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Impact of the Use of Enhanced Assessment Items on the Continuity of the Teaching and Learning Process in the Physical Sciences

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Abstract: This studywascarried out in order to evaluate the impact of the enhanced assessment items on the continuity of the teaching and learning process in the Physical Sciences. To achieve this goal, we first developed the improved items by establishing assessment topics under the theme of the Archimedes thrust; some containing improved items and others containing classic items. After that, we confronted learners with their treatment and subjected the results obtained from these assessments to statistical tests to verify the relevance of the results. We also conducted surveys of assessed learners and teachers of Physical Sciences to obtain their views on this innovation in item formulation. These evaluations show that the use of the improved items really allows the continuity of the teaching and learning process, because the results of the statistical tests are in agreement with the theoretical results obtained by the literature review. From these surveys, it appears that the teachers of Physical Sciences as well as the learners assessed positively appreciate this innovation in the formulation of the items. The use of enhanced items in summative assessment makes it formative.
Keywords: pedagogical continuity, Enhanced assessment item, Assessment, Archimedes thrust.

Résumé: Cette étude a été réalisée dans l'objectif d'évaluer l'impact des items d'évaluations améliorés sur la continuité du processus d'enseignement-apprentissage en Sciences physiques. Pour atteindre cet objectif, nous avons d'abord élaboré les items améliorés en établissant des sujets d'évaluation sous le thème de la poussée d'Archimède ; contenant pour certains des items améliorés et pour d'autres des items classiques. Après cela, nous avons confronté des apprenants à leur traitement et soumis les résultats obtenus de ces évaluations à des tests statistiques pour vérifier la pertinence des résultats. Nous avons également mené des enquêtes auprès des apprenants évalués et auprès des enseignants de Sciences physiques pour connaître leur avis à propos de cette innovation dans la formulation des items. Il ressort de ces évaluations que l'usage des items améliorés permet véritablement la continuité du processus d'enseignement-apprentissage, car les résultats des tests statistiques sont en accord WITH les résultats théoriques obtenus par analyse documentaire. De ces enquêtes, il ressort que les enseignants de Sciences physiques ainsi que les apprenants évalués approuvent cette innovation dans la formulation des items. L'usage des items améliorés dans l'évaluation sommative la rend formative.
Mots clés: continuité pédagogique, Item d'évaluation amélioré, Évaluation, Poussée d'Archimède.

Introduction

It is now widely accepted that the use of participatory methods is strongly recommended for successful school education. These methods, which put the learner at the centre of learning process, allow him to build his knowledge.In this context, the teacher is only a guide who shows the way and the learner walks the path indicated. This view is supported by J. Tardif (1993, p.27) for whom "In current pedagogy, the student is the central actor in the learning process. His active role in the teaching and learning sequence is to gradually build up knowledge himself." To achieve his teaching mission, the teacher has several techniques and tools to get the message across and motivate learners to work harder. Examples include assessments, including formative assessments through tutorials and summative assessments through assignments and quarterly exams. However, not everything always goes according to plan, the difficulties related to the working conditions (overcrowded class, lack of laboratory, non-electrified class, lack of teaching materials, etc.), the chaos of digressive learners, the dense program of this discipline, the lack of time to do everything in class, the delay in the progress caused by various personal problems or by certain academic constraints. In the Republic of Congo, teachers generally use interactive technique to teach. The large number of learners in a classroom is a real time management problem in all public schools. In these conditions, the teacher cannot go further by exploring items to be taught.Exchanges with learners or between learners are often interrupted in order to be able to move forward on the school program, despite the relevance of the subjects mentioned. The quality of the courses is diminished

and learners miss out on certain useful information in their daily lives. While these problems are true for all teachers, they are particularly stressed for those who teach physical sciences in middle school as well as in high school. In the search for solutions likely to make up for the missed or not transmitted information to learners, the present research work tackles on the issue of formative and summative assessment through the quality of the assessment items made available to them. It is with this in mind that we study "impact of the use of enhanced assessment items on the continuity of the teaching and learning process in the Physical Sciences".

Assessment is addressed here in its learning aid or pedagogical dimension as mentioned by M. Drame et al (2021, p. 20). This is an assessment "for learning" and not just an assessment for "learning". "This assessment is an integral part of the teaching and learning process, it empowers learners to assess their performance" (R. Howe and L. Menard, 1993, p.6) and "effectively improves learning" (P. Black and D. William, 1998, p.61). Several authors have addressed pedagogical continuity at school, including G. Charlot (2020), S. Cadiou and P. Mothes (2020), A. Chiry (2020) ... However, none of them have examined this possibility from an assessment perspective using the enhanced assessment items. Indeed, we want to use the tutorial training topic as well as the summative assessment topic as tools to help learners build themselves as they process knowledge topics and continue to learn. These items are designed so that as learners process the topic, they either discover new knowledge, complementary to the course, or a repetition of the information already received during the course. It is therefore a question for the teacher to use creativity to construct the items that we have called "improved items" in order to complete the information not distributed in class during the course sessions due to lack of time for the learners to themselves to be aware of the shortcomings in their reasoning or lack of knowledge to then abandon them and adhere to a more authentic and true knowledge.

In order to better understand the impact of the use of enhanced assessment and training items on the continuity of the teaching and learning process in the Physical Sciences, this study proposes to answer the following research questions: Can the use of enhanced assessment items significantly ensure the continuity of the teaching and learning process in the Physical Sciences? In addition to this main question, there are other so-called secondary research questions, namely: is it possible to ensure the continuity of the teaching of the Physical Sciences through the improved assessment items? Can learners make meaningful learning in the Physical Sciences through the enhanced assessment items? How is this improvement in assessment items perceived by teachers and learners?

This study continues on the basis of four hypotheses in accordance with the research questions presented above. First, the continuity of the teaching and learning process in the Physical Sciences can be significantly ensured by making use of the enhanced assessment items. Secondly, it is possible to ensure the continuity of the teaching of a large number of concepts in the Physical Sciences through the use of enhanced assessment items. Third, learners can make meaningful learning in the Physical Sciences through the use of enhanced assessment items. Fourthly, teachers and learners perceive positively the use of the enhanced assessment items as an innovative means of continuity of the teaching and learning process.

This study was conducted with the aim of contributing to the improvement of the quality of learning across all school cycles through the use of this innovation in the writing of assessment items. The general objective of this study is "to evaluate the impact of the improved assessment items on the continuity of the teaching and learning process in the Physical Sciences. However, in a specific way, this study aims to: verify, on the basis of an experiment, the possibility of ensuring the continuity of the teaching of Physical Sciences through the use of improved assessment items; examine the contribution of enhanced assessment items on learners' learning in the Physical Sciences; To assess the acceptance by teachers and learners of the pedagogical innovation reflected in the use of the improved assessment items.

1. Methodology

In order to test our research hypotheses, we carried out experimentation, literature review and field surveys at the level of teachers and learners using questionnaires. The combination of these three data collection methods allows this study to be classified as a mixed-method study.

1.1. Experimentation with the introduction of enhanced assessment items

To carry out this experiment, the learners had to be divided into two (2) groups, including a control group and an experimental group. Four (4) assessment subjects were also required, two (2) subjects for learners in the control group and two (2) additional subjects for learners in the experimental group. These subjects are referred to respectively: WITHOUT Training Subject (WITHOUT TUTRIAL) and WITHOUT Subject for the control group. WITH Training Subject (WITH TUTRIAL) and WITH Subject for the experimental group. It should be noted that only the WITH Training Topics (WITH Topics) and WITH Subject contain improvements or innovations in the formulation of the assessment items. The WITHOUT Training Topics are used as part of the formative assessment of learners. The WITHOUT and WITH Topics are used for the summative assessment of

learners. All these subjects are identical two (tutorialWITHOUT and tutorial WITH) by two (subjects WITHOUT and WITH) in terms of form, number of items and concepts covered.

1.1.1. Tutorial sessions

The tutorial sessions took place in two phases, one of which was for each group of learners. These tutorial sessions were led by teachers from the selected classes. The distribution of learner groups was made according to the availability of learners and teachers based on their respective class schedules on the day of the tutorial session. The purpose of the tutorial sessions was to prepare the learners for the various assessments. By participating in this tutorial session, the learners had the opportunity to reimmerse themselves in the course on the Archimedean thrust and to relearn the methods of solving the exercises on the Archimedean thrust, the tricks of calculations and the presentation of the results using a scientific calculator. Learners in the control group were subjected to the WITHOUT tutorials and those in the experimental group were subjected to the WITH tutorials.

1.1.2. The Summative Evaluation Series

One day after the tutorial sessions for each group, a series of evaluations took place for 1h30 each. To ensure the supervision of these learners, the teachers involved were unknown to the learners. Learners in the control group were given two (2) successive assessments (assignments) with a 30-minute break between the two (2) summative assessments (assignments). The first evaluation focused on the WITHOUT topic and the second evaluation focused on the VSLA topic. Learners in the experimental group were given a single assessment (assignment) on the WITH topic. The purpose of the assessments offered to the learners was to compare the scores obtained by the learners in each group to the different assessment subjects. The results obtained were valued, compared and then subjected to statistical tests to demonstrate whether there was a significant difference in the learners' work for the two subjects and in the two groups. This comparison was made after the collection and rigorous correction of the learners' papers based on the answers that we had previously established for each assessment subject.

1.2. LiteratureReview

Regarding the literature review, the emphasis was placed on the comparative analysis of the different training topics (WITHOUT and WITH) and summative evaluation (WITHOUT and WITH) in relation to the course. These are the topics proposed respectively during the tutorial session and during the series of summative assessments (homework) for learners in the control and experimental groups. This analysis was carried out in order to highlight the potential of the improved subjects and tutorials in terms of pedagogical continuity.

1.3. Field Investigations

As for the field surveys, they were sent to the teachers of the Physical Sciences of the high school teaching in various public schools as well as to the learners present during the series of evaluations.

1.3.1. Survey of Physical Science Teachers

The survey of Physical Sciences teachers was made possible by a semi-structured questionnaire. This questionnaire was randomly distributed to Physical Sciences teachers in various high schools in Brazzaville. Some of them completed and submitted their questionnaire simultaneously, while others, on the other hand, completed their questionnaire at their own pace at the time they wished. These surveys allowed us to find out if these teachers had ever been confronted with problems of delay in the progress of their program as well as the causes and means of catching up on this delay, to have an idea of how they usually compose their subject, to explain to them the essence of the enhanced assessment items and finally to know their opinion on the use of these items. Each questionnaire distributed to teachers was accompanied by a copy of the WITHOUT and WITH training topic.

1.3.2. Learner Survey

The survey of learners in both groups (control and experimental) was carried out using a questionnaire developed specifically for this study. The assessed learners spontaneously completed and handed in their questionnaire to the room supervisors immediately after completing the assessment. These surveys allowed us to find out their opinion on the enhanced assessment subjects that were offered to them compared to their usual or traditional assessment subjects.

1.4. Population and Sample

For this study, the population is composed of objects (documentary corpus) and men. As far as the documentary corpus is concerned, it consists of the training and evaluation subjects as well as copies of the various summative evaluations. As for the human population of the study, it is made up of Physical Sciences teachers from various public high schools and second C learners from the Massengo Science High School. It is important to note that, by chance, the sample of the control group (129 learners) is made up of the school's brightest learners in the second year following the results of the 1st and 2nd term assessments (classes recomposed according to the best academic results). And, the experimental group is composed of the least brilliant learners (129 learners) of second (classes recomposed according to poor academic performance). The choice of learners at the second C level is justified by the nature of the theme of the course covered, i.e. the Archimedean thrust. This course is scheduled at the beginning of the third term in the second C class, which coincided perfectly with the period in which the study was conducted. Details of these samples are placed in Table 1 below.

Table 1: Summary of the Study Sample

Documentary corpus		
Documentarysamples		Workforce(n_i)
Training Topics	WITH	1
	WITHOUT	1
Assessment Topics (Assignments)	WITH	1
	WITHOUT	1
Learners' copies of the various summative assessments	Learners' copies of the control group on the topic WITHOUT	129
	Copies of the focus group learners on the VSLA topic	129
	Learners' copies of the experimental group on the topic WITH	129
Population humaine		
Samples		Workforce(n_i)
Middle and high school physics and chemistry teachers surveyed		20
Secondary C learners from the Massengo Science High School surveyed		253

Source: Personal construction

2. Results and Discussion

2.1. Results of the experiment

The results of the different evaluation scores of the control and experimental groups carried out during the experiment are placed in Table 2 below.

Table 2: Summary of the results of the experiment

Variables	WITHOUT control group	VSD control group	Experimental group
Success Rate	87,59%	100%	100%
Average rating	13,67	15,57	14,85
Note maximale	18,75	19,50	19
Minimal notes	3,75	10,50	10
Extent	15	9	9

Source: Results of statisticalanalysis

Analysis of Table 2 shows that all calculated indicators are superior in the experimental group compared to the WITHOUT control group. In fact, only 87.59% of the learners in the control group obtained a score greater than or equal to ten (10) on the subject WITHOUT despite the fact that this sample was made up of the best learners from the second-level institution. However, the learners in the experimental group of the school's lowest-brighteners all scored ten (10) or higher on the WITH topic. The difference between scores (range) is smaller in the experimental group (9) compared to the control group at the WITHOUT subject (15). This is the case for the arithmetic means of the two (2) groups. Nevertheless, the trend of the indicators reverses slightly after the control group undergoes the second assessment on the VSLA subject.

A statistical analysis of the different means by ANOVA concludes that these results are very highly significant with a p-value of 1.40.10-8. The Student's test, the results of which are presented in Table 3, revealsthat:

- The mean of learners in the control group on the WITH subject is significantly higher than the mean of learners in the control group on the WITHOUT subject with a confidence level for a one-sided significance test of 100% (Test 1);
- The mean of learners in the control group on the subject of WITH is significantly higher than the mean of learners in the experimental group with a confidence level for a one-sided significance test of 99.63% (Test 2);
- The mean of learners in the experimental group is significantly higher than the mean of learners in the control group on the subject WITHOUT with a confidence level for a one-sided significance test of 99.98% (Test 3).

Table 3: Student'sStatistical Test Results

Test 1	Test 2	Test 3
Control groups with WITHOUT and VSLADE subjects	VSLA and experimental control groups	WITHOUT and Experimental Subject Control Groups
T-value = - 5.71	T-value = 2.70	T-value = - 3.56
Confidence level: 100%	Confidence level: 99.63%	Confidence level: 99.98%

Source:Results of analysis

These different results demonstrate that the use of improved items in the training and evaluation subjects truly allows learning, because there is an increase of 12.41% in the admission rate in the control group which goes from 87.59% on the subject WITHOUT to 100% on the subject WITH. In addition, the admission rate in the experimental group (subject WITH) is also 100% despite the low level of learners in this group.

If learners' results have been improved, it is because they have made fewer mistakes in the sense of J.P. ASTOLFI (1997, p.19). Indeed, for whom: "mistakes conceived as failures in students' learning and referring to defects (lack of work, ability, motivation, etc.) or consequences of the ineffectiveness of the teaching given". This decrease in learners' errors is therefore a testament to their learning, because through the treatment of the WITH subject, there has been training. The improved topics allowed them to take their knowledge to the next level. Improved subjects clearly have a formative function since: "formative is any assessment that helps the pupil to learn and develop, in other words, that participates in the regulation of learning and development in the sense of an educational project" (P. Perrenoud 1991, p.50).

This component of learners' learning through the enhanced topics (training and assessment) is sufficient evidence that the educational function of formative assessment in these summative assessment topics has actually been fulfilled. Since:

> Formative assessment is a continuous assessment process aimed at guiding students in their school work, identifying their difficulties in order to help them, and giving them the means to progress in their learning. It is oriented towards immediate pedagogical assistance to the student and is linked to continuous judgment to provide feedback and effective corrective teaching (J.P. Cuq, 2003, p.9).

2.2. Outcome of the literaturereview

The triple comparison made between the course received by the learners, the traditional training and assessment topics and the training and enhanced evaluation topics revealed that:

- The tutorialWITH contains 25 additional pieces of information in relation to the course and the tutorialWITHOUT tutorials;
- The WITH Topic contains 23 additional pieces of information in relation to the course and the WITHOUT topic.

The analysis of the training and evaluation topics compared to the course received by the learners proves that the use of the improved items in the training and summative assessment topics in the Physical Sciences does indeed allow for a continuity of the teaching process. It is therefore possible to ensure the continuity of the teaching of a large number of concepts in the Physical Sciences by the use of the improved assessment items, being that:

> Pedagogical continuity aims to ensure that a learner continues to learn wherever he or she is, through tools such as textbooks, digital tools and resources created by teachers or trainers, among others. These tools also make it possible to maintain a link between the learner and the trainer throughout the learning process (https://www.glowbl.com).

Indeed, it was possible to insert 39 additional pieces of information into the tutorials and the subject WITH, i.e. new information outside the course as illustrated in Table 4. However, it should be noted that some of the information on the WITH training topic is also present on the WITH topic (9 pieces of information in common).

Table 4: Illustration of the insertion of information in the tutorial items and subject

Topics	WITHOUT	WITH
Tutorial	A pupil of the second year of secondary school wants to know the value of the Archimedean thrust that water could exert on a steel tank, with a rectangular base, a mass of 400 kg, a length of 4 m, a width of 1.5 m and a height of 4 m. 1) Calculates the volume of this tank. 2) Calculates the density of this tank. 3) Say whether or not this tank can float on seawater. 4) Calculates the weight of this tub. 5) Deduct the value of the Archimedean thrust exerted by the seawater on this tank. 6) Calculates the submerged volume of the tank. We will take g = 9.81N/Kg and = 1024 Kg/ $\rho_{em}\, m^3$(density of seawater)	Reading his lecture on the Archimedean thrust, a student in the second C learns that for any floating body, π_a=P. Based on his course on the density of bodies, he is able to understand the fact that a giant iceberg partially floats on the surface of the Arctic Sea and that its density is =910 Kg/ is lower than that of seawater. However, he does not understand how a steel-hulled ship floats on water given that the density of steel = 8000 Kg/ is greater than that of seawater. His teacher explains that boats are built in such a way that they are hollow inside and occupy a large volume. This considerably decreases the density of the whole to the point that it becomes less than that of water. He therefore decided to verify this conclusion and therefore had a steel tank, rectangular base, mass 400 Kg, length 4m, width 1.5m and height 4m.$5^e \rho_g m^3 \rho_a m^3$ 1) Calculate the volume of this tank using the formula v = L.$\times \ell \times h$ 2) Gives the formula for the density of a body in relation to its mass m and its volume v and then calculates the density of this tank.ρ 3) Say whether or not this tank can float on seawater. 4) Gives the formula for the weight P of a body in relation to its mass m and the intensity of gravity g and then calculates the weight of this tank. 5) Use the flotation relation to derive the value of the Archimedean thrust exerted by seawater on this tank. 6) Indicates the formula for the submerged volume in relation to the Archimedean thrust, the density of the seawater and the intensity of gravity g and then calculates the submerged volume of the tank.$\pi_a \rho_{em}$ We will take g = 9.81N/Kg and = 1024 Kg/$\rho_{em}\, m^3$ (density of seawater)
To have to	There are two containers. One contains water with a density = 1000 Kg/ ρ_e, the other mercury with a density m^3= 13600 ρ_mKg/. In each container, a brass screw with a mass of 0.0252 Kg is inserted, bearing in mind that this screw displaces a volume of 3 when it completely immerses the water.$m^3.10^{-6}m^3$ 1) Calculates the weight of this screw. We give g=9.81N/Kg (1.25 pts) 2) Calculate the Archimedean thrust exerted by water on this screw. (1.25 pts) 3) The screw does not float on water. Tell us why. (0.75 pts) 4) Deduct the value of the	A Second C student wants to understand why a steel-hulled ship floats on water even though a block of steel of the same weight is sinking in the same liquid. His teacher tells him that a body floats on a liquid when the Archimedean thrust exerted by the liquid on that body is equal to the weight of that body, because when it floats, its apparent weight cancels out. To better experiment with this, he has two beakers, one containing water with a density = 1000 Kg/ ρ_e, the other mercury m^3 with a density = 13600 Kgρ_m/ and two identical brass screws with a mass of 0.0252 Kg each.m^3 Knowing that this screw moves a volume = 3. when fully immersed in water.$v10^{-6}m^3$ 1) Give the formula for the force at a distance that the earth exerts on this screw in relation to its mass and the intensity of gravity, and then calculate the weight of this screw. We give g = 9.81N/Kg. (1.25 pts)$P(Poids)mgP$ 2) Knowing that the Archimedean thrust also designates the weight of the volume of the liquid displaced; gives the formula for the Archimedean thrust of a body in relation to

	Archimedean thrust that mercury can exert on this screw so that it floats on the surface of the mercury. (0.5 pts) Calculates the volume of mercury displaced.(1.25 pts)	its density, the intensity of gravity, and the volume of the liquid displaced, and then calculates the Archimedean thrust exerted by water on this screw. (1.25 pts)$\pi_{a1}\rho g v \pi_{a1}$ 3) Compare the value of the weight of this screw and the calculated Archimedean thrust and then give a conclusion as to whether or not this screw floats on water. (0.75 pts)$P\pi_{a1}$ 4) Deduct the value of the Archimedean thrust exerted by the mercury on this screw so that it floats on the surface of the mercury. (0.5 pts)π_{a2} 5) Use the Archimedean thrust formula of a body in relation to its density, the intensity of gravity and the volume of the liquid displaced, and then calculate the volume that the brass screw moves when immersed in a container containing mercury$\pi_{a2}\rho g v^{'}, v^{'}$.(1.25 pts)

Source: Results of personalanalysis

2.3. Results of surveys of teachers of Physical Sciences

80% of the teachers consulted feel that they do not have enough time to properly explain a course or to emphasize or teach a concept well in terms of the amount of information provided. There are many reasons for this, and the various ways in which this information is reconciled are listed in Table 5 below.

Table 5: Summary of responses from teachers who do not have access to explanation time

Reasonsgiven	n_i	%
Learners' tardiness and absences from the course	2	10
The density of the school curriculum	10	50
The Existence of Public Holidays	1	5
Lack of level of learners	3	15
Treatment of application exercises	2	10
Low hourly volume	2	10
Techniques used		
Summarize the additional information in the form of a quiz with examples at the beginning of the next course before or at the time of the knowledge check	5	25
Organize a remedial course dedicated to the addition of additional information	2	10
Ask learners to research additional information	2	10
Propose application exercises at the beginning or end of the next courses to provide explanations on additional information	5	25
Organize a tutorial session for the course and take the opportunity to catch up on this information	5	25
Nothing special	1	5

Source: Personalsurvey

An examination of Table 5 indicates that the density of the curriculum is the main reason why teachers do not consciously focus on certain concepts in terms of explanation and the amount of information to be made available to learners. Offering application exercises at the beginning or end of the next class to explain the additional information is the most used technique to catch up on this information in the next class session. However, doing so only shifts the problem since part of the time of the next class is devoted to remedial work. It is well known that teaching time is a determining factor in learning. Indeed, "in general, researchers find positive correlations between the amount of teaching time and output" (M. Crahay, 2000, p.10). Similarly, T. Husén (1972, p. 11) "admitted that a 50% increase in total schooling, for example, would result in a 50% increase in the knowledge retained by students".

With regard to the desirability of catching up on information omitted from the lesson, all teachers interviewed were interested in a possible way to continue their teacher or to catch up on some information that may be useful to learners. After reading the WITH subjects (tutorials and homework) attached to the questionnaire, the teachers consulted all appreciated this innovation in the writing of the evaluation items. They have compiled a list of benefits that they believe are derived from this innovation. These benefits are documented in Table 6.

Table I:Benefits What may result from the use of the improved items

Possible benefits		%
Learners' better understanding of the course	2	10
The complete achievement of the set objectives and the completion of the programs by the teachers	2	10
The ease of understanding of the subject for learners thanks to the insertion of elements related to daily life	2	10
The learners' better assimilation of the concepts taught by the teacher during the course	2	10
The application of the concepts related to the course to the learners	2	10
The continuity of the act of teaching learning by teachers and learners	2	10
Learners' good resolution of exercises	2	10
Remediation of the course by the teacher	2	10
Comprehensivelearner training	2	10
Reduction of gaps and difficulties among learners	2	10

Source: Personalsurvey

It is true that "a well-posed problem is half solved" (H. Bergson), an assessment item must contain enough clear information for its resolution and also respect the structure of an assessment item as proposed by C. P. Louyindoula et al (2018, p.163) with the 5 components:

> the stimulus or context, the data, the task, the instruction, and the correction key. If the key component of correction only occurs when the students correct the papers, the other 4 components must be included in the various items offered to the learners.

2.4. Learnersurveyresults

Learners were interviewed following the experiment (homework). However, five (5) learners in the experimental group did not deign to complete the questionnaire. As a result, the total number of respondents is two hundred and fifty-three (253) instead of two hundred and fifty-eight (258). Learners' responses to the various questions are shown in Table 7 below.

Table 7: Summary of learners' responses to questions 1 to 4

Questions	Yes		Not	
	n_i	%	n_i	%
As a second-grade student who regularly attends classes, do you understand the Physical Sciences course?	149	58,89	104	41,11
Are the items in the Physical Sciences assessment topics that you are usually offered a blatant link to the course?	221	87,35	32	12,65
Do the items in the Physical Sciences assessment subjects that you are usually offered have a blatant link to everyday life?	84	33,20	169	66,80
Do the items in the Physical Sciences assessment topics that you are usually offered give you a better understanding of the subject?	121	47,82	132	52,18

Source: Personalsurvey

58.89% of the learners surveyed believe that they understand the physical science course. In this result, it is necessary to put things into perspective, because 50.89% of the learners who answered Yes are those in the control group, i.e., the brightest learners in the institution for the level considered. 87.35% make a clear link between traditional assessment subjects and the courses they receive. However, only 33.20% of learners, all in the control group, were able to make a connection between the subjects of classical physical science assessments and everyday life. Only 47.82% of learners, including 46.24% in the control group, think that the usual Physical Sciences assessment subjects offered provide a better understanding of the subject to be covered. All these results suggest that almost half of learners struggle in the physical sciences. Indeed, of all the subjects taught in middle or high school, the physical sciences are among the difficult, as G. NoupetTatchou (2004, p.14) thinks about the Senegaleseschoolenvironment:

> Among the scientific disciplines, the physical sciences are considered to be the most difficult discipline for many people (students, teachers of all disciplines). They are considered to be a "cut-throat" discipline, i.e. the one that causes the most failures in exams in scientific subjects.

64.03% of learners prefer the WITH topic over the WITHOUT topic. These learners justify their choice with the following words or qualifiers: *affordable, simple, better, comprehensible, related to tutorials, better, advantageous, clear, precise, easy, allowing to learn and rectify mistakes, developed, explicit, thought-provoking, containing hidden answers and necessary, favorable and explanatory data, recalling notions about the Archimedean thrust, resembling a Game.*

As for the 35.97% of learners who prefer the WITHOUT subject, they are all in the control group and justify their choice by saying mainly that: the *WITH subject is too long, this subject is too simple, it becomes too easy to deal with.*

It should be remembered that assessment must be carried out at the beginning, during and at the end of their teaching and learning sequences in order to provide their learners with the benefits of assessment. However, when the size of the class, the delay in the progress of the dense program and the small amount of time granted will no longer allow or promote its practice, the teacher can turn to the tutorial training topic and the summative assessment topic to continue teaching his learners while saving time. The aim here is to make summative assessment formative, by making use of enhanced assessment items. That is, by inserting with great tact and caution in the context of the assessment items additional information related to the course or to daily life to allow learners to better assimilate the course and better understand the assessment topic. The purpose of these items will be to allow the continuity of the teaching and learning process and to allow learners to build their own knowledge as the subject is treated in order to learn in depth.

Conclusion

In conclusion, it emerges from this study that it is really possible to ensure the continuity of the teaching of a large number of concepts in the Physical Sciences through the use of improved assessment items. Because, in the training and evaluation topics developed to illustrate this innovation, it was possible to insert 39 additional pieces of information in the tutorials and in the WITH subject. Based on the results of the statistical tests, it is possible to confirm that learners can make meaningful learning in the Physical Sciences through the use of the enhanced assessment items. Having seen a rate of success of 12.41% in the control group and 100% for the experimental group. Based on the results of surveys conducted among learners and teachers, it is established that teachers and learners perceive positively the use of the improved assessment items, as all of these teachers consulted approve of the proposal to make up for the information not or poorly taught by teachers due to lack of time using the improved items, while 64.03% %of learners report that they prefer the WITH Topic compared to 35.97 %of the control group who prefer the WITHOUT.

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