

# ANALYSIS OF THE HUMANISTIC THEORY OF MOTIVATION IN LEARNING A-LEVEL CHEMISTRY

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## **Abstract**

*This paper reports findings from a study conducted using 360 students offering a-level chemistry in Uganda about aspects of motivation that can enhance effective learning of chemistry. It was found out that students desired to be self-actualized and were motivated by a teaching environment characterized by an emphasis on the benefits of chemistry. The opinions of students regarding how they should be motivated are given. The gaps in motivating learners studying a-level chemistry as possible causes for poor performance are revealed. The relationship between motivation and performance in a-level chemistry is determined. Recommendations for improving the teaching of a-level chemistry are highlighted.*

**Keywords:** *Humanistic Theory, Motivation, Chemistry*

## **Introduction**

Learners come to the classroom with certain needs and expectations which they hope to fulfill. They usually want to make progress in their academic work and perform tasks well. Usually they believe that the schools will help them to meet those goals. A-level chemistry students in particular are projecting into the future at the possible courses they are to offer at tertiary level leading them to their desired future jobs. These students therefore are usually ready to learn and excel in chemistry. However, performance in chemistry at A-level in Uganda is still wanting. Many factors can be attributed to the persistently low grades in A-level chemistry and motivation is one of them.

## **The Concept of Motivation for Learners of A-level Chemistry**

Pinnington and Edwards (2000) discussed that it is motivation which deals with choices regarding what people will and will not do and also the intensity or effort people put into the activities they choose to perform. Indeed, Walklin (2002) said that if the learners can see some personal gain at the end of the course and the content is relevant to their individual lives, the teacher starts with an advantage.

Motivation is one of the key variables in students' learning processes. The motivational elements include learning self-concept, control, learning goals, interest in learning, external enticements and relevance assigned to

knowledge. Motivation can be extrinsic or intrinsic: Extrinsically students are motivated to learn for grades, to elicit praise, to avoid punishment, or for purposes of social acceptance while intrinsically students are motivated to learn for mastery and knowledge. Self-actualization theory of motivation stresses the idea that an individual has the desire to fulfil one's individual needs. People have strong cognitive reasons to perform various actions and have a need for creative self-expression and self-fulfilment. The question is how far do students feel self-actualized while learning A-level chemistry?

### Opinions of Students regarding A-Level Chemistry

In a study carried out in Ugandan secondary schools that offer A-level chemistry, only 28% of the students reported that their most interesting subject was chemistry. This indicates that many students were taking chemistry as a requirement in their combination but not because they were interested in it. Many students confessed that chemistry was a vital subject in the courses they later wanted to pursue at tertiary level. However, Walklin (2002) echoed that there is no such a thing on earth as an uninteresting subject; the only thing that can exist is an uninterested person. This therefore would call for a lot of motivation to sustain perseverance with the subject.

In Uganda the students taking A-level chemistry have no choice in many situations of learning. For example the curriculum and the facilities in the schools are not determined by students. These aspects may not be meeting the needs of the students using them. Below are some of the responses that students gave regarding A-level chemistry.

*Table 1: Opinions of Students regarding A-Level Chemistry*

	<i>Agree</i>	<i>Disagree</i>	<i>Not Sure</i>	<i>Total</i>
Relevancy of Chemistry to the Needs of Uganda	304	20	36	360
Opinion on whether Chemistry Curriculum Meets Needs of Uganda	201	139	20	360
Job Value of Chemistry in Society	319	22	19	360
Relevancy of Chemistry to school Curriculum	335	13	12	360

From the table above most of the students acknowledged the relevance and job of chemistry to the needs of Uganda today. They supported their views by saying that more chemists were needed in pharmaceutical industries, chemistry could ease scientific advancement and research and was also needed in petroleum industries and manufacturing industries. It is therefore important that teachers underline the long term and short term purposes of learning A-level chemistry. Petty (2001) asserted that without a long term goal for their studies, students become demotivated.

What happens in most of the secondary schools in Uganda is that A-level students are taken to be mature and with a good knowledge of what they are doing. Their needs are not catered for specifically instead it's the demands of the schools, teachers, UNEB and sometimes parents. This usually affects their interest in the subject as reflected in the table below:

**Table 2** *Chemistry Lessons were Interesting*

<i>Chemistry lessons being interesting</i>	<i>Frequency</i>	<i>Percent</i>
Strongly agree	63	17
Agree	94	26
Disagree	193	54
Strongly disagree	10	3
Total	360	100

These findings reveal that many students never enjoyed the chemistry lessons. However, they expressed a strong desire to have practicals in chemistry. Rana (2000) said that teachers should recognize that for many students, the learning of mathematics and science involves feelings of severe anxiety and fear of failure. They should assure students that they understand the problem and will work with them to overcome it.

### **How A-level Chemistry students are self-actualized**

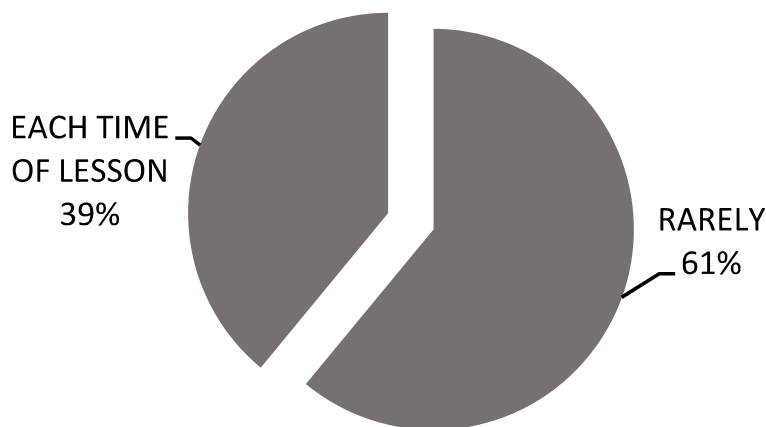
#### *a) Problem solving in chemistry*

The needs of chemistry students basically lie in a desire to perform excellently in the subject and most of them reported that they were given monthly tests however very few chemistry teachers corrected them. Fig 1 reveals that many chemistry teachers did not encourage students in problem solving which left the students to look for questions by themselves and this may not be topical. 39% of the students said that they were having exercises in chemistry each time of the lesson while 61% of them rarely had

exercises (see figure 1 below). Moreover teaching A-level chemistry using illustrations of worked-out examples to show the learners how to solve problems is not only desired by students but can as well be an important approach in an instructional sequence. The teacher should therefore provide a framework of questioning within which desired responses may occur. These can be exercises and assignments which can only be done better if the teacher first demonstrates with similar illustrations.

Figure 1 Frequency of Doing Exercises in Chemistry

**PIE CHART SHOWING FREQUENCY OF DOING CHEMISTRY EXERCISES**



*b) Receiving Feedback from Teachers*

Consequently, students need an immediate feedback from their teachers in order to consolidate what is correct and discard what is wrong. This way they can seek the correct answers in good time. However, most students in this study reported that their teachers never corrected the assignments and exercises(See Table 3).

**Table 3** *Chemistry Teachers Corrected the Assignments and Exercises*

<i>Responses</i>	<i>Respondents</i>	<i>Percent</i>	<i>Cumulative percent</i>
Strongly agree	70	19	19
Agree	45	13	32
Disagree	152	42	55
Strongly disagree	93	26	100
Total	360	100.0	

c) *Relating Chemistry to Real World*

In this study, only 56% of the students reported that their teachers were interesting when teaching chemistry while only 55% of the students were in agreement with the statement that teachers of A-level chemistry related chemistry to everyday life. Students are often motivated when chemistry is related to the work situation or real world, and by indicating the benefit to the students of successfully mastering the subject.

d) *Maintaining a good teacher-student relationship*

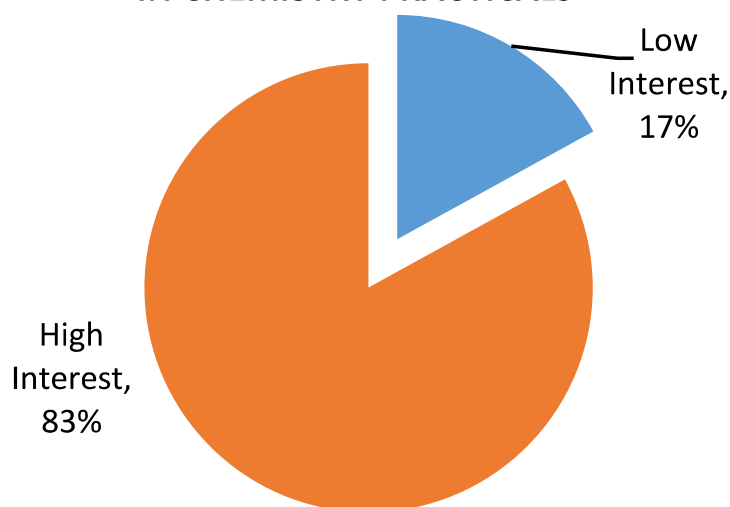
Similarly, A-level chemistry students desire to have a good relationship with their teachers whom they wish to be committed in assisting them to achieve the desired academic goal. Jarvis (2005) submitted that the major element of good teaching is the establishment of a good teacher-learner relationship. In addition, these students desire to have teachers who are knowledgeable, interested in teaching, available for consultations and who teach chemistry with enthusiasm.

e) *Learning Chemistry Practically*

The students also expressed a great desire to have chemistry practicals integrated in their lessons. They wanted to experience what the teachers taught but most teachers taught chemistry theoretically. Most students displayed a high interest in chemistry practicals as shown in Figure 2.

*Figure 2: Interest of A-level students in chemistry practicals*

**PIE CHART SHOWING INTEREST OF A'LEVEL STUDENTS  
IN CHEMISTRY PRACTICALS**



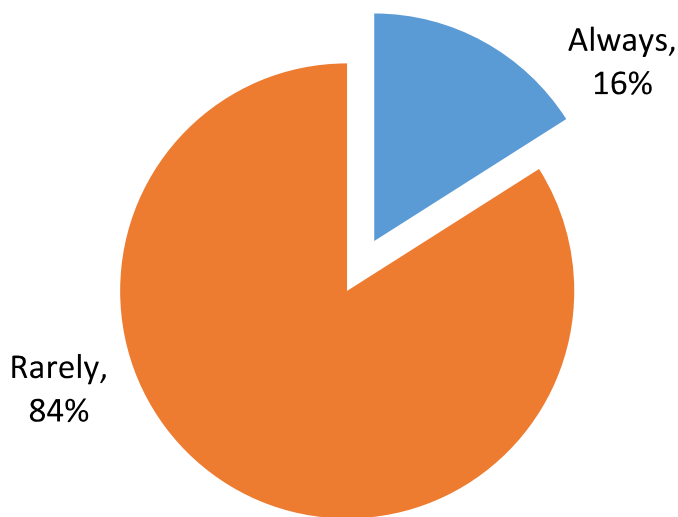
Other methods that involve learning chemistry practically involve discovery method, field tours and project method of learning. However, most schools do not have practicals integrated in their lessons.

*f) Use of Seminars in Learning A-level Chemistry*

Students expressed a great desire to have more seminars in chemistry. Seminar method is a teaching method that enhances a wide coverage of content through question approach. It is usually a good method that helps students on question approach. Students are usually given opportunity to present their solutions before their teachers contribute. Many times experts in the subject, usually experienced examiners, are invited to facilitate in these seminars which enhances team teaching. In this study the majority (84%) of the Head Teachers reported that the chemistry departments rarely organized chemistry seminars. Only 16% of them reported that chemistry departments organized chemistry seminars as reflected in the pie chart below (Figure 3). The commonest practice was that seminars were organized towards UNEB exams which offered little exposure and experience because of time. However, Petty (2001) construed that different teaching methods develop different skills in the learner. As such the seminar method encourages group work and thus develops the skills of discussion, persuasion and working with others.

*Figure 3 Frequency of Organizing Seminars by Chemistry Departments*

**PIE CHART SHOWING FREQUENCY OF ORGANIZING SEMINARS BY CHEMISTRY DEPARTMENTS**



*g) Use of Computers in Learning A-level Chemistry*

Different teaching methods develop different skills in the learners. Teacher talk develops the skill of listening attentively, and group work develops the skills of discussion, persuasion and working with others.

Independent learning on the other hand develops the skill of learning how to learn. Notably, students love using computers and many students can benefit from the intelligible interactive content on computers.

*h) Use of Discovery Method*

Additionally, the researcher carried out a further analysis to establish whether motivation had a significant effect on the performance of students in A- level chemistry. This analysis was guided by the following hypotheses:

- i) Ho. Performance in A-level chemistry does not depend on motivation*
- ii) Ha. Performance in A-level chemistry depends on motivation*

**Table 4: Chi-square Tests**

<b>Chi-Square Tests</b>			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	25.045 <sup>a</sup>	12	.015
Likelihood Ratio	15.878	12	.197
Linear-by-Linear Association	.579	1	.447
N of Valid Cases	317		

a. 13 cells (61.9%) have expected count less than 5. The minimum expected count is .01.

The above chi-square test showed a p-value of  $0.015 < 0.05$ , this is significant at 5% level of significance. Thus there is sufficient evidence to reject the null hypothesis; we thus conclude that performance in A-level chemistry depends on motivation.

**Conclusions and Implications**

Chemistry was viewed as a relevant subject by students of A-level and that it was relevant to the current needs of Uganda.

Very few students were having exercises in chemistry each time of the lesson, yet exercises in chemistry help to enhance learning through practice and discovery.

According to the students, learning A-level chemistry is not self-fulfilling because students are not given opportunity to act on the environment on purpose.

Students can learn A-level chemistry effectively when their needs are fulfilled and when they are allowed to make choices. These students are self-determined and can be creative.

Students desire their teachers to motivate them in the following ways including; relating A-level chemistry to the real world, making corrections of previous tests, organizing practical lessons and organizing chemistry seminars.

### **Recommendations**

There is need for teachers to improve the evaluation strategies of A-level chemistry. Small practical tasks could be given which can be evaluated by the teachers and immediate feedback be given. The chemistry teachers should be encouraged to give exercises to students more frequently to enhance learning of chemistry. The Head Teachers could be tasked to ensure that this happens in their respective schools. In addition, the given exercises should be corrected so that students can identify correct answers to questions and hence avoid repeating mistakes.

Teachers should use more practical approach in teaching A-level chemistry and relate theory to practical. Students need more exposure and practice in chemistry practicals and thus more time should be allocated for practical lessons.

Students should also be put in discussion groups which teachers can monitor. In group work, students' opinions are valued and accepted. The teacher should ensure that the students take responsibility for their work through effective monitoring and by demanding feedback. The use of groups improves rapport between students, giving the class a more trusting and supportive atmosphere. Consequently, group discussions promote a positive attitude towards the teacher and the subject. There is need to make use of computers in teaching and learning of A-level chemistry. Computers can be used as tools, as reference libraries, as teachers, and as a rapid-action postal service. Notably, students love using computers and many students can benefit from the intelligible interactive content on computers.

The reading culture among A-level students needs to be improved. However reading does not guarantee learning. Reading requires that the learner takes responsibility for understanding and learning. The school administrations should put in place schedules for reading managed in such a way that during such time every student must be in class or library reading. Perhaps appropriate punishment can be given to those not abiding



by the set reading regulations. Proper career guidance needs to be given to chemistry students to give them motivation to study chemistry since some of them are of the view that chemistry curriculum does not meet the need of Uganda today.

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