concepts I encounter during my learning</li> <li>4. I actively seek out additional resources, such as books, articles, or online materials, to gain a deeper understanding of topics I find interesting.</li> </ol>
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Previously, the content validity of this instrument was established by Ugdiman et al. (2023). Of the fifteen (15) original items generated from the existing related literature about the Cognitive Load Theory, there were thirteen (13) items that were retained.

One item from the intrinsic cognitive load was removed based on the CVI of 0.60. Another item from the germane cognitive load was removed based on the CVI of 0.80 according to the experts. On the other hand, none of the items in the extraneous cognitive load were removed, as they all had a CVI of 1.00.

**Table 5. Respondents' Demographic Profile**

**A. Year Level**

Year Level	frequency	Percentage
1st	2	6.67%
2nd	0	0%
3rd	28	93.33%

Majority or 28 of the 30 respondents were 3rd year (93.33%) Bachelor of Early Childhood students at Quezon City University. There were 2 respondents from the 1st year (6.67%) and there is none from the 2nd year (0%).

**B. Sex**

Sex	frequency	Percentage
Male	7	23%
Female	23	77%

There were more female respondents (23) than male respondents (7) in the study. Female respondents make up 77% of the population while male respondents make up the remaining 7% of the population.

**C. Age**

Age	frequency	Percentage
18-20	21	70%
21-22	6	20%
23-25	3	10%

21 of the respondents (70%) were students from the age group of 18-20 years old. 6 respondents (20%) belong to the age group of 21-22 and 3 of the respondents (10%) were 23-25 years old.

**Table 6. Cronbach's Alpha Value Interpretation (Hair et al. 2010)**

Cronbach's Alpha Coefficient	Interpretation
0.0-0.20	Less Reliable
0.21-0.40	Rather Reliable
0.41-0.60	Quite Reliable
0.61-0.80	Reliable
0.81-1.00	Very Reliable

The table above represents the interpretation for every value of Cronbach’s Alpha according to Hair et al. (2010). Very reliable means that the measurement is highly precise and accurate. Reliable being consistently producing the same results even under similar conditions. Quite reliable indicates consistent production of similar results or outcomes. Rather reliable which means minimizing the subjectivity and aiming for revision or replication. And less reliable which means producing results that are not consistent and could be influenced by chance factors.

**Table 7. Cronbach’s Alpha for Intrinsic Cognitive Load Domain**

Scale Reliability Statistics	
	Cronbach's $\alpha$
<b>scale</b>	0.554

Item Reliability Statistics			
	<b>Mean</b>	<b>SD</b>	<b><u>If item dropped</u> Cronbach’s <math>\alpha</math></b>
IL2	3.17	0.592	0.429
IL3	2.63	0.765	0.595
IL4	3.27	0.640	0.346

The overall Cronbach’s Alpha score for the intrinsic cognitive load domain is equivalent to 0.554, which indicates that it is quite reliable meaning, it can give similar results consistently. Internal consistency of the items in the ICL ranges from 0.346-0.595, which means that it could range from being rather reliable by minimizing subjectivity and aiming for replication to quite reliable according to Hair’s interpretation table of Cronbach’s Alpha.

**Table 8. Cronbach’s Alpha for Extraneous Cognitive Load Domain**

Scale Reliability Statistics	
	Cronbach's $\alpha$
<b>scale</b>	0.615

Item Reliability Statistics			
	<b>Mean</b>	<b>SD</b>	<b><u>If item dropped</u> Cronbach's <math>\alpha</math></b>
EL1	3.17	0.699	0.468
EL2	3.50	0.630	0.622
EL3	3.23	0.679	0.560
EL4	3.70	0.466	0.580
EL5	3.73	0.521	0.550

The reliability of the extraneous cognitive load (ECL) is 0.615 and interpreted as reliable. This only indicates that it can produce similar results under similar conditions. Internal consistency of the items in ECL range from 0.468 to 0.622 and could be interpreted as quite reliable to reliable.

**Table 9. Cronbach's Alpha for Germane Cognitive Load Domain**

Scale Reliability Statistics	
	Cronbach's $\alpha$
<b>scale</b>	0.724

Item Reliability Statistics			
	Mean	SD	<u>If item dropped</u> Cronbach's $\alpha$
GL3	3.10	0.662	0.577
GL4	3.30	0.651	0.559

For the germane CL domain, the scale was 0.724, and when interpreted according to the table of interpretation is reliable. The two remaining items under the GCL category had a value of 0.559 and 0.557. This denotes that they are both quite reliable and produce similar results consistently.

**Table 10. Validity of Cognitive Load Instrument**

Scale Reliability Statistics	
	Cronbach's $\alpha$
<b>scale</b>	0.754

Item Reliability Statistics	
	<u>If item dropped</u> Cronbach's $\alpha$
IL2	0.725
IL3	0.739
IL4	0.710
EL1	0.712
EL2	0.734
EL3	0.759
EL4	0.741
EL5	0.748
GL3	0.744
GL4	0.723

After Cronbach's Alpha, it has been determined that from the thirteen remaining items in the instrument after undergoing content validity, only nine items were now retained. From the ICL, items 2, 3, and 4 were retained. From the ECL, none of the items were removed. And from the GCL, only item numbers 3 and 4 were retained. Through the essence of internal consistency, the removed items from the intrinsic and germane CL domains are revealed to not be consistent with the cognitive load instrument after the pilot testing.

**Table 11. Levels of Cognitive Load of the Students**

<b>Cognitive Load</b>	<b>frequency</b>	<b>Percentage</b>	<b>Mean</b>
Intrinsic Cognitive Load	7	23.33%	3.17
Extraneous Cognitive Load	17	56.67%	3.47
Germane Cognitive Load	6	20%	3.1
<b>Overall</b>	<b>30</b>	<b>100%</b>	

The table above shows the levels of cognitive load of the 30 students who participated in the pilot testing of the instrument. 17 out of 30 of respondents fall under the extraneous CL, which is equivalent to 56.67% and a mean of 3.47. 7 students fall under the intrinsic CL, which is equivalent to 23.33% and a mean of 3.17. On the other, 6 students or 20% with a mean of 3.1 are in the germane CL.

*Table 12. Levels of Cognitive Load*

<b>Level/Range</b>	<b>Interpretation</b>
3.26-4.00	High
2.26-3.25	Moderately High
1.76-2.25	Moderately Low
1.00-1.75	Low

The table above denotes the level or range of the cognitive load. High (3.26-4.00) shows a great significant presence of what is being measured. Moderately high (2.26-3.25) connotes a noticeable presence of what is being measured. Moderately low (1.76-2.25) there is a presence however, not as strong. Low (1.00-1.75) means there is only a low or minimal presence of what is being measured.

*Table 13. Levels of Intrinsic Cognitive Load*

Level	frequency	Percentage
High	8	26.67%
Moderately High	22	73.33%
Moderately Low	0	0%
Low	0	0%
<b>Overall</b>	<b>30</b>	<b>100%</b>

Table 13 shows the levels of intrinsic load of the students. Each range or level is associated with frequencies based on the students' level of intrinsic CL. 8 students (26.67%) have high levels of ICL. 22 students (73.33%) have moderately high levels of ICL. On the other hand, none of the students has moderately low or low levels of ICL.

*Table 14. Levels of Extraneous Cognitive Load*

Level	frequency	Percentage
High	18	60%
Moderately High	12	40%
Moderately Low	0	0%
Low	0	0%
<b>Overall</b>	<b>30</b>	<b>100%</b>

Table 14 shows that 18 students (60%) have high levels of ECL, 12 students (40%) have moderately high levels of ECL while none of the student respondents have either moderately low or low levels of ECL.

*Table 15. Levels of Germane Cognitive Load*

Level	frequency	Percentage
High	8	26.67%
Moderately High	21	70%
Moderately Low	1	3.33%
Low	0	0%
<b>Overall</b>	<b>30</b>	<b>100%</b>

Table 15 depicts the levels of GCL of the students. 21 students or 70% of them have moderately high levels of GCL, which takes up the majority of the population, and 8 students or 26.67% of the students have significantly high levels of GCL. Only 1

respondent (3.33%) has moderately low levels of GCL.

## Conclusion

After the pilot testing of the Cognitive Load Instrument, it has been determined that from the remaining thirteen (13) questions, only nine (9) will be used for the next tryout of the instrument to further determine its validity. The levels of cognitive load of the college students taking up Bachelor of Early Childhood Education at Quezon City University who participated in the pilot testing were also determined. This study shows that a huge percentage of the students have extraneous cognitive load, which pertains to the unnecessary processing of information caused by the instructional design itself, followed by intrinsic and germane cognitive load.

Moreover, this study was only limited to thirty BECED students of Quezon City University. The researchers highly recommend testing this cognitive load instrument on a larger group, either within or outside of Quezon City University.

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