TEACHERS AND LEARNERS PERCEPTIONS ON CONTINUOUS ASSESSMENT IN ORDINARY LEVEL CHEMISTRY IN TRIANGLE, MASVINGO PROVINCE ZIMBABWE.

BY

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In partial fulfilment of the requirements for the degree of MASTER OF SCIENCE EDUCATION IN CHEMISTRY (MScED-CHEMISTRY)

SEPTEMBER 2017
DECLARATION

I Magweva Clemence declare that this thesis presents my own original and unaided work. I also declare that this has never been published for academic purposes by any academic institution. The product is of my own views and not that of Bindura University of Science Education.

Signature…………………………………………………………

Date………………………………………………………………

Supervisor…………………………………………………………

Date………………………………………………………………

Chairperson…………………………………………………………

Date………………………………………………………………
DEDICATIONS

In the name of the Almighty God, the most compassionate and merciful one, my immediate family for enduring my absence from home, my supervisor Professor Isel Ramirez for the continuous patience, the government of Zimbabwe for granting me the chance to pursue my Master of Science Studies at BINDURA UNIVERSITY OF SCIENCE EDUCATION and Paul Muchinga for the computer skills, I say thank you for being around me.
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Finally, I would like to thank all people around me who directly or indirectly were involved and supported this project.

Thank You!!
ABSTRACT

The research was done to find out the perceptions of teachers and learners on continuous assessment in Chemistry learning in five High Schools in Triangle clusters in Chiredzi. Continuous assessment is a new phenomenon brought into schools by the Ministry of Primary and Secondary Education. Its implementation in schools brought in a lot of challenges and also improvements in secondary education. The research gathered information from Chemistry teachers and learners themselves. The targeted participants were hundred learners and twenty teachers of which seven were females and thirteen were males. Raw data to the study were obtained using interviews, observation and questionnaires. All quantitative data were processed into statistical analyzing presentations. Qualitative data were also processed into quantitative one for easy analysis. The overall findings of the research revealed that the bringing in continuous assessment using investigative tasks, practical tasks and projects was never piloted to defend its implementation in schools. Teachers, as implementers, were not workshoped to get the light on how to guide the learners, enough to produce sound assignments. The research also found that there was no mechanism put in place to avoid and remove cheating among learners. The coming in of tasks as continuous assessment stole valuable time for learning syllabus objectives since there is no specific time spared for tasks. The learners were overloaded by assignment tasks which were supposed to be done in every subject they partake. Most learners were doing ten or twelve tasks per term depending on the number of subjects they study and projects annually in each subject, on top of the syllabus demands on weekly exercises, practicals, fortnightly tests, quizzes, homework puzzles and termly tests. Several other difficulties gathered were shortage of apparatus in schools to cater for every individual learner to do separate task based on Chemistry learning, difficult tasks set, unsupportive parents (since some implements need to be bought), ZIMSEC website was difficult to access, format of task and project presentation are not clear and teachers –pupils ratios hampering task supervision because of too large classes. Basing on these findings, recommendations were suggested to improve the implementation of CA. The Ministry of Primary and Secondary Education should run workshops nationwide that intensively equip the teachers and learners with pre-requisite skills and knowledge to implement CA effectively. Learners could also be allowed to choose a project in the study area of science since it is STEM based learning and not particularly in separate subjects, however, the CA in Chemistry could be given space on the school timetable to give room for teachers and ZIMSEC officials to remove suspense, monitor and avoid duplication. ZIMSEC should try and test affordability and manageability of tasks before availing them to learners.
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## ABBREVIATIONS

<table>
<thead>
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<tr>
<td>CA</td>
<td>CONTINOUS ASSESSMENT</td>
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CHAPTER ONE

INTRODUCTION AND PROBLEM SETTING

1.1 INTRODUCTION

In this chapter, the researcher outlines the general overview of the study. This entails: circumstances that compelled him to partake of this study, the rationale behind carrying out this study, sub-problems linked to the study, as well as the significance of this study to various stakeholders. As the chapter progresses, the researcher highlights study boundaries and assumptions upon which this study is based. At the end of the chapter, the researcher scrutinizes challenges that scupper the smooth undertaking of this study, as well as, the conceptual analysis of key terms used in this study.

1.2 BACKGROUND TO THE PROBLEM

Assessment forms the basis of all effective teaching and learning, and it is such an indispensable tool, without which it would difficult an uphill battle for educators to realize a good number of their instructional goals. Since time immemorial, the need for assessment in a teaching and learning environment has been prioritized, and this has often been seen as instrumental to achieve curriculum goals (Mpofu, 2009). Assessment is manifest in two main apportionments: formative and summative (Mpofu, 2009; Madziyire, 2010). Both forms of assessment are equally pivotal in measurement of academic efforts, though classroom practitioners may prefer either of the two to the other, citing various considerations. Of late, CA has gained ground, in the form of continuous assessment (CA), and seems to incorporate more characteristics of formative than summative evaluation (Chakanyuka, 2012). In many tertiary institutions in Zimbabwe, CA is a widely used evaluative tool, and it has its merits and shortcomings as a mode of assessment.

The researcher has noted that the current curriculum dawned with a raft of changes in terms of learners’ assessment procedures. Long back, summative and formative forms of assessment have been in place, though the former seemed to enjoy more usage than its latter counterpart (Mpofu, 2009). According to Chakanyuka (2012), formative assessment is evident in three stages: before
teaching, during teaching, and after teaching. When done before the onset of a lesson, it is often construed as diagnostic testing - a technique commonly used by educators to check what learners already know about the concept in question (Ogunniyi, 2004).

Ogunniyi (2004) adds that formative assessment can still be done during the lesson, when the teacher navigates through the content of the syllabus. This can be done in the form of question and answer or home and tasks. In the same vein, Madziyire (2010) submits that immediately after teaching, formative assessment continues to test the learners on how much they have grasped. Continuous testing borrows some of the tenets of formative assessment, but excludes diagnostic testing, and comes in form of weekly, monthly or termly tests, assignments, homework, practical and experimental tests (Popham, 2008). On the other hand, summative assessment happens at the end of a training programme, and involves such tools as cluster or district examinations or standardized state or international examinations by accredited examination bodies (Chakanyuka, 2012; Mpofu, 2009). The researcher believes that continuous assessment is an ideal form of evaluating learners’ work in Chemistry, but it should be strictly monitored if it is to remain valid and reliable.

Most psychologists and educational thinkers who contributed on the aspect of continuous assessment acknowledge that using continuous assessment (CA) alone to evaluate pupils’ performance is inadequate, calling for educators to intertwine it with summative assessment (Popham, 2008; Mpofu, 2009; Madziyire, 2010). The inability by continuous assessment to solely evaluate learners’ overall capabilities stem from countless shortcomings the method is susceptible to. Harlet et al (2002) opine that continuous assessment is a complex evaluation procedure which is characteristic of a myriad of setbacks such as: the need for adequate time, resources and energy, as well as, its susceptibility to bias. Going in tandem with the above assertions are the observations of Wragg (2004), who claims that it is a mammoth task to use CA with large classes, since there are immense likelihoods of cheating, absenteeism, or even transfers.

In the Zimbabwean education system, CA has been prevalent in most tertiary institutions, as well as, in secondary schools but mostly in practical subjects such as Fashion and Fabrics, Agriculture, Building Studies, just to name but a few (Chakanyuka, 2012). This indicates that CA is not a new phenomenon in the current curriculum, but there must be adequate education to the teachers and learners on the criteria to be used, and the numerous benefits to be derived if CA is implemented
effectively (Mpofu, 2009). Wragg (2004) contends that CA is indispensable to all classroom practitioners as it offers opportunities for quickly diagnosing learners’ shortfalls, helps when streaming learners according to ability, aids to identify gaps of knowledge, as well as, assisting teachers to improve their methodologies (Madziyire, 2010).

Again, educators may use CA to identify areas of remediation or extension in learners, and since it is cumulative in nature, it can be an ideal evaluative tool to give the overall performance of a student, especially if partnered with summative assessment. Currently, in Ordinary Level Chemistry, CA carries a weighting of 30%, and is done as follows: two practical tests per term, three theory tests per term, and one project per year (ZIMSEC National Syllabus, 2015-2022). Each student should have a learner’s profile, detailing his/her performance in CA.

The researcher feels that CA is a desirable assessment tool, which however is dependent upon a litany of factors. Before the implementation of the current and updated curriculum, CA has been practiced in Chemistry, though to a limited extent. Currently, CA now constitutes a greater chunk of weighting in Ordinary Level Chemistry (30%), implying that examining bodies have realized the need to incorporate coursework input in the learners’ final mark. The researcher is worried that, while the idea of using CA is very noble, mostly if its principles are adhered to, in some instances, some of the tenets governing how CA should be done may not be enforced. In other words, the researcher agrees that there is no even playing field for all stakeholders being tasked to implement CA in all Zimbabwean schools, particularly in Chemistry.

Notwithstanding all these attributes of CA, the researcher shall try to ascertain the Ordinary Level learners and their educators’ conceptions of this vital evaluative tool in Chiredzi District, Masvingo Province. Thereafter, the researcher would like to recommend suggestions that would help to instill positive attitudes in teachers and learners towards CA, as well as, the effective use of CA in all schools, irrespective of their various socio-economic domains.

1.3 STATEMENT OF THE PROBLEM

The concept of CA is not only a complex one, but it requires a meticulous approach if it is to be used as an effective evaluative strategy in Ordinary Level Chemistry. According to Ogunniyi (2004), continuous evaluation should be done inseparably with its main tenets:
- That it should be valid, reliable and consistent,
- That it should be explicit, accessible and transparent,
- That it should have inclusive and equitable characteristics,
- That it should be an integral part of program design, and should relate directly to the program aims and learning outcomes,
- That the amount of assessed work should be manageable, and that CA should be intertwined with other forms of evaluation, to reap more positive results,
- That timely feedback that promotes learning and facilitates improvement should be an integral part of the CA process,
- That staff development policy and strategy shall be part and parcel of CA.

Having been so stated, it implies that the process of CA is not something to be taken for granted, as there are a good number of factors that should be considered and followed if CA is to be an effective evaluative tool. Mpofu (2009) also accepts that there should be interdependence and rapport between the learner and the educator, if the CA process is to be meaningful. Each of the parties involved in CA has a big role to play, if the results from such an evaluative strategy are to provide adequate evidence of achievement to other stakeholders such as parents, school authorities, examining bodies, or other educational institutions (Madziyire, 2010). Thus, both teachers and learners of Chemistry at Ordinary Level should have positive attitudes towards CA.

In assessing the perceptions of Ordinary Level Chemistry learners and teachers towards CA, the researcher has many issues at stake. One of the burning issues is the feasibility of CA in Zimbabwean secondary schools, particularly in Ordinary Level Chemistry. The researcher is of the opinion that a lot of shortfalls are abound to scupper the smooth implementation of CA. Uniformity is unattainable, considering that there are unique local conditions entangling schools such as: the school setting, socio-economic factors of pupils, as well as the culture of surrounding communities (Mpofu, 2009).

1.5 MAIN RESEARCH QUESTION

What are the Ordinary Level Chemistry teachers and learners’ perceptions on continuous assessment?
1.4 RESEARCH QUESTIONS

In trying to solve the main problem under study, the researcher tried to address the following questions:

(a) What do teachers and learners perceive as principles of CA?
(b) What are the merits of CA in Ordinary Level Chemistry?
(c) What are the setbacks of CA in Ordinary Level Chemistry?
(d) What mode of assessment has been used in Ordinary Level Chemistry before the introduction of CA?
(e) What techniques can be adopted to instill a positive perception of CA by teachers and learners in Ordinary Level Chemistry?

1.6 OBJECTIVES OF THE STUDY

This study aims to:

(a) Explore CA and its attributes
(b) Examine the strengths and weaknesses of CA
(c) Describe the forms of assessment that have been used in Ordinary Level Chemistry before the inception of CA
(d) Scrutinize the attitudes of both learners and educators towards continuous assessment in Ordinary Level Chemistry.
(e) Highlight ways of fostering positive perceptions towards CA in both learners and educators in Ordinary Level Chemistry, as well as, how to correctly carry out CA.

1.7 SIGNIFICANCE OF THE STUDY

The researcher hopes that this study may be beneficial to many stakeholders, among them, classroom practitioners, school heads, policy makers, curriculum developers, the job market, as well as institutions of higher learning.
The researcher feels that learners are going to be motivated and improve their self-esteem when they are exposed to CA. Regular testing after every concept learnt in Chemistry is instrumental in assisting learners to consolidate what they have learnt, and get remedial assistance on those aspects troubling them (Mwamwenda, 2001). More so, CA is useful to learners as summative assessment was often an incomplete form of evaluation which left out a great deal of learners’ previous and intermediate capabilities. Thus, consideration of coursework in Ordinary Level Chemistry shall greatly assist learners to amass marks as they go along their course of study, motivating them along the way. Continuously assessing learners also helps them to fight anxieties and stress associated with test taking, resultantly preparing them for summative assessment.

In addition, teachers may also find this study of great value to them as they are going to be acquainted with knowledge gaps that arise after assessing their learners. These gaps of knowledge are very significant to teachers, as they enlighten them of which areas they need to work on for self-improvement (Ames, 2002). Moreover, through CA, educators may realize the strengths and weaknesses of their teaching methods, thus, they may work tirelessly to improve test construction, lesson management, as well as examination administration (Madziyire, 2010). This implies that through CA, Chemistry teachers may revise variance of their teaching and learning methodologies, and also attain other vital attributes that improve their day-to-day professional skills.

School heads, policy makers and examining authorities may also realize the essence of equipping the teachers and learners with requisite skills of embracing CA with a positive mind. Thus, those authorities who want to encourage educators to implement CA may acquire the proper techniques of doing so, often sending teachers for workshops, to produce unbiased and credible results, and avoid unfavorable attitudes towards CA.

School managers may also be enlightened on CA implementation strategies, their roles and responsibilities, as well as, how they should supervise, monitor, and support CA. Curriculum developers may also benefit from this study by adhering to practically manageable assessment procedures to be recommended by this study. Those on the job market and those in institutions of higher learning may also use results of CA to select appropriate candidates for suitable jobs or programs in Chemistry respectively.

1.8 ASSUMPTIONS OF THE STUDY
The following assumptions are valid for this study:

(a) That continuous assessment in the Zimbabwean secondary education system which was being implemented without proper standard procedures.

(b) That continuous assessment may be susceptible to bias if its principles are not clearly understood and strictly followed.

(c) That continuous assessment is affected by local school conditions, such as; the school setting, socio-economic status of learners, as well, as the culture of the surrounding community.

(d) That the participants of this study, Ordinary Level Chemistry teachers and learners, are mature enough to offer credible and unbiased information as regards their perceptions of continuous assessment.

1.9 DELIMITATIONS

This study was done in Masvingo Province, Chiredzi District. Five schools were used; namely Mufakose High School, Muleme High School, Terry Goss High School, Hippo Valley High School and Mutirikwi High School. All these schools are in the Triangle cluster, and they boast of over five hundred students taking Chemistry at Ordinary Level. For the basis of this study, only 100 learners and 8 Chemistry teachers were used. Two heads from the five selected schools were also be used in this study. There is no boarding school among the five high schools from which the target population of this study was selected. The study focused on the perceptions of Ordinary level Chemistry teachers and students on the newly introduced CA system. The study was completed in 2017.

1.10 LIMITATIONS OF THE STUDY

The researcher would have preferred to carry out this study in many schools around Chiredzi, but the amount of time at his disposal restricted him to only five schools in his cluster. More so, a study of this magnitude would have required a very large sample, but both financial imbalances and scheduling constraints forced the researcher to deal with only 120 participants, among them 100 learners and 20 teachers. To cover up for time shortages, the researcher worked during weekends and school holidays to polish up his study, and he selected his target population with
discretion, so as to set precise parameters for the study and allow data gathered thereafter to be generalized.

In addition, the researcher is of the opinion that CA is a vital evaluative tool, but it needs time and proper workshops if classroom practitioners are to effectively implement all its tenets. Mwebaza, (2010) avers that CA is not about simply giving in-class tests, marking them, and giving oral feedback, but that it encompasses the complex process of proper testing, test management, grading, as well as, giving feedback, remediation and enrichment programs. These assertions imply that CA should have procedures and criteria to be followed if it is to reap intended goals. Against that background, the researcher notes that most Zimbabwean teachers, particularly those teaching Ordinary Level Chemistry, have not been subjected to continuous CA before, and may face numerous challenges to implement it in line with the demands of the current curriculum. Thus, its haste inception into the secondary curriculum may bring with it some mixed perceptions on teachers and learners, thereby affecting the outcomes of this study.

Finally, the researcher also footed bills to surf through the internet to search for contemporary sources of data on CA. He further met expenses, not of only typing and printing this piece of work, but of also travelling from school to school, on which data for this study was gathered. More so, the researcher was stationed far away from his tutor, making it a mammoth task for the two to constantly meet for suggestions and guidelines of this write-up.

1.11 DEFINITION OF TERMS

**Assessment** – the systematic collection of information about learners’ learning, using the time, knowledge, expertise, and resources in order to make decisions on how to improve learning (Mpofu, 2009).

**Continuous assessment** – the educational practice in which learners are examined continuously over most of the duration of their education, and the results of which are taken into account when leaving school. It is often proposed or used as an alternative to a final examination system (Ogunniyi, 2009).

**Perception** – conscious understanding of something (Webster’s Dictionary, 2015).
1.12 SUMMARY

This chapter mainly concentrated on what compelled the researcher to develop the urge to investigate the perceptions of teachers and learners on continuous assessment in Ordinary Level Chemistry. Research questions to be addressed in trying to find the solution to the main problem were analyzed, as well as the main objectives behind carrying out this research. Also scrutinized in this chapter was: the importance of the study to various stakeholders, the assumptions on which this study is based, possible difficulties met in trying to gather the evidence of this study and the boundaries of the research. An analysis of study boundaries and a glossary of key terms used in the study sealed the chapter.
CHAPTER 2

REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

This chapter serves to highlight pertinent ideas contributed by earlier and renowned educational thinkers, whose efforts on analyzing CA are still influential today. Some of these aspects encompass: the characteristics or principles of CA, its strengths and weaknesses as an assessment tool, as well as, how CA has been carried out in Ordinary Level Chemistry before its inception in the updated curriculum. Also to be alluded to is: the perceptions of both learners and educators towards the adoption of CA and the techniques that can be implemented to improve the face of CA in Ordinary Level Chemistry.

2.2 THEORETICAL FRAMEWORK

The theoretical background of this study is found mainly in Psychology, and particularly in the Theories of Motivation and Constructivism. Both theories shall be used interchangeably to model the framework upon which this study is hinged.

The Achievement Motivation Theory was coined and developed by McClelland (1953). The underlying attributes of the Achievement Motivation Theory state that the need for achievement in most human beings ensue successful endeavors. According to Atkinson (2004), achievement motivation refers to a want or need to excel, when performance is measured according to specified standards of attainment. Since learners are constantly aiming to enhance their self-worth, they tirelessly put all the required effort to preserve this invaluable component of their lives, and they are aware that once lost, self-respect and personal acceptance also vanish (Dweck, 2006). This implies that the Achievement Motivation Theory hinges on the belief that one’s self-worth supersedes all other facets of one’s life. The researcher believes that CA is an evaluative tool which educators can frequently use to enhance learners’ success and motivational needs, since teachers may fashion it to suit school conditions, socio-economic demands as well as the cultural trends of affected learners (Ames, 2002; Zindi and Makotore, 2015).
Achievement motivation hinges on both intrinsic and extrinsic motivation— which can all be attained by properly planned CA. As propounded by Zindi and Makotore (2015), intrinsic motivation refers to the zeal of any behavior that is dependent on factors that are of an internal indisposition. This implies that intrinsically motivated learners derive satisfaction and fulfillment by their ability to effectively deal with and manage their immediate environment. Properly structured and achievable items of CA may assist learners to achieve this form of motivation, if they are administered in a conducive and bias-free environment. Examples of intrinsic motivation are manifest in consistent and never-tiring students who work on given assignments till they attain success. A good number of cognitive psychologists aver that CA is a fundamental tool which can enhance learners’ intrinsic motivation by irking them to; be curious, explore, maintain a state of equilibrium, and establish a sense of competence (Zindi and Makotore, 2015).

In contrast to intrinsic motivation, is extrinsic motivation, which emanates from factors outside the learner. After CA, teachers may decide to motivate their learners by offering external rewards or punishing them, whichever the case may be necessary (Ames, 2002). This may be quite useful when educators want to improve their learners’ performance. Though psychologists recommend nurturing of both forms of motivation, recent research indicates that extrinsic rewards may undermine intrinsic motivation for interesting and challenging work, by denying people of a sense of control of their behavior (Mpofu, 1994). The researcher also opines that intrinsic motivation needs greater reinforcement, considering that the updated curriculum is STEM-based, and learners should be made to consciously embrace the relevance of doing Chemistry for improving their future personal and societal gains.

In addition, ideas from the Constructivist Theory are also going to model the framework of this study. Constructivism has become an influential concern in the facets of Psychology and Education, and it hinges on the assertion that learners are responsible and active agents in their knowledge acquisition process (Loyens, 2007). This means that the learner’s knowledge acquisition is a process of knowledge construction. Similarly, Cunningham (1992) submits that the core element of Constructivism is that learners interpret new information using knowledge that they have acquired. Thus, learners activate prior knowledge and try to relate new information to knowledge they already possess. Using CA, teachers and their learners can accumulate vast amounts of knowledge, which the latter may apply in their prospective careers.
Loyens (2007) also adds that cooperative learning is another attribute put forth by Constructivist theorists recommending that there should be meaningful social interaction between learners and classroom practitioners. Through CA, students and their teachers can socially interact in a bid to construct meaningful knowledge for the former. In the same vein, Paris and Paris (2001) postulate that cooperative learning as a component of Constructivism, enables learners to use their meta-cognitive skills to set academic goals, among them, self-regulation. Self-regulation is an umbrella term encompassing such aspects like goal-setting, self-observation, self-assessment and self-reinforcement, which are all believed to influence effective learning (Loyens, 2007). The researcher contends that all the above-mentioned components of self-regulation are also an integral part of CA, and are key in facilitating effective acquisition of Ordinary Level Chemistry concepts.

### 2.2.2 HISTORICAL BACKGROUND OF CA

Globally, CA is construed as one of the forms of educational assessments that provide feedback needed to maximize outcomes of all educational efforts (Birhanu, 2013). England, Sri Lanka, and Papua New Guinea, are renowned for sound and established traditions of CA (Wolf, 1995). The use of CA in developed countries is seen as a viable way to improve quality education, and to align education with a country’s needs (Black & William, 2009). Nonetheless, a large chunk of First World nations have often resorted to dependable and reliable examining boards such as Cambridge and Edexcel for summative assessment (Pennycuick, 1990). The minimal use of CA in other economically developed countries stems from the fact that the procedure is susceptible to a myriad of challenges, among them: lack of a leveling ground that allows for standardized test construction, as well as its need for adequate time and training of teachers.

In Third World countries, mostly those in Africa, CA is regarded as a fundamental tool that underpins educational assessment. In Malawi, CA has been used since 2000, and the results have been quite forthcoming (Kadzamira & Rose, 2001), while in Namibia, CA was introduced in 1994 as a way to address educational needs befitting Namibian nationals (Eimann, 2002). In Nigeria, CA was given the nod as an assessment criterion long back in 1977, following recommendations by the National Policy on Education in Nigeria (wwwisis.unam.na).

Tanzania is hailed as one of the oldest SADC countries to introduce CA in 1976, and this has been useful for diagnosing and remediating areas of learners’ weaknesses and modifying instruction (Birhanu, 2013). In Uganda, CA is being used in partnership with national external examinations,
and there is vast evidence that the two correlate (Kellagan & Greany (2003). This ideally means that there is a positive relationship between CA and excellent performance in summative standardized examinations. Lately, South Africa and Botswana have followed the footsteps of Tanzania and Nigeria, by adopting CA to aid final examinations (Eimann, 2002)

In Zimbabwe, CA is not a new phenomenon, having been implemented particularly in the practical as well as, Technical and Vocational subjects. In Agriculture and Horticulture, for example, the project system has been there since time immemorial, and in Fashion and Fabrics and Building Studies, learners’ practical work has been considered as instrumental when deciding their final grades. Nonetheless, it is worthwhile to note that only a few measuring apparatus were used to continuously assess learners, namely: projects and practical tasks or models. In Chemistry, CA has been practiced, through experimentation, group work, class work or tests, although the outcomes were not submitted to ZIMSEC to aid summative assessment.

The concept to continuously assess learners in all disciplines is a sequel to the recommendations ensconced in the 1999 Nziramasanga Commissions, whose submissions, among other things are that, the entire school curriculum should be competency-aligned in nature (Nziramasanga, 1999). These ideas got the nod of the current Minister of Primary and Secondary Education, Dr. Lazarus Dokora, whose call for an updated curriculum was embraced with both favorable and unfavorable attitudes. It is the issue of CA that is mind-gobbling, among other things, owing ideally to the unclear way it should be undertaken. Numerous assessment tools have been put at stake, and the chief implementer, the teacher is still ill-equipped as regards the inception of new CA models in all Zimbabwean schools.

In Science, particularly Chemistry, CA is construed as one of the most positive innovations of all times, and if correctly done, it has the potential to nurture true scientists, whose acuity in investigation, collection, and design technology are to reckon with. Though a lot needs to be done, especially on the aspect of equipping teachers with requisite skills of implementing CA and profiling, as well as ensuring that there is ample room for moderation of assessment tasks, CA will no doubt reap desired results in the near future.

Dr. Dokora could have emulated the merits of CA from neighboring countries South Africa and Zambia, who have all been instituting CA in their schools, and the outcomes have always gone for
a worthy cause (Quansah, 2005). In the International scenarios, formative assessment has already been practiced in schools in various western countries including Australia, Canada, Denmark, England, Finland, Italy, New Zealand and Scotland (OECD, 2005). Australia has since dropped CA system and shifted back to summative assessment citing various limitations that the system has.

The main purpose of this study shall be to ascertain the perceptions of those continuously assessed in Chemistry at Ordinary Level (learners), as well as those expected to execute CA in the aforementioned facet (teachers). In trying to do so, a wide range of aspects encircling the CA issue in Zimbabwe shall be assessed, from its main characteristics, the rationale behind its inception in the updated curriculum, its shortcomings as an assessment tool, as well as techniques that can be effected to surmount challenges associated with its use. Though Chemistry is now optional at Ordinary Level, owing to its need for adequate resources that may not be available in poor schools, the researcher intends to investigate how educators and learners perceive the use of CA in the subject.

2.2.3 THE CONCEPT OF CA

CA is a byproduct of both summative and formative assessments. Summative and formative assessments are often referred to, in a learning context, as assessment of learning and assessment for learning, respectively (Mwebaza, 2010; Gashaw, 2014). Assessment of learning is generally summative in nature and intends to measure learning outcomes and reports those outcomes to students, parents and administrators. Assessment of learning generally occurs at the conclusion of a class, course, semester or academic year (Zindi & Makotore, 2015). On the other hand, assessment for learning is generally formative in nature, incorporates CA, and is used by teachers to consider approaches to teaching and the next steps for individual learners and the class (Gashaw, 2014). This ideally implies that CA is a component of formative assessment and is an assessment model commonly used by teachers in their day to day assessment of their learners.

The Cambridge Advanced Learner’s Dictionary defines CA as an assessment system in which the quality of students’ work is judged by various pieces of work during a course, and not by one
examination. CA is an on-going assessment process, coupled with reviews, and observations in a classroom. Teachers use CA to improve instructional methods and students’ feedback throughout the teaching and learning process (Quansah, 2005). For example, if a teacher observes that some students do not grasp a concept, she or he can design a review activity or use a different instructional strategy.

Likewise, students can monitor their progress with CA tools such as periodic quizzes and performance tasks (Zindi & Makotore, 2015). The results of CA are often used to modify and validate instruction and CA is generally carried out throughout a course or project (Chakanyuka, 2012). CA, also referred to as ‘educative assessment’, is used to aid learning and in an educational setting, CA could be manifest in various forms, and would not necessarily be used for grading purposes.

2.3 PRINCIPLES OF CA

There are a good number of tenets governing how CA should be undertaken in the secondary school setting, and these are discussed below.

2.3.1 CA Should be Valid

This refers to the accuracy of an assessment, whether or not it measures what it is supposed to measure (Popham, 2008). In other words, validity ensures that CA tasks and associated criteria effectively measure student attainment on the intended teaching and learning outcomes at the appropriate level. This also implies that validity hinges on the curriculum demands, and there should be clear aims and objectives if this tenet of CA is to materialize (Mpofu, 2009). The researcher feels that in Chemistry at Ordinary Level, CA apparatus should be accurate and consistent for them to provide valid data.

2.3.2 CA Should Be Reliable

Reliability refers to the extent to which assessments are consistent. There is need for CA to be reliable, and this requires clear and consistent processes for the setting, marking, grading, and
moderation of assessment tools used (Madziyire, 2010; Stiggins, 2005). According to Punch (2000), reliability also refers to the level of integral consistency and stability of measure. Cresswell (2012), again alludes to reliability as the extent to which the same data would be collected each time repeated observations of the same phenomenon are made. Having been defined in all instances above, it follows that reliability in CA is concerned with accuracy and consistency of the assessment apparatus when repeated measurements are made.

2.3.3 Information about CA Should be Explicit, Accessible and Transparent

For CA to be reliable and valid as alluded to above, clear, accurate, consistent as well as timely information on assessment tasks and procedures should be availed to students, teachers, and any other interested external stakeholders, e.g. assessors or examiners (Chakanyuka, 2012). More so, there ought to be comprehensive use of varied assessment tools, to address many learning styles available to the teacher (Zindi & Makotore, 2015). This implies that CA should not only be in the form of routine tests or exercises mostly used in formative assessment, but should also incorporate assessment instruments that promote higher order and complex competences, e.g. quizzes, essay assignments, experimental work and projects. The above assessment tools ensure that learners execute a wide range of skills that are not provided for during summative state examinations (Mpofu, 2009; Quansah, 2005).

2.3.4 CA Should Be Inclusive and Equitable

As far as possible, and without compromising academic standards, inclusive and equitable CA should ensure that the assessment instruments and tasks are not in any way discriminatory (Takele, 2012). Though sometimes difficult to attain, especially when dealing with schools in developing and underdeveloped countries - Zimbabwe included- there should be a spirit of inclusivity and equitability when using CA in multi-cultured schools, including in those reeling under the agony of financial imbalances (Alousa, 2006; Paris & Paris, 2001). This assertion simply means that regardless of a school’s socio-economic standing, there should be uniform and transparent CA across the entire nation.

2.3.5 The Amount of Work Assessed Through CA Should Be Manageable

Sometimes the goals of CA resound unachievable owing to innumerable and unmanageable assessment tasks issued to learners by educators. In tandem with the acknowledgements of
Mwebaza (2010), the scheduling of assessment tools and the amount of assessed work required should purport to give a reliable and valid profile of achievement, without necessarily overloading teachers and learners. In addition, outlined as chief and reliable assessment tools by Quansah (2005), is class work, weekly, monthly or termly tests, as well as projects. Given adequate planning, the highlighted assessment apparatus above can serve well to provide an all-round assessment of learners (Fissela, 2010; Quansah, 2005).

2.3.6 CA Should Incorporate both Formative and Summative models

To adequately address the purpose of CA, both formative and summative forms of assessment should work hand in glove. This implies that all the components of formative and summative assessment should be incorporated in the teaching and learning situation, rather than using them separately (Selamneh, 2011). Similarly, CA should be cumulative in nature, always giving way for ample decision making along the spiral process (Suskiel, 2004; ICDR, 2004). It then follows that there ought to be thorough evidence of continually assessed work, through efficient data collection and proficient recording of learners’ progress (Madziyire, 2010). Without proficient record keeping, especially in Chemistry where assessment tools are abound, some of the formative assessments may be found missing at the end of the course.

2.3.7 Timely Feedback That Is Invaluable To Learners’ Improvement Should Ensue The CA Process

All students, regardless of gender, age and ability, are entitled to feedback on continually assessed tasks, as soon as they are marked (Egwu et al, 2009). The nature, extent and timing of feedback for each task assessed should be clarified to learners in advance. For feedback to serve its rightful purpose, that is correcting misconceptions as well as, making informed decisions about the next teaching and learning approaches, the teacher should be well versed in record keeping (Madziyire, 2010). In Chemistry, feedback should be prompt, and should be done with proper resources so as to consolidate concepts learnt. For example, after an experiment, the feedback should be done in the laboratory where the experiment was done in the first place.

Thus, feedback cannot be issued to learners or their parents, or to any external stakeholders, without making a detailed analysis of the assessment outcomes. Similarly, through feedback, teachers can consolidate concepts learnt, and can use this technique as a motivating factor to
learners who highlight the main points required on each assessed assignment (Zindi & Makotore; Mwamwenda, 2011). This literally means that as students raise valid points during feedback or revision time, and the teacher gives a nod as well as detailed emphasis, the former becomes motivated and urged to be more industrious for more future contributions.

2.3.8 CA Should Correlate With Curriculum Aims and Learning Outcomes

Assessment tasks should principally reflect the nature of the facet under consideration, and additionally ensure that learners are accorded opportune times to develop and master other generic skills and abilities (Quansah, 2005; Kapwembwe, 2011). To that effect, CA should be the overall tool providing information and feedback that sums up the teaching and learning process in a particular subject, in this case Chemistry at Ordinary Level. Moreover, Chakanyuka (2012) testifies that tasks assessed using CA should not be the teacher’s own volition, but should be derived from the aims and objectives of the National Syllabus, to make the process authentic.

Where both CA and summative assessments complement each other to award final grades to learners, tasks used on the former should be preparatory in nature and serve as a prelude for standardized state examinations, e.g. those from ZIMSEC, in the local scenario (Mpofu, 2009; Chakanyuka, 2012). In that regard, teachers should be oriented on how to effectively implement the CA process, to avoid unwarranted deviations from National Syllabus pre-requisites.

2.3.9 Staff Development Policy Should Be an Integral Part of CA

CA is construed as a complex assessment procedure which cannot be done by a layman, let alone a mere teacher devoid of its characteristics. This implies that all those educators partaking of CA should be competent enough to undertake their roles and responsibilities to the expected standards (Selamneh, 2011; Demmisse, 2001). It also follows that it should be the prerogative of the responsible ministry officials to regularly organize staff development workshops, to acquaint the classroom practitioner on the contemporary demands and guidelines of how to effectively implement the CA process (Fisseha, 2010; Muluken, 2006).

Such workshops, or even seminars, should also serve to inculcate uniformity standards of CA, resultantly using similar assessment procedures for all learners at a particular level, in this study, those taking Chemistry at Ordinary Level. In the current situation in Zimbabwean secondary
schools, the updated curriculum which compels all teachers to embrace CA has resounded a fray, due to limited staff development workshops done with the implementers.

2.3.10 CA Should Address Individual Differences

If CA is to be an all-rounder assessment tool, it should not be exclusively limited to academic circles, but should integrate all dimensions of a learner, from the classroom to outdoor and behavioral attributes (Sayed, 2009; Nitko, 2005). This principle hinges on the notion that talent in learners may be manifest in various scientific approaches (Popham, 2008). In Science, particularly Chemistry, the researcher acknowledges that some learners may be exceptionally good in investigation, others are exceedingly good in collection, and others may show remarkable performances in design, technology and experimental show casing, just to name but a few. This compels and calls for continuous assessors to device proper measuring apparatus to wholly assess their learners (Egwu et al, 2009).

2.3.11 CA Should Have Room for Moderation

Sometimes CA may be susceptible to shortcomings that may be beyond the teacher’s control or even that of his/her immediate supervisor. This then calls for moderation, a process that ensures: consistency of marking tasks, consistency of assessment for all learners, as well as, ensuring that marking is appropriate and conforms to the grade and mark descriptors (Quansah, 2005; Mwebaza, 2010; Selamneh, 2011). In the same vein, Stiggins (2005), avers that moderation of CA tools ensures fairness, accuracy and consistency in marking, making it possible for educators to provide outcomes which are not only a true reflection of the learner’s performance, but which can also be depended upon.

Notwithstanding training in implementing the CA, teachers in one school may be more lenient or more aggressive in their judgment than those in other schools (Madziyire, 2010; Fisseha, 2010). Thus, CA is a subjective phenomenon, which if carried out without moderation, may witness other teachers tending to use narrower or wider ranges of marks. In Chemistry at Ordinary Level, similar tasks and assessment guides should be given to all schools for uniformity.

2.3.12 CA Calls for Effective Supervision, Monitoring and Support

2.3.12.1 Supervision
In all instances where CA is an integral feature of the school curriculum, supervision forms the basis of the CA process. According to Alausa (2006), supervision aids to maintain system-level norms, implying that CA thrives under certain conditions which should be enforced if the desired objectives are to be met. In the same line of thought, Nitko (2005) contends that supervision promotes change and smooth development of the CA process and its intended goals. The supervision process should directly focus on the learner’s progress, and the supervisor should ensure that the quality and development of every learner is the key priority. This augments the assertion that CA must be of high quality so that the outcomes are not deceptive to the end user of the certificate (Suskie, 2004; Mwebaza, 2010).

Supervision also assists to uphold CA standards, to assure quality together with National Examination Boards, and to professionally develop teachers. The responsible ministry should use its rank and file to ensure that malpractices associated with CA are nipped in the bud (Madziyire, 2010). Additionally, there is also a tendency by supervision inspectors to rank schools according to financial muscles, another vice which can derail the effective teaching, learning and assessment that form the cornerstone of CA (Mpofu, 2009; Chakanyuka, 2012).

### 2.3.12.2 Monitoring

Ensuing supervision should be monitoring, a systematic process of observing, tracking and recording the entirety of the activities of CA for the purpose of measuring program implementation and its progress towards attainment of program objectives (Takele, 2012; Kapwembwe, 2010). As propounded by Popham (2008), the typology of monitoring is manifest in three major apportionments, namely: compliance monitoring, diagnostic monitoring and performance monitoring. With compliance monitoring, a wide range of school attributes are scrutinized to ascertain if the school can be trusted to an extent that it can come up with justifiable implementation and assessment of tasks. The key emphasis of compliance monitoring is on inputs to make sure that schools are in compliance with pre-determined norms of CA, including the feasibility of infrastructure (Sayed, 2009; Popham, 2008).

Likewise, there is also diagnostic monitoring, whose main aim is to focus on the implementation of the CA process. Diagnostic monitoring examines the merits and setbacks of CA, and is continuous, calling for variations and modifications of criteria and support where deemed
necessary (Sayed, 2009; Muluken, 2006). In other incapacitated learning institutions, teachers may face challenges that scupper the smooth undertaking of CA, and diagnostic monitoring will address that. Above all, performance monitoring anchors all the three modes, and its absolute emphasis is on results (Abiy, 2013; Quansah, 2005). It encourages ample room for competition between schools as a means to attain high levels of achievement. This form of monitoring requires neutrality, and should be bias free, lest it breeds cheating and other unwarranted forms of CA (Quansah, 2005).

2.3.12.3 Support

For the CA process to bear fruits there ought to be close liaison between implementers and the National Examination Boards, in Zimbabwe, ZIMSEC (Madziyire, 2010). This ensures that CA requirements are communicated to schools within permissive time lines, moderation is smoothly facilitated to recommended personnel, and intervention strategies are put in place where there are challenges encountered or anticipated. Again, ZIMSEC should brace for organizing and sponsoring staff professional development workshops, purported to equip teachers and school principals with relevant skills on how to properly institute CA and evaluating its quality assurance process (Chakanyuka, 2012; Madziyire, 2010).

2.4 STRENGTHS OF USING CA IN CHEMISTRY

2.4.1 Improvement of learner participation in the subject

Educators who properly implement CA may vastly motivate their learners to develop massive interest in their subjects (Atkinson, 2004). Since CA is a cumulative process that involves teaching, testing and feedback, if appropriately implemented at the various stages, it motivates students to have interest in the subject involved. For example, if after testing and giving feedback, the teacher gives learners extension or remedial activities accordingly, each category may feel valued and improve their attitudes towards the subject (Wragg, 2004; Mwamwenda, 2011). In summation, CA emboldens systematic study, avoids cramming, buttresses active involvement, inspires students, and guides pupils to convincingly prepare for exams.

2.4.2 Avoids exam mal-practices
In most cases, CA is not used in isolation with summative assessment, and the format used on CA tasks may aid as preparatory to the latter (Mwebaza, 2010; Gashaw, 2014). This implies that as learners write their final examinations, they will be aware of the nature of questions to anticipate if they have been exposed to suitably structured tasks during the CA process. Again, Gashaw (2014), adds that if pupils are made to embrace the idea that their course work marks constitute their final rating in a particular course of study (e.g. Chemistry), they are more likely going to develop positive attitudes and refrain from foul means of getting better grades. Thus the use of the one slot examination after several years of study fortifies attributes like cheating and cramming, which are not ethical ways of passing examinations (Ogunniyi, 2004).

2.4.3 School-based marks constitute the learner’s final mark in the subject assessed

Having been solely exposed to summative assessment through national examinations, learners have always been complacent throughout the course, aiming to cover up the knowledge gap at once towards final high stake examinations (Gashaw, 2014). This is not only detrimental to their expected outcomes, but it also breeds behaviors like cramming and memorization of facts. Thus to curb this disastrous practice, CA serves to keep learners on track, as their class work marks constitute the final rating. In the same vein, Atkinson (2004) avows that the school and the teachers concerned are motivated to churn out competent students who can stand their ground in higher learning institutions or on the job market.

2.4.4 Improvement of teachers’ methodologies

One of the most effective ways through which educators can gauge the successfulness of their teaching and learning approaches is through carrying out CA (Mwamwenda, 2011; Zindi & Makotore, 2015). This means that the outcomes of the CA process would assist teachers to see if their lessons were successful or not. This will not only encourage them to realign their methodologies in cases of failure, but to also devise other helpful mechanisms to aid the teaching and learning process, e.g. complementing their teaching and learning episodes with varied forms of media, to aid memory retention as well as to keep their lessons interesting, lively and animated (Wragg, 2004; Mpofu, 2009). Thus, CA enables the teacher to be creative and innovative, consequently enriching his/her professional growth.
More so, CA keeps teachers on their toes, as they endeavor to churn out excellent students who are not only creative and constructivists, but whose hands on skills are also clearly noticeable (Loyens et al, 2007).

2.4.5 Eradication of learners’ weaknesses

In another fruitful finding on Zambian schools, Kapembwe (2010), concedes that CA serves as an overture for summative assessment. In other words, CA is a rehearsal of standardized state examinations and may also help to diagnose learners’ areas of weakness and valuate learners on other aspects normally difficult to judge under examination conditions. To that effect, teachers assess some performance-based activities in a classroom environment and not feasible under exam conditions (Quansah, 2005). For example, during CA, the teacher may decide to assess competences in group or pair work, such as cooperation, leadership, decision making, team building, psycho-motor skills, and other affective forms of behaviors normally overlooked by summative assessment (Popham, 2008; Ames, 2002).

The researcher condescends that if left unvalued during the CA process, especially in Chemistry, such other skill-related virtues (investigation, collection, and design), may remain unknown to the learner’s prospective handler, either in higher learning institutions or on the job market.

2.4.6 Inclusion of the teacher in determining the learner’s final grade

To a greater extent, the teacher being the constant compatriot of the learner in the teaching and learning process throughout the course should not be entirely discarded in the final rating of the latter (Hogan, 2007; Santrock, 2006). This call for his/her input through carrying out CA on a variety of the learner’s other attributes immeasurable through state examinations. This assertion is heavily reinforced by the sentiments of Elliot et al., (2000), who endorse the dire need for CA as a way to acknowledge the role of the teacher in ascertaining the overall performance of the learner. In the same line of thought, Quansah (2005) reflects that where the teachers’ efforts are valued, there is a greater opportunity to induce an industrious attitude on them, subsequently motivating them. In Chemistry, through proper profiling and record keeping, CA may be a powerful weapon which teachers can use whenever learners’ past records are required by their prospective employer or higher learning institutions.

2.4.7 Allows teachers to give feedback and comments to learners
The CA process should terminate into feedback time, a component of assessment which allows the educator to pass desirable comments on the learner’s progress (Zindi & Makotore, 2015). The feedback should both be oral and in written form to cater for the entire class and individual learners respectively. Oral feedback may come in the form of class discussions on the overall class performance, emphasis on vital points, tips and hints of how to improve performance and even motivational speeches or career guidance (Eggen & Kauchak, 2004; Tan et al., 2003).

To add to that, Mwamwenda (2011) recommends teachers should encourage learners to take down notes whenever oral feedback is allowed, so as to enable the latter to make action plans using the targets of oral feedback. Again, CA allows teachers to pass written comments on learners’ individual, pair or group work, as a way to enlighten them on their strengths or weaknesses after an activity (Hogan, 2007). Written feedback should be positive, and not come in the form of sarcastic comments that may demotivate learners.

2.4.8 Allows for remediation and extension

Without instituting CA, whether for profiling learners or for the sake of testing, there would not be any basis for providing scaffolding and enrichment programs to improve learner performance (Mwamwenda, 2011; Zindi & Makotore, 2015). This simply means that without relying on the outcomes of a suitably enforced CA process, teachers would not be able to gauge their learners’ strengths and weaknesses, which prompts prescription of extension work and remedial assistance respectively.

Moreso, the CA process allows for interaction between the teacher and his/her learners, as the latter consult the former, classmates and any other sources to improve performance. Quansah (2005), admits that the consultative process prepares the learners for a normal work procedure in the adult world, where production is essentially based on research and cooperation, and not on timed test situations. Though not directly realized by learners, especially in their youthful days, these collaborative attributes are no doubt of paramount importance in the learners’ prospective professions.

2.4.9 Gives parents reports of how their children are progressing in school work

If there was no CA taking place in schools, the parent community and other interested stakeholders, such as officials from the responsible ministry, and the donor community who may want to offer
financial assistance, would never have accessed the learner’s cumulative progress as the course moves on (Abiy, 2013; Sayed, 2009). When parents send their children to school, the first and most important thing they want to hear is the performance and progress of their children in school work, and this can only be obtained by having a glance at the outcomes of CA. Teachers who are poor record keepers always head for a fallout with parents who may want to constantly keep abreast with their offspring’s’ performance, e.g. on consultation days (Mwebaza, 2010; Kapwembwe, 2010). Thus, outcomes of CA are the only means of effective communication of learner performance, either as exercises, tests, homework or experimental work.

2.4.10 Enables learner profiling

One of the fundamental characteristics of CA is record keeping, a process which enables learner profiling. A learner’s profile entails his/her progressive performance, together with records of areas of excellence as well as, areas needing scaffolding (Nitco, 2005). By merely looking at a learner’s profile, anyone can tell the direction the learner is heading in terms of progress. Profiling also covers up for unexpected events like absenteeism or transfers, allowing any interested stakeholders to refer to a learner’s profile to see how he/she has been performing previously (Madziyire, 2010; Chakanyuka, 2012).

Another leading educationist, Quansah (2005) also upholds the need for accurate profiling of students, as this can work as a motivation mechanism, if learners and teachers realize that their efforts will be valued by a good number of external stakeholders, including ministry officials. In the researcher’ view, learner profiling in Chemistry using prescribed CA standards will capacitate each teacher to be an examiner, though just like ZIMSEC examiners, every teacher involved in CA should receive adequate orientation to the system.

2.5 CHALLENGES FACING TEACHERS AND LEARNERS WHEN USING CA IN CHEMISTRY

2.5.1 Anxiety and Stress in Test Taking And Marking

For learners, test taking is a situation accompanied by tension and uneasiness due to fear for failure (Zindi & Makotore, 2015). For CA to be both valid and reliable there ought to be standardized
criteria to use in testing learners. For example, according to the 2015-2022 Chemistry National Syllabus, an Ordinary Level learner is supposed to complete a project each year, two practical tests per term, and three theory tests per term (ZIMSEC Chemistry National Syllabus, 2015-2022). The volume of assessment tasks requires the learner to be ever-busy and susceptible to all the anxiety, stress and pressure associated with test taking.

Similarly, the teacher should also possess an industrious attitude towards CA, lest the amount of work to be marked may resound an unattainable task. Ntiko (2005), hints that apart from CA being prone to cheating if not adequately supervised, teachers may also ‘cook’ marks as a way to beat recommended time lines or simply to assert external stakeholders.

### 2.5.2 Reduced Teacher-Learner Contact Time

In a scenario where assessment tools are varied, and numerous assessments have to be done, a large chunk of contact hours for classroom instruction is missed (Quansah, 2005). This is evident in many public schools, where the last two or three weeks preceding vacation are used for marking end of term tests, as well as, completing outstanding CA assessment record books (Chakanyuka, 2012; Madziyire, 2010). This is not normally the same situation in institutions where summative assessment is the main tool, often putting much emphasis on concept consolidation rather than continuously collecting marks. To that effect, assessment tools and tasks should be kept to standard levels, lest CA may restrict the amount of content to be grasped by learners due to limited interactive time. In Chemistry particularly, the syllabus may not be completed within stipulated deadlines if teacher-learner contact time is inadequate.

### 2.5.3 Use of Questions or Test Items That Require Easy Marking

Owing to the large number of tests and exercises to be marked, teachers develop a tendency of using assessment tasks that do not pose a lot of challenges when marking (Quansah, 2005; Gashaw, 2014). Simple true/false, multiple choice and mostly recall questions are commonly used, at the expense of higher level ability questions that solicit for the learner’s critical thinking and problem solving skills. Going in tandem with the above reflections are the ideas Hogan (2007) and Mwamwenda (2011), who both back the use of higher order questions in CA, particularly in Chemistry, to make the results representative of competences expected of the learners at any particular level of their course.
2.5.4 Lack of Uniformity in CA Procedures across Schools

Quansah (2005) decries lack of formal training to Zambian teachers involved in the CA process as a recipe for lack of uniformity in continuously assessing learners. Each school, and consequently each teacher, tends to adopt individual criteria of continuously assessing learners, and this inconsistency often creates immense disparities in the CA process nationwide (Abiy, 2013). In the Zimbabwean set up where the updated curriculum rolled into action at the beginning of 2017, there has been no intermittent workshops or seminars to accustom implementers to conformable parameters that are nationally homogeneous, particularly in Chemistry. The researcher upholds that though schools have been doing appropriate record keeping previously, the main concern lies on the quality of assessment instruments they shall exploit in relation to accomplishment of national goals.

2.5.5 Inadequate Training of Implementers of CA

Just as national or international examining bodies train personnel manning examinations on item construction, marking and moderation, implementers of CA need training on administering CA tools with high levels of efficacy (Mpofu, 2009; Madziyire, 2010). According to Chakanyuka (2010), CA is not just about issuing tests and exercises to learners, but it encompasses the whole range of decisions taken by the teacher in class to improve student achievement. All this expertise requires teachers to be sufficiently trained to acquire requisite CA skills. The researcher avows that here in Zimbabwe, a lot is yet to be done on how to satisfactorily equip teachers with suitable ammunition on how to implement CA, especially in Chemistry.

2.5.6 Lack of Remedial and Extension Instruction Based On CA Results

In most schools where CA is being carried out, little or no remedial or extension assistance is taking place, and this is principally due to volumes of assessments required to be done by a single teacher who is already overloaded with other pertinent school duties, let alone social commitments (Chakanyuka, 2012). A study carried out by Quansah (2005) in Zambian schools established that it is an uphill battle to use outcomes of CA to carry out remedial or extension programs, and subsequently, all the learners end up bunched together, notwithstanding their individual capabilities. Similarly, the researcher acknowledges that in Zimbabwe, the teacher is overburdened
by documentation to such an extent that time for effectively carrying out CA is compromised, particularly in Chemistry.

**2.5.7 Lack of Moderation**

In most Zimbabwean schools, the quality of CA absolutely rests with the classroom practitioner, and there is no one entrusted with the duty of verifying the authenticity of the tests, exercises and assignments used in CA system (Chakanyuka, 2012). As alluded to before, one of the underlying properties of CA is moderation, a technique used to ensure that the quality of assessment apparatus and the dependability of marks allotted to learners are unquestionable. Circuit supervisors should be availed, not as a fault-finding mission, but to monitor the procedures being used by various schools in implementing CA (Mpofu, 2009). In Zimbabwe, shortage of manpower is a likely predicament impinging upon the availability of circuit supervisors.

**2.5.8 Lack of Emphasis on Project Work**

All forms of CA that do not place much emphasis on project work are devoid of other requisite skills such as discovery, research, cooperation, decision making and critical analysis (Quansah, 2005; Madziyire, 2010). Most teachers have not been apprized on the need to hem in project work in the CA process as a way to inculcate other skills not formally provided by summative assessments. To this effect, teachers need enlightenment on the benefits of project work to learners, and they should have supervision skills to guide learners from topic choice, introduction, body and conclusion (Punch, 2000). When guiding learners, teachers should also ensure that they are achieving their objectives by assigning suitable tasks to learners during the supervision process.

**2.5.9 Effect of Unexpected Events**

It is a culture that in any school cases of transfers and absenteeism are abound due to countless unexpected events, and this has devastating effects on CA (Chakanyuka, 2012). A learner who misses a test, practical or theory, derails the progress of CA. Similarly, a transfer by a student to another school may affect the learner’s profile in the event that there are no uniform assessment criteria set in motion by national examining bodies (Bell & Cowie, 2001). In Chemistry, the researcher feels that uniformity is possible, especially if districts or provinces elect organizing committees to construct items consistent with national standards.
In Zimbabwe, unforeseen events such as death of a parent or guardian, as well as loss of employment by a breadwinner, may force a family to relocate to another area, consequently affecting the flow of progressive reportage of the learner’s performance. Again, the change of school, due to unexpected events may offer a new challenging environment for the student, who may find it difficult to adjust and acclimatize to the demands of the new environment (Madziyire, 2010; Mwamwenda, 2011).

### 2.5.10 Effects on Large Classes

To a greater extent, there seems to be a mammoth task to enforce CA when teaching extremely large classes (Zindi & Makotore, 2015; Santrock, 2006). Where the standard teacher-pupil ratio of approximately 1:35 is not applied, CA may be carried out but without following its basic tenets such as standardized item construction, moderation, and sufficient feedback. In most instances, educators are forced to minimize their assessment instruments at the detriment of quality, as well as, excluding higher order questions calling for development of critical thinking and research skills, due to large classes (Mwamwenda, 2011; Tan et al., 2003).

Moreover, when the teacher is working with large classes, there is a high likelihood that it may not be possible to effectively control the class, let alone monitor and address individual differences (Mwamwenda, 2011). Some undisciplined students have a tendency to take advantage of large classes to be involved in cheating, if not unruly behavior, resultantly compromising outcomes of CA (Eggen et al., 2003). In Chemistry, owing to large classes, experimental or practical investigations may be distorted due to incidences of cheating.

### 2.5.11 Conflict of interest

More often than not, teachers sometimes clash as they seek to possess students when CA results are wanted. During end of terms when outcomes of CA should be used to grade learners, there is a tendency by teachers to desperately need control over students to round off testing and measurement (Takele, 2012; Abiy, 2013). In such situations, test items are compromised and there is often no ample time for moderation, giving feedback, as well as offering fruitful remediation and extension work. The researcher notes that unlike situations where only summative assessment is prioritized, there is no last minute rush to collect marks from learners, since much time is devoted to lesson delivery and concept consolidation.
2.6 CA TOOLS COMMONLY USED IN CHEMISTRY AT ORDINARY LEVEL.

At Ordinary Level, and particularly in Chemistry, CA has been used in various circumstances but the outcomes did not entirely constitute the final mark.

2.6.1 CA Tools

Stiggins (2005) gives a wide range of tools commonly used by teachers in the testing and measurement of learners’ aptitude in a variety of teaching and learning situations.

2.6.1.1 Class Work

This refers to routine class exercises given either to check learners’ assumed knowledge before the onset of a lesson, or after a lesson, to check what the pupils have grasped after a teaching and learning episode (Zindi & Makotore, 2015). They may be manifest as recall questions, requiring simple one-word or short phrase answers, or they can be true/false questions. At Ordinary Level Chemistry, these assessment tools have been constantly used, though the frequency varied with each individual school as well as the learners’ abilities (Bell & Cowie, 2001). Marks obtained using class work have been solely used for diagnostic testing, and not for the basis of CA.

2.6.1.2 Homework

This is a technique of assessing learners by giving them tasks to do at home after a learning episode or as preparatory to what they will look at in the following lesson (Tan et al., 2003). When used after a lesson, homework serves to consolidate concepts learnt by exposing the learner to varied examples and also exploring higher order questions calling for higher order competences such as self-discovery (Eggen & Kauchak, 2004). When used as a prelude to forthcoming lessons, homework serves to induce creativity and inquisitiveness in learners, and motivating them to yearn for the ensuing activities (Ames, 2002; Dweck, 2006).

In Chemistry at Ordinary Level, homework has been used mostly after a given lesson, and the marks obtained have never been taken seriously for CA basis. Quansah (2005) warns that homework is liable to gross abuse when used as an assessment tool for CA, since it is difficult to verify if the learner accomplished the tasks without external aid.

2.6.1.3 Group Discussion
According to Mwamwenda (2011), group work is a teaching method in which the class is split into smaller units of between four and six learners, and different tasks are assigned to each group. Group work is a teaching and learning approach commonly used in Zimbabwean secondary schools, owing to inadequate resources and the numberless benefits it gives the learner. As an assessment instrument, group work should be strictly monitored to curb indiscipline, and to ensure that all the learners are taking part (Santrock, 2006).

Group composition should also be carried out with strict care, as the outspoken or the talented ones may dominate group contributions. In Chemistry at Ordinary Level, teachers were rarely employing group work because it is time-consuming, and it requires a lot of planning that can chew up a large chunk of the teacher’s time for other meaningful activities (Bell & Cowie, 2001). However, if suitably done, group work greatly reduces teachers’ talking time and marking loads, and engraves team work, leadership skills, respect, as well as communication skills in learners.

2.6.1.4 Weekly Tests

A test is question or a task or a series of such, designed to elicit some predetermined behavior from the person being tested (Zindi & Makotore, 2015). In the same line of argument, Mwamwenda (2011) and Ogunniyi (2004) proclaim that testing is the purposeful process in the classroom to collect data, both qualitative and quantitative. Hence, it is a broader term than measurement. For teachers, the purpose of CA is usually to make decisions about students either as a group or individually (Popham, 2008).

For example, teachers diagnose difficulties, verify learning after instruction, identify prerequisite learning and determine where to start in a learning sequence based on what students already know. In the classroom, testing may be done weekly, fortnightly, or monthly, and considers students’ performances on tasks in a variety of settings and contexts (Mpofu, 2009; Zindi & Makotore, 2015). CA may also be intrusive or not, in other words, students may know that they are being assessed or it may be seamless with instruction.

2.6.1.5 Experiments
An experiment involves a series of activities to be followed by a learner in a bid to reach certain conclusions regarding a problem under investigation (Bell & Cowie, 2001). Where resources allow, learners should do experiments individually, as a way to induce self-discovery. However, in many instances, experiments may be done in pairs or small groups, owing to costs involved in resource procurement. Notwithstanding any approach employed, experiments should culminate into deductions of the investigated phenomena, and should have findings related to previously done experiments of the same nature (Bell & Cowie, 2001).

In Chemistry at Ordinary Level, experimentation is a key teaching and learning technique, though in most Zimbabwean secondary schools, its effectiveness is hampered by a number of setbacks such as large classes, meager resources, lack of properly qualified teachers to institute it, and lack of adequate time (Madziyire, 2010; Chakanyuka, 2012). Experiments have been dominant in Chemistry at Ordinary Level, but the outcomes never constituted marks for use in the CA process. The updated curriculum emphasizes practical tests, through experiments of course, and this now empowers teachers to use marks from routine experiments to continuously assess learners.

2.6.1.6 Peer and Self Assessment

This has often been a common assessment strategy used by teachers after giving home work assignments, group work tasks or even test (Mpofu, 2009). Learners are given the opportunity to mark their own work (self-assessment), or that of their colleagues (peer-assessment). Self-assessment enables learners to diagnose their own weaknesses, and if well guided, gives massive room for professional growth. In the same way, peer assessment allows learners to measure capabilities of their fellow class mates, consequently improving their judgmental skills (Zindi & Makotore, 2015). Though liable to cheating if used without due care in CA, in Chemistry at Ordinary Level, this has been commonly practiced, and the teacher should finally endorse the assessed work to render it credible.

2.6.1.7 Project Work

In all countries where CA is practiced, project work is at the forefront and is compulsory (Quansah, 2005). In Zimbabwean tertiary institutions, project work constitute a large chunk of summative assessment, and in practical subjects, projects have been done to complement final state examinations. In the Sciences departments, particularly in Chemistry, projects have been evident
in the form of collections, investigations, as well as, designs in technological advancements (Chakanyuka, 2012). All these assessment apparatus have been meant to inculcate innovative behavior, research skills, cooperation, consultative skills, problem solving, critical thinking and self-discovery (Stiggins, 2005). These competences have often been overlooked during summative assessment.

2.6.1.8 Quizzes and puzzles

This is a type of questioning requiring the learners to have critical thinking skills, and to apply their knowledge of respective subject matter in multi-faceted situations (Mwamwenda, 2011; Santrock, 2006). Properly crafted quizzes and puzzles are ideal methods for group effort, or homework assignments respectively. Though difficult to craft, and sometimes requiring wide coverage of content, quizzes and puzzles should not be underestimated in CA, and students should be encouraged to do wide research when searching for answers to them (Stiggins, 2005). Similarly the researcher feels that puzzles and quizzes were rarely employed by Chemistry teachers, due to their need for adequate time and planning.

2.6.1.9 Oral Questions

Though seldom used by teachers, oral questions serve a lot of purposes as an assessment tool. According to Zindi & Makotore (2015) and Elliot et al., (2000), oral questioning involves the teacher dictating questions to learners, with the latter writing required responses. The same authors above concede that oral questioning greatly improves the learners’ listening and communication skills, which are essential in the entire teaching and learning process. In spite of the above assertion, Eggen & Kausak (2004) advocate for minimal usage of oral questioning in CA, since it depends on learner ability to master technical terms, and it disadvantages those learners with poor linguistic acuity.

2.6.1.10 Examinations

The commonest form of assessment that has been prevalent in most schools, in Chemistry or other subjects in the secondary school curriculum is the end of term, mid-year or end of year examination (Mpofu, 2009). Though summative in nature, sometimes these examinations as forms of assessment have been limited to content covered within certain timelines. For example, in Chemistry, end of first term examinations have been limited to testing content covered in that term,
while mid-year exams have also included material covered up to the middle of the year, and end of year examinations have incorporated work covered during the whole year. The researcher believes that all these forms of assessment have often left out other relevant content that could have been tested if CA was well instituted (Ntiko, 2005).

2.7 TEACHERS’ AND LEARNERS’ PERCEPTIONS OF CA

2.7.1 CA Is Time-Consuming

The entire CA process is not a simple one, often engaging the teacher with strenuous activities such as: item choice for test construction, planning, effective supervision of tests, marking, feedback, remediation and extension where necessary (Muluken, 2006; Alausa, 2006). All the aforementioned activities are time-consuming, considering the fact that there is also more time required for lesson delivery. This has often seen teachers and learners shunning CA, and only preferring standardized state examinations.

In other instances where CA tools are not monitored or moderated by a nationally appointed body, there is a tendency by other educators to use sub-standard criteria in generating CA marks for learners (Egwu et al., 2009). In another damning finding, Nitko (2005) asserts that due to time shortages, teachers may skip other invaluable concepts for fear of reaping undesirable results from learners, consequently depriving the latter in terms of effective skill acquisition.

2.7.2 CA Induces Uneasiness in Learners

On the part of learners, CA seems to put them under constant surveillance, a condition that brings about uneasiness and general exam fright or anxiety (Gashaw, 2014; Zindi & Makotore, 2015). Though with the passage of time, CA induces confidence of facing examination in learners, the constant collection of marks from them heavily keeps them edgy and restless. More to that, incidents of failure in previous tests and exercises render learners apprehensive and unsettled, compelling teachers to prepare mostly manageable tasks for learners during the CA process (Gashaw, 2014). Nonetheless, the sentiments of Loyens (2007) are respectable here, as he posited that consistently testing learners using properly designed CA tools is a mechanism that can be instrumental in allowing learners to construct a cumulative mass of knowledge basing on what they have amassed during previous testing episodes.
2.7.3 CA Is Not Feasible In Developing Countries

To a further extent, CA seems to be an expensive evaluative mechanism suiting only developed countries. There is need to use varied ICT tools to make sure that CA objectives are attainable, and the question here is whether CA is feasible at a school in Harare, much in the same way it can be applied to a satellite school in the newly resettled farms (Chakanyuka, 2012). This phenomenon places summative assessment ahead of CA, since the former is applicable in a wider range of situations. More so, in developing countries, it can be evident that the nature of CA varies from school to school depending on the schools’ material wellbeing, and this makes it impossible to attain outcomes that can be standardized. In South African schools, where resources allow, CA is done transparently, and there is a national body responsible for supervision, monitoring and support (Mwamwenda, 2011; Gashaw, 2014). In other countries like Tanzania and Zimbabwe, CA is left for public schools, while elite and private schools choose to have Cambridge internationally acclaimed examinations (Mpofu, 2009; Madziyire, 2010).

2.7.4 CA Needs Constant Supervision, Monitoring and Support From External Stakeholders

As part of the ethical principles of CA, supervision, monitoring and support ought to accompany the CA process, not as a witch hunting mission, but with a view to improve the face of CA (Ogunniyi, 2004; Mpofu, 2009). Nonetheless, educators feel that the nature of supervision they envisage is not formally done, and is tantamount to disturb and derail the progress of CA. The nature of supervision prevalent in the current situation in Zimbabwean secondary schools appears like CA has been in existence for over many decades. There is no room for accommodating errors from educators, let alone opportunities for scaffolding them where they are found wanting (Madziyire, 2010). This has often caused teachers to construe CA as a monster to them, devoid of any material that can propel their professional growth.

2.7.5 CA Is A Burden For Teachers

The Zimbabwean secondary school teacher, due to inadequate training, views CA as a heavy burden which can be gotten rid of through using summative assessment. CA is construed as an overload to the teacher, who is already entrusted with other countless duties in the school.
curriculum (Madziyire, 2010). The majority of teachers in many rural schools are operating with not only meager resources, but also extremely large classes, and to perfectly carry out CA, teachers have to go an extra mile, to the extent of marking learners’ assessment tasks at home, compromising their social wellbeing (Madziyire, 2010; Mpofu, 2009).

Sometimes teachers have to abandon their normal teaching routine to attend to continuous marking loads of CA. This means then that in the long run, the CA process ends up unnecessarily overloading the teacher, who should be constantly involved in adequate planning of other meaningful activities for learners. The researcher also yearns to have the teacher involved in the all-stakeholders meeting that devices criteria and models of instituting CA in Chemistry at Ordinary Level. Thus, CA should not be forced upon the teacher, but should be done with the teacher aware of his main roles (Quansah, 2005).

2.8 WAYS OF IMPROVING CA IN CHEMISTRY

2.8.1 Reorganizing Assessment Modes

If CA is to meet international standards, assessment modes should be heavily aligned towards project work, mostly to augment those skills to be acquired by learners but omitted by final summative examinations. Quansah (2005) advocates for the intense use of projects during CA as ‘project undertaking encourages learners to use higher order abilities and other important skills involving the use of investigative and knowledge integration procedures.’ The same author above also warns against issuing homework to contribute to school assessment as it is liable to cheating. In other words, it may not be certain whether homework assignments will be carried out without extra assistance, let alone copying from peers.

Thus effective CA, as per the prescription of Quansah (2005), should encompass group exercises (for cultivating cooperation, teamwork, group solidarity, leadership or punctuality skills), class tests (to inculcate individualism, recalling capabilities, and memory retention), as well as project work (which could be investigative, experimental, and materially productive). All the above-mentioned assessment modes are sure to impart the requisite competences expected of Chemistry
students, inter alia: creativity, team building, cooperation, group solidarity, enquiry, self-discovery, research and consultative skills.

2.8.2 Proper Administration of Times and Tasks for CA

For the sake of maintaining uniformity nationwide, CA should be carried out using similar time lines and tasks. According to the 2015-2022 Chemistry ZIMSEC National Syllabus, CA is given a weight of 30%, and should comprise: one project annually, two practical tests per term, as well as three theory tests per term. The researcher feels that these activities should have monthly time frames if the CA process is to follow a uniform pattern across the width and length of the country. Even expected practical and project tasks should be availed to all schools, in circular form, so that the nation accomplishes uniform and standardized goals (Chakanyuka, 2012). Moreso, there should be proper supervision of such time lines and tasks, to ensure that schools do not deviate from the national recommended guidelines.

2.8.3 Redesigning Content for CA Modes

The use of group exercises, class tests and project work should not be merely a routine for formative assessment, but should purport to fulfill fundamental goals of the updated curriculum in innumerable ways (Zindi & Makotore, 2015). The proponents of the new curriculum concur that it is a competency driven process, aiming at ascertaining what the learner can do, in contrary to what the learner knows. This means that through carrying out group work tasks for example, learners are expected to exhibit countless skills like team building, cooperation, and decision making, while through class tests, individual skills such as memory retention and self-discovery attributes are targeted (Santrock, 2006; Mwamwenda, 2011). In the same vein, when guiding learners through project work, they are expected to accumulate consultative, research, critical thinking and problem solving skills, which will benefit them in their prospective careers.

2.8.4 Moderation of CA

If CA is to reap intended results, there should be adequate moderation nationally so as to set uniform and accurate parameters that can be used in all schools. Where moderation of CA tasks is missing, there is a tendency by educators to employ unreliable assessment apparatus that do not effectively address desired instructional goals. According to Quansah (2005), moderation is a technique used to ensure that the quality of assessment apparatus and the dependability of marks
allotted to learners is unquestionable. Mpofu (2009) advises that circuit supervisors should be availed, not as a fault-finding mission, but to monitor the procedures being used by various schools in implementing CA. This is to ensure consistency, uniformity, accuracy and authenticity of assessment apparatus as well as outcomes.

2.8.5 Reduced Number of Learner Assessments

Since there appears to be negative factors impeding the smooth undertaking of CA, such as shortage of adequate time and resources, there ought to be consideration of reducing the number of learner assessments to make them achievable by any secondary school in Zimbabwe (Chakanyuka, 2012). This disparity in the number of assessments given by different schools is the cause why private schools opt to have their curricula aligned along international standards in terms of examination systems. However, interesting to note is the fact that in Zimbabwe, CA is used in partnership with ZIMSEC summative examination.

2.8.6 Maintaining Recommended Teacher-Pupil Ratios

One of the best means to obtain convincing and veritable evidence using CA is to keep class sizes as minimal as recommended by great educationists. Though affecting other aspects of the teaching and learning situation, such as resource allocation and conduciveness of learning, class sizes also affect the credibility of CA outcomes, as teachers sometimes rush through pupils’ work during marking so as to meet deadlines (Mwamwenda, 2011; Hogan, 2007). Keeping teacher-learner ratios to as low as 1:30, will inevitably allow the teacher to apply all the principles of carrying out CA with much ease (Mpofu, 2009). The researcher observes that this is however in direct contrast with what is happening on the ground in Zimbabwean schools, where up to sixty learners may form one class, and a teacher is allocated six or more such classes.

2.8.7 More Emphasis on Project Work

For CA to carry as much weight as is necessary, there is need for teachers not to underestimate the role of project work in facilitating learners’ effective acquisition of research and inquisitive skills (Quansah, 2005). According to Stiggins (2005), research work should be done by every student at Ordinary level since it inculcates creative thinking, cooperation, consultative and research skills. All the above mentioned skills are of a higher magnitude, and thus, are not realized through merely
giving tests, homework tasks and quizzes. Again, Quansah (2005) confirms that since summative assessment excludes the use of projects, it should hence be seriously incorporated when using CA.

2.8.8 Adequate Teacher Training on Proper Implementation of CA

In his analysis of the shortfalls facing CA implementation in Zambian secondary schools, Quansah (2005) advocates that it should be the prerogative of the Ministry of Education, Sport, Art and Culture to ensure that teachers at the helm of implementing the use of CA as a formative evaluative tool get adequate training first before rolling out the program. This allows schools to start on an equal footing, and using same assessment principles nationwide (Ogunniyi, 2004). The researcher notes sadly that CA in Zimbabwean schools was rushed through without adequate preparation on resource mobilization and training. The majority of teachers have been forcibly instructed to effect CA, but they are not conversant with equitable and transparent assessment criteria to use as a nation for uniformity’s sake.

2.8.9 Learners should be encouraged to do corrections

After the teacher has finished marking learners’ work, feedback as well as remedial and extension work should ensue the CA process, with those who have missed certain concepts being urged to seriously do their corrections. According to Santrock (2006), correction is the act of offering an improvement to replace a misdemeanor. This is done to ensure that if a similar challenge resurfaces, or anything similar, the learner will be able to set it right. Doing corrections timeously also helps learners to quickly correct their misconceptions, and to consolidate concepts learnt (Kapembwe, 2010). It should be the role of the teacher to make sure that learners have properly done their corrections, before progressing to the next concept or topic. It is through well mastered concepts that learners can construct new knowledge (Loyens, 2007).

2.10 SUMMARY
This chapter served to scrutinize some invaluable aspects concerning CA. These include: the tenets of CA, its benefits and shortcomings as an assessment procedure, and how Chemistry teachers in Zimbabwean secondary schools have been using it at Ordinary Level. Also assayed in this chapter was how teachers and learners perceive CA, as well as, the techniques that can be adopted by various stakeholders to improve the use of CA as an assessment tool, and consequently fostering favorable attitudes towards the system in both classroom practitioners and students. The next chapter will look at research methodologies.
CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter outlines the research design which the researcher adopted. The advantages and disadvantages of the research design are to be discussed as well. The chapter also examines the target population, the sample and the sampling technique, as well as, the merits and setbacks of the research instruments to be used to collect data for this study. The data collection procedure, the data analysis and interpretation plans, ethical issues, validity and reliability of research instruments, seal the contents of this chapter.

3.2. RESEARCH DESIGN

Best and Khan (2006) define a research design as a program to guide the researcher in collecting, analyzing and interpreting observed facts. In this case, the researcher adopted a qualitative research method. Qualitative research allows the researcher to talk face-to-face with participants. It is best used as a means of generating ideas, brainstorming solutions and developing hypothesis that the researcher may eventually decide to test quantitatively. Qualitative research seeks to understand a given research problem or topic from the perspective of the local population (Punch, 2000; Phillips & Pugh, 2011).

It is also effective in obtaining cultural behaviors in the social context of particular populations. The researcher chose the qualitative case study paradigm because it helps him to gain new perspectives on things about which a lot is already known, or to gain new more in-depth information that may be difficult to convey quantitatively.

3.3 TARGET POPULATION

Best and Khan (2006), define a population as any group of individuals that have one or more characteristics in common, and that are of interest to the researcher. The above authors further explain that the population may be individuals of a particular type, or a more restricted part of that
group. Thus, a population in research is the target group from which one intends to solicit information, notably values and attitudes. Fraenkel and Wallen (2006) aver that a population is defined as a group of individuals from which a sample is drawn. In this study, the researcher intends to investigate perceptions of both teachers and learners towards CA in Triangle cluster, found in Chiredzi District, Masvingo Province over 120 participants of which 100 are learners and 20 teachers.

3.4 SAMPLE

The sample consists of individuals selected from a larger group of persons called the population. Fraenkel and Wallen (2006) define a sample as a group in research study on which information is obtained. For the purpose of this research, the sample consists of 100 ‘O’ Level Chemistry learners and 20 Science teachers. The 100 learners consisted of boys and girls. Again, the teacher population comprised males and females.

3.5 SAMPLING PROCEDURES

The researcher used both purposive and random sampling. According to Borg and Gall (2009), a purposeful sample includes several cases at defined points of variation with respect to the phenomenon being studied. In this case, the researcher draws conclusions from Science learners in the Triangle cluster, located in Chiredzi District, Masvingo Province. MacMillan and Schumacher (2001) define purposeful sampling as a strategy to choose small groups or individuals likely to be acknowledgeable and informative about the phenomenon of interest. This means that purposeful sampling increases the usefulness of information obtained from small samples.

The researcher also employed simple random sampling to choose respondents for this study. The 100 pupils and the 20 teachers were chosen randomly as a way to avoid bias. Borg and Gall (2009) view random sampling as precisely a process of selecting cases, the selection of each individual from a population that provides every sample of a given size an equal probability of being selected. Thus, it is a process in which all individuals in the defined population have an equal and independent chance of being selected as members of a sample.
Best and Kahn (2006) postulate that in a simple random sample, the individual observation or individuals are chosen in such a way that each has an equal chance of being selected and each choice is independent of any other choice. Random Sampling was preferred because it permits the researcher to apply inferential statistics to the data. This therefore implies that sampling is a systematic process of selecting a number of individuals for study in a way that the selected individuals would equally represent the larger group, making it easier to arrive at generalizations for the whole group (Cresswell, 2012).

To get his required learners and teachers sample, the researcher placed 100 and 20 even numbers, respectively, written on small manila cards in small boxes mixed with odd numbers. He then asked the possible participants to pick a number randomly, without replacement. Those who picked even numbers were considered eligible to use in the study, while those who picked odd numbers were disqualified. The researcher felt that simple random sampling was the best since no possible respondents felt disadvantaged during the selection process.

3.6 RESEARCH INSTRUMENTS AND METHODS

These are instruments the researcher used in gathering data for the research. According to Borg and Gall (2009), research instruments are tools used in the collection of data in the conduct of a research. The researcher used three instruments namely; questionnaires, and data collection methods namely direct observations and interviews.

3.6.1 QUESTIONNAIRES

This was used to collect data from Chemistry teachers who participated in the research. The tool was used to collect data and information that ranged from teachers’ understanding of CA, tools used in CA, benefits of CA to learners, benefits of CA to teachers, challenges faced by teachers in implementing CA, challenges faced by learners in using CA, how teachers perceive CA as well as strategies that can be adopted to improve the use of CA in Ordinary Level Chemistry.
Best and Khan (2006) define a questionnaire as a document containing questions designed to solicit information appropriate for data analysis. Questionnaires are easy to analyze and are familiar to most people, for nearly everyone has had some experience in completing them (Popper, 2004; Cresswell, 2012). Again, the authors above contend that questionnaires do not generally make people apprehensive. This helped the researcher, because most of the participants were interested in completing questionnaires. More so, since names of respondents were excluded on the questionnaires, this gave the participants maximum liberty to freely express themselves (Best and Khan, 2006).

Another advantage is that questionnaires reduce bias. The researcher chose questionnaires because they maintain uniformity in questioning, and have no middleman bias (Popper, 2004). This implies that the researcher’s own opinions do not influence the respondents to answer questions in a certain manner which leads to the recording of inappropriate information. Questionnaires were also chosen because they can be made to conform to the level of respondents. The researcher chose the closed, as well as the open-ended questionnaire, as they were considered easy to answer, by allowing respondents to expound their feelings. Best and Khan (2006), also acknowledge that through the use of questionnaires, researchers can accumulate large amounts from a large population within a short period of time.

Furthermore, Leedy (2010) acknowledges that with questionnaires, information can be collected from people who are thousands of miles away, and whom the researcher may never see. Popper (2004) argues that unlike interviews, questionnaires are easy to plan, construct and administer, and since they bear no names or any other identification, there is a high chance for respondents to freely express their feelings and emotions.

Leedy (2010) also posits that questionnaires tend to eye blinker the respondents and direct them on those aspects the researcher requires, thus avoiding all other irrelevant data. This means that there is no likelihood that respondents would proffer unwanted information, since there are guidelines to be strictly followed.

Nonetheless, questionnaires do not probe respondents when they give interesting, ambiguous or unfinished answers, and they are not an ideal method of gathering data when dealing with illiterate respondents (Popper, 2004). This means that in other instances, respondents may give vague
responses, especially with open-ended items, making it difficult for the researcher to analyze such data. Moreover, they are also wholly unsuitable to the illiterate, and there are chances that some of the respondents may withhold information by either retaining the questionnaires or by destroying them. The problems cited above were not encountered because the questionnaires were administered to literate respondents, and the researcher did a pilot study to remove ambiguity and hence reduce bias tendencies.

3.6.2 OBSERVATIONS

In addition to the questionnaires on teachers, the researcher also physically observed his respondents, that is, the pupils, and took down necessary information for appropriate analysis. Best and Khan (2006), define an observation as a systematic data collection approach, in which researchers use all of their senses to examine people in natural settings. Having been so defined, it implies that observations have their own merits and demerits as instruments of research.

Wandelt (2010) believes that observations are advantageous since they provide direct access to the subjects under study. The researcher physically sees the subject and records what he/she wants unlike relying on reports or responses from asking people. Where people may need to falsify data, direct observation will guard against this draw back. Further to that, Leedy (2010) also contends that with observations, there is a greater provision for a permanent record. He argues that much of the physical behavior which is of high interest to the researcher is highly transient. The fact that all observation entails some form of recording means that it provides a permanent record of such events or behavior, thus permitting prospective analysis or future comparisons to be done easily.

Nonetheless, Leedy (2010) agrees that direct observation is time consuming and is highly susceptible to bias from the observer. This means that the observer may be tempted to record events that did not take place, and this may consequently undermine the validity and reliability of such observed data. Observer effect is also another potential weakness of observations, where the presence of the observer may influence the behavior of those subjects under observation. Thus strict care will be taken, lest the subjects to be observed may hide their actual behaviors, due to the fact that they are being observed. In this study, perceptions of teachers and learners towards CA shall be examined.
3.6.3 INTERVIEWS

Cresswell (2012) defines an interview as a process which involves collecting data through direct verbal interaction between individuals. Like any other research tools, interviews have got advantages and disadvantages.

The author above contends that interviews are suitable when one intends to solicit for information, even from illiterate respondents, as the wording of interview items can be modified to suit the level of interviewees. More so, with interviews, subjects cannot falsify data such as age, sex and race (Cresswell, 2012). Again, interviews help to build relations between the researcher and her subordinates, as there is a greater need to confide in each other, especially when dealing with sensitive information (Popper, 2004). This implies that apart from allowing researchers an immense opportunity for screening, inter-personal relations between the interviewer and interviewees improve tremendously.

The researcher preferred information about personal feelings, opinions and perceptions. Thus, another advantage of oral interviews is that, they allow for soliciting of sensitive information from respondents (Phillips & Pugh, 2011), and the respondents’ own words are recorded and ambiguities can be clarified. Respondents are able to give reasons for their responses. Interviews are not influenced by others in the groups (Best and Khan, 2006). In this case, the researcher can record firsthand information directly from the participants, such as their emotions and other behaviors.

However, oral interviews are disadvantageous in that they may be subjective and biased, and they are time consuming, especially when dealing with very large populations. Probes should be neutral and the interviewer must allow sufficient time for the respondents to answer and should stop anticipating and cuing potential answers. Again, with interviews, at times respondents may feel uneasy and adopt avoidance tactics if the questioning is too long, sensitive or deep. To mitigate this disadvantage, the interviewer should build trust and rapport with respondents, thus, making it possible to obtain information that the individual probably would not reveal by any other data collection method. More so, Borg & Gall (2009) suggest that interviews cannot provide anonymity for the respondents. To carry out face-to-face oral interviews on his large sample, the researcher arranged to have his interviews in stages over a long period of time.
3.7.1 DATA COLLECTION PROCEDURES

The researcher used questionnaires, observations and oral interviews as means of data collection. The questionnaires were collecting data basing on the main problem, sub-research questions, as well as assumptions and importance of study. The researcher distributed the questionnaires to the research sample and made follow ups to the questionnaires. On interviews, the researcher arranged time with the interviewees during their spare time. Pupils were interviewed in groups of fives. The researcher used a mobile phone to record the interviews. The responses were collected and recorded for future use in data analysis. The researcher explained to respondents that the results were strictly for research purposes only and therefore they should have maximum liberty to proffer their responses.

3.7.2 DATA PRESENTATION AND ANALYSIS PLAN

The data gathered from teachers’ responses to questionnaires, pupils’ responses to interviews and the researcher’s observations were presented on tables, bar graphs, pie charts and stem and leaf diagrams. The statistical graphs above are advantageous in that, they compact the given data, without altering it and they allow the researcher to make direct comparisons of his findings. The tabulated data was analyzed basing on the other findings from earlier researchers. Thus, the results or outcomes were analyzed with reference to the literature review section in Chapter two. The analysis chiefly involved the teachers’ and learners’ perceptions as regards the use of CA in Chemistry at Ordinary Level. The researcher’s observations during the CA process on learners shall also be scrutinized.

3.8 VALIDITY AND RELIABILITY
Wagner, Kawulich and Garner (2012), state that the research instruments used to collect data must be both valid and reliable. For the purpose of this study, a combination of questionnaires, direct observations as well as face-to-face oral interviews were used. The data collected should be valid and reliable. May (2011), further contends that in order for meaningful considerations to be drawn, the research should produce true knowledge on one hand, and repeatable on the other hand. These depict validity and reliability respectively.

3.8.1 VALIDITY

Popper (2004) defines validity as the extent to which the results of an evaluation procedure serve the particular purpose for which they were intended. Leedy (2010) defines validity as the extent to which an instrument measures what it is designed to measure. The instruments that were used by the researcher had strengths and weaknesses, and the researcher tirelessly minimized the detrimental effects of the latter. The researcher tried to guard against weaknesses of ambiguity, as well as vague wording. The researcher also resorted to the use of simple language as a way to avoid double-barreled questions.

3.8.2 RELIABILITY

Best and Khan (2013) define reliability as the level of integral consistency, and stability of measure. Cresswell (2012), also define reliability as the extent to which the same data would be collected, each time repeated observations of the same phenomenon are made. Thus, reliability is concerned with accuracy and consistency of the measuring instruments when repeated measurements are made. To ensure reliability of the data collected in this study, the researcher self-administered the questionnaires, gave clear instructions on how respondents should attempt them, and ensured that questionnaire items were related to the objectives of the study.

3.9 ETHICAL CONSIDERATIONS
This study was done within the realms of ethics of research. Proper permission was sought from all interested stakeholders before the researcher kicked off his study. Bindura University of Science Education, the Ministry of Primary and Secondary Education, as well the heads of schools where the study was done, granted permission to the researcher to carry out his study in the Triangle cluster. Webster’s dictionary (2015) defines ethics as what is morally good and bad behavior. Gomm (2008) alludes to research ethics as principles of good behavior by researchers. This study dealt with people in both quantitative and qualitative approaches, and as a result, the researcher exhibited some high morality. This study prioritized the following ethical considerations; informed consent, voluntary participation, as well as, anonymity and confidentiality.

3.9.1 ANONYMITY AND CONFIDENTIALITY

Both confidentiality and anonymity were not underestimated in this study. Bell (2010) submits that the researcher needs not to tell or insinuate which responses come from participants. Thus, on the questionnaire that was availed to teachers, there was no space for them to write names, credentials, or any identification features. The researcher also maintained high confidentiality, by assuring respondents that their responses were solely applied in the educational domain. This gave the respondents vast freedom to expound their feelings.

3.9.2 VOLUNTARY PARTICIPATION

Before partaking of this study, the researcher notified respondents that participation was entirely voluntary, and there were no reprisals to those subjects who were reluctant to continue participating in the study halfway. This means that, participation in this study was not by coercive force, as individuals did it on their own volition. This gave the respondents a greater opportunity to express their inner feelings, as they participated with free will.

3.9.3 INFORMED CONSENT

Informed consent refers to the revelation of the purpose, aims, as well as the study objectives to the participants by the researcher (Phillips & Pugh, 2011). To add to that, the subjects of this study signed a consent form, explaining all the details pertaining to the relevance of the study to various
stakeholders. This inevitably enabled the participants to feel valued, and to proffer authentic and credible information.

3.10. SUMMARY

The chapter laid the theoretical foundations for the practical conduct of the study. It considered the research design, the population and sample, as well as the sampling techniques and procedures. In addition, the chapter also looked at the strengths and weaknesses of the data collection instruments, as well as the ways to avert the latter. The data collection procedures, the data analysis and interpretation plans, ethical issues, as well as the validity and reliability of research tools were also examined at the closing sections of the chapter. The next chapter, chapter 4, will present, analyze, and interpret data collected from the research field.
CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 INTRODUCTION

The main purpose of this chapter is to display the evidence that the researcher gathered from teachers and learners. The data is presented on statistical tables such as frequency distribution tables, pie charts and bar graphs. Thereafter, the data is analyzed and interpreted. This implies that the researcher ascertains correlations or distinctions between his gathered data against the findings of other earlier researchers.

Fig 1 : BAR GRAPH SHOWING TEACHERS’ AGES (n=20)

From the bar chart above, it is manifest that of the respondents, one teacher (5%) is less than 30 years, 6 teachers (30%) are between 31 and 40 years, 9 teachers (45%) are between 41 and 50 years and 4 teachers (20%) are greater than 51 years of age. The data indicates that the researcher’s population of educators included those new in the system as well as seasoned teachers who have
seen a lot regarding assessment. This implies that the perceptions collected by the researcher depicted views from the rank and file of Chemistry teachers.

Table 1: FREQUENCY TABLE FOR TEACHERS’ EDUCATIONAL QUALIFICATIONS (n=20)

<table>
<thead>
<tr>
<th>EDUCATIONAL QUALIFICATION</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certificate in Education</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>Diploma in Education</td>
<td>11</td>
<td>55%</td>
</tr>
<tr>
<td>First Degree in Education</td>
<td>6</td>
<td>30%</td>
</tr>
<tr>
<td>Other (specify)</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>20</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

As regards teachers’ educational qualifications, it is noticeable on the frequency table above that of the teachers used in the study, 2 teachers (10%), had Certificates in Education, 11 teachers (55%), had Diplomas in Education, 6 teachers (30%), had a first Degree in Education, while 1 teacher (5%), had a Masters’ Degree in Education. Again, the researcher considered teachers with varying qualifications, to ascertain their perceptions on CA, particularly in Chemistry.

Table 2: FREQUENCY DISTRIBUTION TABLE FOR TEACHERS’ TEACHING EXPERIENCE (n=20)

<table>
<thead>
<tr>
<th>TEACHING EXPERIENCE (YEARS)</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>x &lt; 5</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>5 ≤ x ≤ 10</td>
<td>11</td>
<td>55%</td>
</tr>
<tr>
<td>11 ≤ x &lt; 15</td>
<td>5</td>
<td>25%</td>
</tr>
<tr>
<td>≥ 15</td>
<td>3</td>
<td>15%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>20</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
The frequency table above also reflects that of the teacher respondents, only 1 (5%) had less than 5 years working experience, 11 teachers (55%) had between 5 and 10 years of teaching experience, 5 teachers (25%), had between 11 and 15 years, and 3 teachers (15%), had greater than 15 years of teaching Chemistry. This data is ideally useful to the researcher as he worked with teachers who are fresh from college as well as those who are established in the system.

4.3 ANALYSIS OF TEACHERS’ RESPONSES TO RESEARCH RELATED ITEMS

FIG 2: TEACHERS’ FREQUENCY OF USING ASSESSMENT TOOLS (N=20)

From the bar chart above, it is manifest that teachers accepted that since the inception of the updated curriculum, they had ceased using quizzes and puzzles (75%), and they were slowly using class work tasks (75%) and weekly tests (85%). These results show that the dawning of the updated curriculum is chewing a lot of time that could have been useful for learners to partake in weekly tests and class work. Moreover, the educators strongly agreed or agreed that practical tests (60%),
project work (90%), as well as termly tests (100%), were now the commonest tools espoused by the updated curriculum.

**FIGURE 3 (b PERCEPTIONS OF TEACHERS ON BENEFITS OF CA TO LEARNERS**

\( n=20 \))

Information depicted on the bar graph above is that the majority of the teachers strongly agreed that CA is an instrumental tool that allows teacher-pupil feedback (100%), enables profiling (100%), as well as relaying feedback between the school and parents (95%). To a lesser extent, respondents highlighted that CA allows for remediation and extension (65%). This evidence means that CA is not currently serving its purpose of scaffolding those having problems, and enriching those who are gifted, and require acceleration programs. The fact that CA provides adequate
feedback between teachers, learners and the parent community implies that it is a necessary assessment tool, and consolidates the findings of Abiy (2013), who avers that CA is the only tool through which parents may know their children’s performances.

**TABLE 3: LIKERT TABLE FOR TEACHER PERCEPTIONS ON BENEFITS OF CA TO CLASSROOM PRACTITIONERS**

<table>
<thead>
<tr>
<th>BENEFIT</th>
<th>SA</th>
<th>A</th>
<th>U</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA leads to improvement of teachers’ methods</td>
<td>75%</td>
<td>25%</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CA includes teacher in assessing learners</td>
<td>100%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CA allows for teacher-learner feedback and vice versa</td>
<td>100%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CA allows for remediation activities</td>
<td>70%</td>
<td>30%</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CA promotes extension work for the gifted</td>
<td>45%</td>
<td>35%</td>
<td>20%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CA relays messages between teachers, learners and parents</td>
<td>95%</td>
<td>5%</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CA provides information for profiling learners</td>
<td>100%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Information on the Likert Table above reflects that the majority of teachers cited a good number of benefits of CA such as: improvement of teachers’ methodologies (100%), inclusion of the teacher in assessing learners (100%), allowing remediation (100%) and extension activities (80%) to take place, as well as enabling the profiling of learners. Though learner profiling was still a new experience in the updated curriculum, a good number of educators were supporting the need for learner profiling, as it enables smooth transitions within various learning stages. Moreover, the respondents also indicated that though not being frequently used in the Zimbabwean set up due to time constraints, the issue of remediation and extension work was possible with the inception of CA in the updated curriculum.
Finally, the teachers accepted that CA is an instrumental mechanism to relay information about learners’ progress, between individual learners, between learners and their teachers, and between learners and parents. This assertion by the teachers is akin to the revelations of Mwebaza (2010) and Kapwembwe (2010), who admit that CA provides feedback of learners’ performances to their parents, e.g. during consultation days.

**FIGURE 4: TEACHERS’ PERCEPTIONS OF CA**

Teachers had varying perceptions as regards the use of CA in Chemistry at Ordinary Level. The majority of teachers argued that CA is a time consuming process (100%), especially with the current situation where numerous tasks and projects were being done to cover up for the time lost due to late implementation of the updated curriculum. Moreover, the teachers accepted that CA induces uneasiness in learners (90%), is a burden (95%) and not practical in Zimbabwe (70%), and
requires adequate supervision (100%). However, 70% of the teachers refuted the ideas of being monitored by external officials during the carrying out of the CA process.

TABLE 4: LIKERT TABLE FOR CHALLENGES ENCOUNTERED BY TEACHERS
WHEN USING CA

<table>
<thead>
<tr>
<th>CHALLENGES</th>
<th>SA</th>
<th>A</th>
<th>U</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Use of sub-standard assessment items</td>
<td>-</td>
<td>20%</td>
<td>-</td>
<td>80%</td>
<td>-</td>
</tr>
<tr>
<td>2. Lack of uniformity on tasks and test items</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>3. Inadequate training on use of CA</td>
<td>100%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4. Lack of moderation on assessment tasks</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td>5. Competition for control of students</td>
<td>80%</td>
<td>20%</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6. Limited teacher-pupil contact time</td>
<td>100%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7. Dealing with large classes</td>
<td>60%</td>
<td>40%</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

From the table above, it is manifest that teachers disagreed or strongly disagreed that: CA involves the use of substandard tasks (80%), CA has no moderated tasks (100%), and that CA lacks uniformity on tasks that were being disseminated to learners countrywide (100%). This is because in the new set up of ZIMSEC and how to carry out CA, there uniformity of tasks and projects nationwide, and the ZIMSEC policy document hinted that there would be moderation of tasks from school level up the evaluation ladder. In addition, teachers accepted that there was inadequate training of both implementers of CA and the learners (100%), there is massive competition for control of students during the carrying out of tasks (100%), there is very limited teacher-learner contact time (100%), and there are extremely large classes to enable the smooth undertaking of CA (100%).

That large classes scuttle the smooth running of the CA process is a resemblance of the findings of Tan et al. (2011) and Santrock (2006), who acknowledges that where the class size surpasses the standard teacher-learner ratio, CA would be construed as burdensome, time consuming, and
an extra load for the Chemistry teachers. In the same vein, Mwamwenda (2011) warns that large classes during the CA process render it prone to disorderliness due to lack of discipline.

**TABLE 5: CHALLENGES FACED BY LEARNERS WHEN USING CA**

<table>
<thead>
<tr>
<th>CHALLENGE</th>
<th>SA</th>
<th>A</th>
<th>U</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Anxiety and stress of test taking</td>
<td>20%</td>
<td>60%</td>
<td></td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>2. Reduced contact time with teachers</td>
<td>75%</td>
<td>20%</td>
<td></td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>3. Lack of remedial and extension work</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Exposure to non-moderated activities</td>
<td></td>
<td></td>
<td>75%</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>5. Lack of exposure to project work</td>
<td></td>
<td></td>
<td></td>
<td>85%</td>
<td>15%</td>
</tr>
<tr>
<td>6. Prevalence of unexpected events e.g. transfers</td>
<td></td>
<td>50%</td>
<td>35%</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>7. Prevalence of large classes</td>
<td></td>
<td>20%</td>
<td></td>
<td>75%</td>
<td>5%</td>
</tr>
</tbody>
</table>

On the part of learners, there were positive indications that CA induces stress due to continuous exposure to tasks and projects (80%), there is an outcry that time for lesson delivery has been taken by tasks and projects (95%), and there is no form of remediation and enrichment taking place due to limited time constraints (100%). these sentiments by learners indicate that, though CA has managed to bring numerous benefits, there are other shortcomings related to its use. That CA does not allow for remediation and extension activities opposes the sentiments of Zindi and Makotore (2015), who advises teachers to provide scaffolding and enrichment programs to learners during the CA process.

The learners were undecided on the claims that they will be exposed to non-moderated activities (75%) and that there were numerous transfers in the school (35%). Interestingly, learners did not see that the presence of large classes was detrimental to the outcomes of the entire CA process (80%), and they refuted claims that the CA process did not put emphasis on project work (100%). This implies that the ZIMSEC format resembles the recommendations of Quansah (2005), who advises on use of projects during the CA process to inculcate skills like self discovery, research,
innovation, consultative, decision making and critical analysis. Similarly, Madziyire (2010) submits that the vast number of competences alluded to above are very necessary during CA, as they are not commonly assessed during summative assessment.

**TABLE 6 : WAYS OF IMPROVING CA IN CHEMISTRY**

<table>
<thead>
<tr>
<th>WAY OF IMPROVING CA</th>
<th>SA</th>
<th>A</th>
<th>U</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Putting more emphasis on project work</td>
<td>80</td>
<td>-</td>
<td>-</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>2. Redesigning content for CA</td>
<td>90</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3. Moderation of CA tasks</td>
<td>100</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4. Reduced number of CA tasks on learners</td>
<td>100</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5. Maintaining recommended teacher-pupil ratios</td>
<td>85</td>
<td>5</td>
<td>-</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>6. Adequate teacher training on implementing CA</td>
<td>100</td>
<td>-</td>
<td>--</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7. Encouraging learners to do corrections</td>
<td>-</td>
<td>30</td>
<td>60</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>8. Proper administration of CA tasks and timelines</td>
<td>85</td>
<td>5</td>
<td>-</td>
<td>10</td>
<td>-</td>
</tr>
</tbody>
</table>

As regards the strategies that can be put in place to improve the CA process, there was an overwhelming response that CA tasks be moderated (100%), there should be reduced number of CA tasks for learners (100%), there should be adequate training on both teachers and learners on how CA should be undertaken in schools (100%), and the content to be given to learners should be redesigned (100%). This implies that implementers of the CA process should undergo some refresher training on how to partake of the implementation process with ease. This finding consolidates the recommendations of Mpofu (2009) and Madziyire (2010), who acknowledge that educators should undergo training of how to effectively construct items to be used during CA. In the Zimbabwean scenario, the researcher feels that the training is needed on unpacking the tasks and projects, as well as on the format to be adopted by all learners in attempting the CA tasks.
Again, it is noticeable that 80% of the respondents recommended for putting a lot of emphasis on research, while 20% felt that research is strenuous and consumes a lot of time. The respondents also agreed on proper administration of timelines set for completion of CA tasks to maintain high standards nationally (90%). 90% of the respondents also felt that standard teacher pupil ratios were supposed to be put in place, to improve the face of CA. The need to maintain normal class sizes is a resemblance of the recommendations of Santrock (2006), and Mwamwenda (2011).

4.5 ANALYSIS OF RESULTS FROM OBSERVATIONS

4.5.1 TIME ALLOCATED FOR CHEMISTRY ON THE TIMETABLE

The observations made on the time tables as regards Ordinary Level Chemistry indicated that the subject had been allocated lesser time than that recommended by ZIMSEC. In all the schools observed, the researcher noted that no school allocated the maximum number of 35 minute lessons recommended by the National Syllabus. The table below shows the number of Ordinary Level Chemistry lessons allotted at the time table.

<table>
<thead>
<tr>
<th>SCHOOL CODE NAME</th>
<th>NUMBER OF CHEMISTRY LESSONS PER WEEK</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>6 x 35 minutes</td>
</tr>
<tr>
<td>B</td>
<td>6 x 40 minutes</td>
</tr>
<tr>
<td>C</td>
<td>5 x 40 minutes</td>
</tr>
<tr>
<td>D</td>
<td>5 x 40 minutes</td>
</tr>
<tr>
<td>E</td>
<td>6 x 35 minutes</td>
</tr>
</tbody>
</table>

The researcher feels that the times given above do not suffice for Chemistry, considering that notes have to be written, experiments have to be done, weekly and termly tests should be written, and an additional load of projects and assessment tasks ensconced in the CA set up should be timeously done. ZIMSEC insists that all Chemistry lessons at Ordinary level should have a minimum of 8 x 35 minute lessons per week, a condition that was not met by all the schools used in this study.
4.6 CLASS SIZES

The researcher noted that the average number of Chemistry learners per class at each of the five schools used ranged between 30 and 40. Only at one school did the researcher notice a class with over 50 students. The researcher observed that there are challenges associated with the sizes of classes, particularly in Chemistry. The table below shows the average learners in each Chemistry class at each of the schools used in this study.

<table>
<thead>
<tr>
<th>SCHOOL CODE</th>
<th>AVERAGE NUMBER OF LEARNERS PER CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>33</td>
</tr>
<tr>
<td>B</td>
<td>38</td>
</tr>
<tr>
<td>C</td>
<td>32</td>
</tr>
<tr>
<td>D</td>
<td>52</td>
</tr>
<tr>
<td>E</td>
<td>31</td>
</tr>
</tbody>
</table>

Only school D had over 50 learners under the jurisdiction of 1 teacher. In such a class, there should be adequate rationing of resources, lest some activities like group work may not materialize.

4.6.1 TEACHER-PUPIL RATIO

The researcher noted that 4 of the 5 schools (80%), had favourable teacher-pupil ratios of an average of 1: 35. This ideally means that the teacher-pupil ratio is not far away from the standardized and recommended one, and hence there were chances that teachers would not face challenges to administer CA tasks and projects. There was only 1 school whose teacher-learner ratio was too high to allow for effective teaching and learning of CA.

4.6.2 NATURE OF LABORATORIES AT THE SCHOOL (SIZE, STATE)

Of the 5 schools used, only one school (20%), had a spacious and well-equipped laboratory, which could accommodate up to fifty learners with ease. The other four schools (80%), had small
laboratories, that could absorb up to a maximum of twenty learners. this implies that practical experiment cannot be done effectively.

4.6.3 QUANTITY OF APPARATUS AND CHEMICALS IN LABORATORIES

Most of the equipment in the observed laboratories was now obsolete and outdated. The researcher noted that school managers were not replenishing the contents of Chemistry laboratories at their institutions. The number of apparatus was not consistent with the quantity of students served by these laboratories.

4.6.4 QUALITY OF APPARATUS AND CHEMICALS IN LABORATORIES

In most schools observed, the state of apparatus used by learners was deplorable. Most of the apparatus showed signs of ageing, and some were showing signs of damages. This was seen as detrimental by the researcher, as there would be compromises on measurements. The researcher also noted that there was a tendency by schools to use chemicals purchased the previous years, which also implied that some of the experiments could not materialize, as there were possibilities of using expired stuff. Only one school (20%),

FREQUENCY OF SUPPLY OF LABORATORY EQUIPMENT AND CHEMICALS

The researcher also got hold of statistics pertaining to departmental orders, and noted that laboratory supplies were not done on a regular basis. It appeared like school managers took a lot of time to replenish depleting laboratory supplies, a situation that posed problems to learners on how they could do their practical or experimental work with ease. There was only one school (20%), showing that orders for the Chemistry Department were done yearly, but mostly for chemicals. There were no orders indicating that there were orders of laboratory equipment sourced for schools.

4.6.6 ASSESSMENT TOOLS USED BY CHEMISTRY TEACHERS

From the observations done on the learners’ written work, it was manifest that Chemistry teachers were making use of a good number of assessment tools, among them: homework, practical and
experimental work, class work, and tests. These assessment tools were used by the Chemistry teachers before the inception of CA. The researcher noted that if well oriented, all the teachers used were able to embrace the assessment tasks recommended by the CA process. It was however unknown whether the Chemistry teachers would continue to use the wide range of assessment tools, on top of those chiefly recommended by the CA process in Zimbabwe. ZIMSEC was mum on how teachers would intertwine new CA tools with those commonly used before.

### 4.6.7 TEACHERS’ RECORDS

From the teacher’s records, the researcher observed that teachers had recorded were previous assessed tasks, such as homework, experimental work, and tests. Since the study was done before the CA process went into full swing, there were no records of CA, though there were very strong indications that all the teachers used were capable of capturing and safekeeping records of learners’ progress. The researcher noted and concluded that the Chemistry teachers used were all duty conscious, though the only records missing from their portfolios were those of remedial and extension activities. No reasons were solicited for the missing records, but the researcher felt that this was a general tendency by established teachers to overlook learners’ individual differences. Though overlooked in the above instances, the issue of remediation and extension is supported by Zindi & Makotore (2015), who proclaim that correct implementation of the CA process will enable teachers to scaffold and enrich struggling and gifted learners respectively.

### 4.6.8 PROJECT WORK

At the time this study was carried out, both learners and teachers did not know the way project work was to be undertaken. There were no any projects done, and even the teachers who were expected to supervise these projects had no knowledge of how project work was to be carried out. Nonetheless, there was evidence at three of the schools used (60%), that learners were already constructing data collection tools. The researcher noted that this was one of the greatest strengths of CA in Zimbabwe, as learners had the exposure to display a variety of attributes during research
work. Quansah (2005) and Madziyire (2010) acknowledge that the CA process should have provision for project work, to enable learners to acquire such skills as innovativeness, creativity, collaboration, consultative as well as problem solving skills.

4.7 DISCUSSION OF THE FINDINGS

The findings of the researcher shall be discussed basing on the study’s research questions.

4.7.1 ANALYSIS OF STRENGTHS OF CONTINUOUS ASSESSMENT

The gathered data indicated that if used with its principles strictly adhered to, there are high chances of reaping positive results out of CA. The study revealed that CA is instrumental in improving teacher methodologies as well as learner participation. The respondents argued that the results culminating from CA are useful indeed in having improved motivation for the learners, while teachers would align their methodologies along desirable standards. These findings go in tandem with the observations of Mwamwenda (2011), who acknowledges that CA does not promote cramming in learners, but emboldens systematic study, and buttresses active involvement on the part of the learners. Zindi & Makotore (2015) also posit that CA enables teachers to be creative and innovative, consequently improving their professional growth. The researcher also contends that the Zimbabwean dimension of implementing CA would enable teachers to carefully cover the entire syllabus, in a similar fashion nationwide, as the tasks and projects given to learners should follow guidelines of the National Syllabus.

4.7.2 ANALYSIS OF WEAKNESSES OF CONTINUOUS ASSESSMENT

The results gathered also indicated that CA was also prone to innumerable challenges, among them: the shortage of time to have meaningful learning in preparation for summative assessment, inadequate training of implementers, effects of absenteeism and transfers, large classes, lack of feedback, as well as lack of remediation and extension work. The respondents indicated that due to the large volumes of work ushered in by the inception of CA, it was highly possible that preparations for the 70% summative assessment weighting could be scuttled, as there would be
less contact time between learners and teachers. This assertion is akin to the findings of Quansah (2005), and Chakanyuka (2012), who advocate for a limited number of CA tasks for learners, to enable them to normally partake in the learning process preparatory for summative assessment.

Moreso, the main implementers (teachers) submitted that they are ill-equipped as regards the carrying out of tasks and projects involved in the CA process. The majority of teachers and learners assumed that the CA process would incorporate home work tasks, weekly tests as well as routine tasks they were accustomed to, but the current ZIMSEC dimension calls for similar tasks and projects for learners nationally. Most of the teachers acknowledged that they require refresher training as regards the supervision of projects, and to ascertain the format before supervising learners’ work. The assertions of teachers in the above finding go hand in glove with the findings of Mpofu (2009), who advocates for training teachers on item construction, marking and moderation of assessment tasks. The researcher feels that teachers should also be workshopped on project mentoring, so as to come out with uniform research projects nationally. Punch (2000) also accepts that project work requires enlightened tutors, who have the capability to mentor learners on topic choice, methodology as well as collection, presentation and analysis of gathered data.

Though cited by a few teachers, effects of large classes seemed to have adverse effects on the CA process, and were exacerbated by cases of absenteeism, transfers, lack of feedback as well as, lack of remedial and enrichment programs. All the teachers highlighted that due to large classes they were handling, it was an uphill battle to adequately supervise all learners, let alone monitor those who were lagging behind with the CA tasks. A finding by Santrock (2006) indicated that when classes are large, that is above the standard teacher-pupil rate of 1:30, it was a mammoth task to carry out CA efficiently. This is consistent with the Zimbabwean scenario, where teacher-learner ratios are as large as 1:60.

It also emerged that due to the volumes of work at the exposure of the learners, and the amount of time expected to be taken by the teacher to preside over the tasks and projects of learners, it was an unmanageable task for teachers to carry out remediation on struggling learners, as well as offering enrichment programs for the gifted. There also appeared to be no adequate time for teachers and learners to have adequate feedback on what has been covered, and how performance on subsequent tasks could be improved. In a finding closely to the Zimbabwean situation, Tan et al. (2006) advises that large classes make it impossible for educators intending to implement CA
to find it a mammoth task to inculcate and develop creativity, enquiring as well as, problem solving skills in learners during research work.

ANALYSIS OF PERCEPTIONS OF TEACHERS AND LEARNERS TOWARDS CA

The main perception highlighted by both teachers and learners as regards CA is that the process is a real burden for both of them. There were indications that before the inception of the CA process, both teachers and learners were already overburdened by assessment tools such as home work, class work, tests, quizzes and puzzles as well as group discussions. This ideally means that introduction of tasks and projects on top of the already existing burden created an unmanageable overload that was difficult to attain. Both stakeholders suggested that some of the assessment tools should be scrapped from the system, to enable learners and teachers to have breathing space. This affirmation correlates with the observation of Quansah (2005), who advises that where CA is to be enforced, there is need by concerned stakeholders to reduce or trim assessment tasks, to make them manageable and serve intended purposes.

In addition, it was manifest from the results that the CA process is time-consuming. In the Zimbabwean set up, ZIMSEC has tirelessly tried to enforce uniformity of CA tasks, and has promises the clientele system that their efforts are going to go through a moderation exercise, a process that requires a large number of manpower and time consuming as well. The strategy of CA was not clear at the time of data collection, but there were indications that a lot of time would be required to supervise, monitor or moderate the assessment tasks. Muluken (2006) and Allousa (2006) suggest that CA requires a lot of time for test construction, supervision, marking of tasks and carrying out of other administrative duties. In the Zimbabwean set up, if there is no revision of assessment modes, there shall be limited time for the teaching and learning situation, as more time is devoted to partaking in CA tasks and projects.

4.7.4 ANALYSIS OF TOOLS COMMONLY USED IN CONTINUOUS ASSESSMENT

The findings of the study also revealed that in Zimbabwe CA was carried out differently as compared to other nations which had carried it out globally. Only two assessment tools, tasks and projects, were in use for the CA process in Zimbabwean schools. Most of the tasks were research in nature, implying that the CA process in Zimbabwe is heavily aligned towards research work. There is no use of other assessment tools like quizzes, puzzles, homework, weekly tests, termly
tests or oral and group discussion. In Chemistry, the tasks and projects are investigative in nature and according to Siggins (2005), these are very useful indeed in promoting innovativeness, research skills, consultative skills, cooperation, problem solving, critical thinking and self discovery. Since this study was carried out at the budding stages of the CA process, it was yet to be established if ZIMSEC would make amends on some of the perceived shortcomings highlighted by both teachers and learners.

4.7.5 ANALYSIS OF TECHNIQUES OF IMPROVING THE IMPLEMENTATION OF CA

Both learners and teachers were awash with mechanisms they construed as suitable in improving the way CA should be undertaken in Zimbabwe. The first call was by educators to have them properly oriented for the CA process. Most educators proved ignorant of what was at stake as regards the issuing, supervision and marking of tasks and projects. They acknowledged that the few teachers who had been invited for workshops on CA by ZIMSEC were not being able to explain all the details expected of them in all learning areas. Some of the teachers also offered that the amount of work entrusted upon them accorded them the status of college lecturers, thus, their remuneration needed to be aligned along those lines. The need to thoroughly train implementers of the CA process, including school managers, is in tandem with the recommendations of Ogunniyi (2004), who insists that adequate teacher work shopping on implementation of the CA process allows schools to partake of its activities on an equal footing.

Furthermore, teachers opined that there was need to reduce teacher-pupil ratios in schools, particularly in Chemistry at Ordinary Level. The large number of learners, coupled with limited resources and the voluminous amount of work that has to be done by learners imply that classes should be kept to minimal and standardized figures. The effect of large classes was posited by Eggen et al. (2003), and Mwamwenda (2011), who indicated that large classes are susceptible to cheating, and make it impossible for the teacher to effectively control the class. In another related finding, it came out that both teachers and learners recommended that the tasks and projects be thoroughly edited and supervised, lest some erroneous material is send to learners.

4.8 SUMMARY
This chapter presented, analyzed and discussed the researcher’s findings in the view of research questions and objectives. Statistical graphs such as pie charts, frequency tables and bar charts were used to present the data that was collected from questionnaires and oral interviews. From the gathered data, it emerged that teachers and learners were still unclear about the ways through which ZIMSEC wanted the CA process to be done. There were numerous irregularities that were unraveled by the study, among them: lack of knowledge by teachers and learners on how to partake in the tasks and projects, limited time at the exposure of teachers and learners, as well as the voluminous nature of activities overloaded on both teachers and learners. Nonetheless, the study revealed that assessment tasks and projects used were correlated to curriculum aims, were inclusive and equitable, were subject to moderation and addressed individual differences.

Again, learners were amused that their exposure to CA tasks improved their participation in Chemistry, eradicated their weaknesses and enabled their teachers to have input on their summative mark. This meant that it is now possible, through CA, to incorporate the teachers in deciding the summative fate of the learner.

The study also established that of all the assessment tools that are usable for the CA process, only project work and tasks in the form of practicals were commonest in Chemistry. These tools serve to promote a wide range of skills not commonly tested during summative evaluation, among them: cooperation, research as well as consultative skills. Though these assessment tools are very crucial, it is worthwhile to note that they are now solely involved in the CA process at the detriment of other assessment apparatus like homework, experimental work, oral questions, quizzes and puzzles. It was not however clear whether ZIMSEC would continue to use only investigative tasks in Chemistry in subsequent CA tasks.

Above all, it was manifest that teachers and learners called for adequate training of all stakeholders involved in the implementation of the CA process. This was seen as the only way through which the CA process would be carried out on an equal footing. It was also recommended that there be thorough revision and editing of assessment tasks used in the CA process, to eradicate all forms of errors that may render these tasks and projects invalid and unreliable. Unfortunately, this study was carried out at the budding stages of the CA process, and there were other issues that were yet to be clarified, especially moderation of tasks, and record keeping.
CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter gives a summary of the entire study. This incorporates the summary of the entire study, the findings obtained by the researcher and the conclusions drawn from such findings, the recommendations proposed based on the findings.
5.2 SUMMARY OF THE STUDY

This study is organized in five chapters. Chapter 1 gives a general outline of the whole study. The study was carried out in 2017, in the Triangle cluster, found in Chiredzi District. A total of 120 participants were used in this study, among them: 100 Chemistry learners and 20 Chemistry teachers. The study sought to find out the perceptions of learners and educators towards Continuous Assessment (CA).

In Chapter 2, the researcher alluded to the ideas of early researchers who aired their sentiments on the issue of CA. Mostly discussed in the Chapter are the tenets of CA, its strengths and weaknesses, its mode of administration in the Zimbabwean setting, as well as the perceptions of learners and teachers towards it. Again, the researcher scrutinized the techniques that can be adopted by teachers, ZIMSEC, school managers and learners in a bid to improve carrying out of CA in Zimbabwe.

Literature review cited the following as benefits of CA: the improvement of teacher methodologies, the improvement of learner participation, thorough preparation for Zimsec summative examinations and the involvement of the classroom practitioner in deciding the summative fate of the Chemistry Ordinary Level learners. Other authorities cited also mentioned that CA allows for: remediation and enrichment of learners, as well as feedback from the teacher to the learners and vice versa. In the same chapter, it also emerged that CA enables learner profiling, and is a communicative tool through which academic proceedings occurring at school could be relayed to parents and any interested stakeholders.

The Literature review also unraveled the nature of CA that previously prevailed in Zimbabwe and elsewhere around the globe, against the nature of CA that was being prescribed by the updated curriculum in Zimbabwe in 2017. It emerged that ZIMSEC was bringing a new dimension, which includes tasks and projects, and does not place much emphasis on school-based assignments like homework, weekly tests, termly tests, quizzes and puzzles, as well as oral questions. Though peculiar, the Zimbabwean format of CA emphasizes research, a professional growth attribute that all learners should wield as they enter the tertiary or informal sector.

To a greater extent, earlier studies mentioned a litany of challenges that may scuttle the smooth implementation of CA in the updated curriculum. It was noted that anxiety and stress in test taking
among learners, reduced contact time between teachers and learners, inadequate training of implementers, as well as the effects of large classes and unexpected events, are chief challenges that may scupper the grassroots implementation of CA. In most countries where CA has been carried out, implementers have always lamented on lack of time, feasibility, lack of proper supervision, monitoring and support, as well as the burdensome nature of CA, as detrimental hazards to the proper implementation of CA.

Above all, Chapter 2 proposes the possible recommendations that can be adopted by various stakeholders to try and improve the face of CA, as well as how implementers can be assisted to drive home their objectives with much ease. It also emerged that: proper administration of times and tasks for CA, constantly redesigning and reorganizing CA tasks, moderation of CA tasks, reducing the number of CA tasks, and adequately training personnel responsible for implementing CA, could be instrumental mechanisms of motivating learners and teachers to embrace CA positively. To a lesser extent, learners were urged to do corrections, and schools are urged to maintain standard teacher-pupil ratios.

In Chapter 3, the researcher scrutinized the methods and techniques that he adopted to gather data for this study. The researcher used questionnaires, oral face-to-face interviews as well as observations to gather data for the study. Questionnaires were administered to teachers, oral interviews were carried out on learners, while observations were done on the general ongoings prevalent in the schools used in this study.

In Chapter 4, data collected was presented on statistical tables such as: pie charts, bar charts, as well as frequency distribution tables. The researcher came out with the following findings:

5.3 FINDINGS AND CONCLUSIONS

The researcher came out with the following findings:

5.3.1 CA was being hastily implemented, hence the negative perception by both teachers and learners. The study revealed that had there been widespread consultation and brainstorming of the CA process, stakeholders like teachers and learners would have embraced it with a positive mind.
5.3.2 It also emerged that learners were joyful that CA would make it possible for school-based marks to be part of their summative assessment. The learners felt that the opportunity given to teachers to have input in the assessment of learners is an indication that ZIMSEC Examinations alone cannot be used to gauge a learner’s overall performance in a span of at least two years.

5.3.3 The study also found out that there are rooms for loopholes in the process of carrying out assessment tasks and projects. There are no mechanisms in place to ensure that learners do not duplicate or recycle assignments on assessment tasks, or projects. Thus, there needs to be strict supervision, monitoring and support from ZIMSEC, if the CA process is to materialize.

5.3.4 In addition, all the respondents consented that a lot of contact time between teachers and learners is lost during the CA process, as attention is shifted from the normal teaching and learning scenario that has been prevalent in schools, to the large volume of assessment tools introduced to complement or facilitate the CA process.

5.3.5 Moreover, the gathered data showed that it is highly unmanageable for a learner to carry out up to ten research projects, in addition to the tasks and weekly exercises, homework, quizzes and puzzles, as well as termly tests, among many assessment tools previously used to assess learners. This means that the quality of work produced shall be compromised since there will not be adequate time to carry out the tasks, projects as well as the wide range of assessment tasks commonly carried out in Chemistry.

5.3.5 Other cited difficulties were, among others, lack of apparatus, too difficult investigative tasks and projects (e.g. design of carbon dioxide filter in Form three Chemistry), unsupportive parents, ZIMSEC website difficult to access, format of presentation of tasks and project not clear and teacher pupil ratios hampering tasks marking (classes too large).

5.4 RECOMMENDATIONS FROM THE STUDY

5.4.1 Since the study established that the majority of implementers of the CA process are not fully knowledgeable about how to carry out intended duties, the Ministry of Primary and Secondary Education should run workshops nationally, so as to equip teachers and learners with pre-requisite skills of how to implement CA effectively.
5.4.2 Since it was noticeable that it is an uphill battle for learners to carry out project work in all the facets offered in the school, ZIMSEC should ensure that they allow learners to select and carry out one project from the list of academic subjects they partake of. The participants argued that the learners may do all the given tasks in various subjects, but when it comes to project work, they should specialize in a learning area.

5.4.3 Since it emerged that the CA process is susceptible to cheating and duplication of work by learners, teachers as well as officials from ZIMSEC are encouraged to guard against any forms of malpractices that may be detrimental to the outcomes of CA. This can be done by adequately supervising, monitoring and moderating assessment tasks used in Chemistry.

5.4.4 Since it was found out that some of the assessment tasks could have gross errors due to the limited time given to structure them, it remains ZIMSEC’s sole responsibility to thoroughly edit assessment tasks before they reach teachers and learners with costly errors. There must be adequate personnel to proofread the assessment tasks, and make sure they are compatible with the level being assessed.

5.5.5 The study found out that it was not feasible for learners to carry out projects of all the subjects they are learning, hence the researcher recommends that learners should be allowed to carry out a project with an interdisciplinary perspective that integrates various subjects (both contents and abilities). In Chemistry a STEM based project could be a good example of a project. This will allow for the consolidation of innovativeness, collaborative attributes, decision making, as well as consultative skills.

5.5 RESEARCH QUESTIONS GENERATED BY THE STUDY

Though the researcher managed to answer research questions successfully, other questions for further study emerged:

5.5.1 How do parents and institutions of high learning perceive CA?

5.5.2 How does CA in Zimbabwe differ from CA carried in other African countries?
5.5.3 What role should be played by policy makers in the implementation of the CA process in Zimbabwe?

REFERENCES


Cunningham, D. J. (1992). Beyond Educational Psychology: SDteps Toward an Educational Semiotic. Educational Psychology Review. 


Webster’s Dictionary
RESEARCH INSTRUMENTS

APPENDIX I : QUESTIONNAIRE FOR TEACHERS

My name is Magweva Clemence, and I am studying for a Masters Degree in Chemistry with BUSE. As part of the requirements of the aforementioned course, I am carrying out a research to ascertain the perceptions of teachers and learners on the use of Continuous Assessment in Chemistry at Ordinary Level. I kindly request you to fill in the questionnaire below to the best of your knowledge. Please be at liberty to air out your sentiments, and be assured that all the information to be collected using this questionnaire shall be kept confidential and solely used for educational purposes.

SECTION A: DEMOGRAPHIC DATA
1. **AGE:**

   - BELOW 30 YEARS [ ]
   - BETWEEN 30 AND 40 YEARS [ ]
   - BETWEEN 40 AND 50 YEARS [ ]
   - ABOVE 50 YEARS [ ]

2. **EDUCATIONAL QUALIFICATIONS:**

   - CERTIFICATE IN EDUCATION [ ]
   - DIPLOMA IN EDUCATION [ ]
   - FIRST DEGREE IN EDUCATION [ ]
   - MASTERS IN EDUCATION [ ]

   OTHER SPECIFY ........................................................................................................................................................................

3. **TEACHING EXPERIENCE:**

   - BELOW 5 YEARS [ ]
   - BETWEEN 5 AND 10 YEARS [ ]
   - BETWEEN 10 AND 15 YEARS [ ]
   - ABOVE 15 YEARS [ ]

**SECTION B: KEY**

Use the key below for:

**SA**- Strongly Agree;
**A**- Agree;
**U**- Undecided;
**D**- Disagree;
**SD**- Strongly Disagree

NB. You may write additional information on the spaces given below each research item.
1. What do you understand by CA?

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ELABORATE IF NECESSARY

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2. How often do you use the following tools in Continuous Assessment?

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<thead>
<tr>
<th>TOOL</th>
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<th>RARELY</th>
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<td>Class work</td>
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<td>Homework</td>
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<td>Group work</td>
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<td>Fortnightly tests</td>
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<td>Experiments</td>
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<td>Projects</td>
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<tr>
<td>Quizzes and puzzles</td>
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<td>Oral questions</td>
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<td>End of term exams</td>
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OTHER (SPECIFY)

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80
3. What do you think are the benefits of Continuous Assessment to learners?

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<th>BENEFIT</th>
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<tbody>
<tr>
<td>1. CA improves learner participation</td>
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<td>2. CA avoids examination malpractices</td>
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<td>3. CA uses school-based marks to aid summative marks</td>
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<td>4. CA eradicates learners weaknesses</td>
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<td>5. CA allows for teacher-pupil feedback and vice versa</td>
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<td>6. CA allows for remedial and extension work</td>
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<td>7. CA gives reports to parents on children’s performance</td>
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<td>8. CA enables profiling of students’ work or progress</td>
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4. What are the benefits of Continuous Assessment to teachers

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<td>1. CA leads to improvement of teachers’ methods</td>
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<td>2. CA includes teacher in assessing learners</td>
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<td>3. CA allows for teacher-learner feedback and vice versa</td>
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<td>4. CA allows for remediation activities</td>
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<td>5. CA promotes extension work for the gifted</td>
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<td>6. CA relays messages between teachers and parents</td>
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<td>7. CA provides information for profiling learners</td>
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5. What challenges do teachers face when using Continuous Assessment?

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<th>CHALLENGES</th>
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1. Use of sub-standard assessment items

2. Lack of uniformity on test items

3. Inadequate training on use of CA

4. Lack of moderation on assessment tasks

5. Competition for control of students

6. Limited teacher-pupil contact time

7. Dealing with large classes

OTHER (SPECIFY)

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8. What challenges do learners face when using Continuous Assessment?

CHALLENGE

SA  A  U  D  SD

1. Anxiety and stress of test taking

2. Reduced contact time with teachers
3. Lack of remedial and extension work
4. Exposure to non-moderated activities
5. Lack of exposure to project work
6. Prevalence of unexpected events
7. Large classes

OTHER (SPECIFY)

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8. How do you perceive Continuous Assessment?

PERCEPTION TOWARDS CA

1. Continuous assessment is time consuming
2. Continuous assessment induces uneasiness in learners
3. Continuous assessment in not practical in Zimbabwe
4. Continuous assessment needs adequate supervision

5. Continuous assessment needs adequate monitoring

6. Continuous assessment needs support from ZIMSEC

7. Continuous assessment is a burden for teachers

OTHER (SPECIFY)

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9. What strategies can be adopted to improve the use of Continuous Assessment in Ordinary Level Chemistry?

WAY OF IMPROVING CA

1. Putting more emphasis on project work

2. Redesigning content for CA

3. Moderation of CA tasks

4. Reduced number of CA tasks on learners

5. Maintaining recommended teacher-pupil ratios
6. Adequate teacher training on implementing CA
7. Encouraging learners to do corrections
8. Proper administration of CA tasks and timelines

OTHER (SPECIFY)

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APPENDIX II:

OBSERVATION GUIDE

The researcher made the following observations as regards the circumstances surrounding use of Continuous Assessment in the sampled schools. The main aim of carrying out the observation guide was to observe and record other events constituting to the implementation of CA indirectly. These are listed below.

1. TIME ALLOCATED FOR CHEMISTRY ON THE TIMETABLE
2. CLASS SIZES
3. TEACHER-PUPIL RATIO
4. NATURE OF LABORATORIES AT THE SCHOOL (SIZE, STATE)
5. QUANTITY OF APPARATUS AND CHEMICALS IN LABORATORIES
6. QUALITY OF APPARATUS AND CHEMICALS IN LABORATORIES
7. FREQUENCY OF SUPPLY OF LABORATORY EQUIPMENT AND CHEMICALS
8. ASSESSMENT TOOLS USED BY CHEMISTRY TEACHERS
9. TEACHERS’ RECORDS
10. PROJECT WORK

ADDITIONAL COMMENTS

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APPENDIX III:

INTERVIEW GUIDE FOR LEARNERS

The main objective of this interview guide is to gather information on benefits and challenges of CA, perceptions of learners towards CA, as well as mechanisms of improving CA in Chemistry.

1. **How old are you?**
2. Are you a Chemistry student?
3. Are you aware of Continuous Assessment?
4. Do you have ample textbooks to use in Chemistry?
5. How do you carry out Chemistry experiment?
6. How many learners are in each Chemistry class?
7. How frequent does your teacher use the following assessment tools?
8. How do you hope to benefit from Continuous Assessment?
9. What challenges do you face when Chemistry teachers use CA to assess you?
10. How do you personally view the use of CA in Chemistry learning?
11. How can CA be improved in the assessment of Ordinary Level Chemistry?