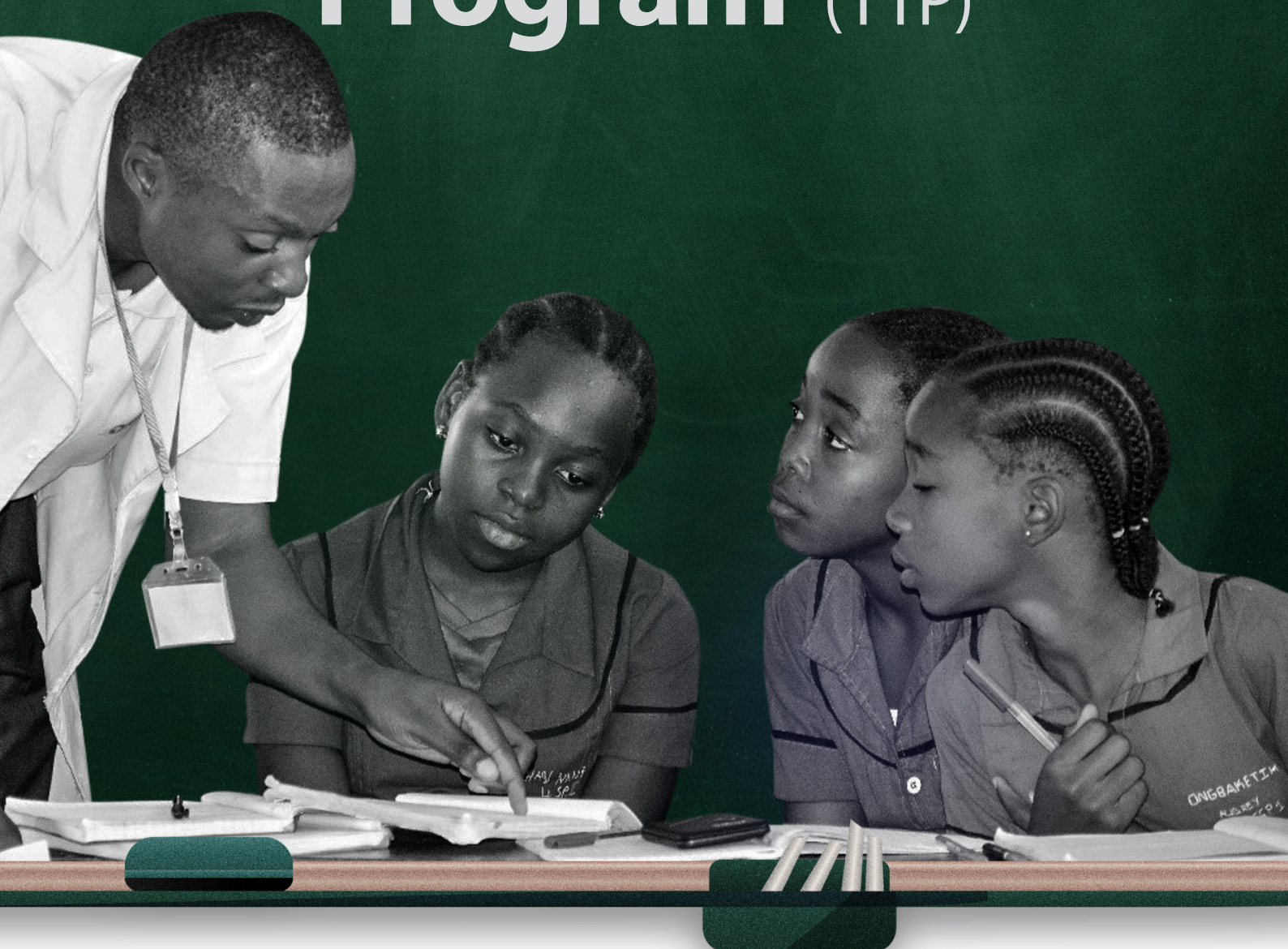




# Teacher Training Program (TTP)



## Goal and Pillars

### Goal

Increased number of girls and boys pursuing math and sciences at post-Secondary Level

### TTP Rwanda Pillars

1

Training of teachers and master trainers, 30% pre-service, 70% inservice training.

2

Learning materials resources and ICT support

3

Outreach and public engagement

4

Evidence generation for policy dialogue



# COMPREHENSIVE ASSESSMENT

Assessment bridge of teaching and learning



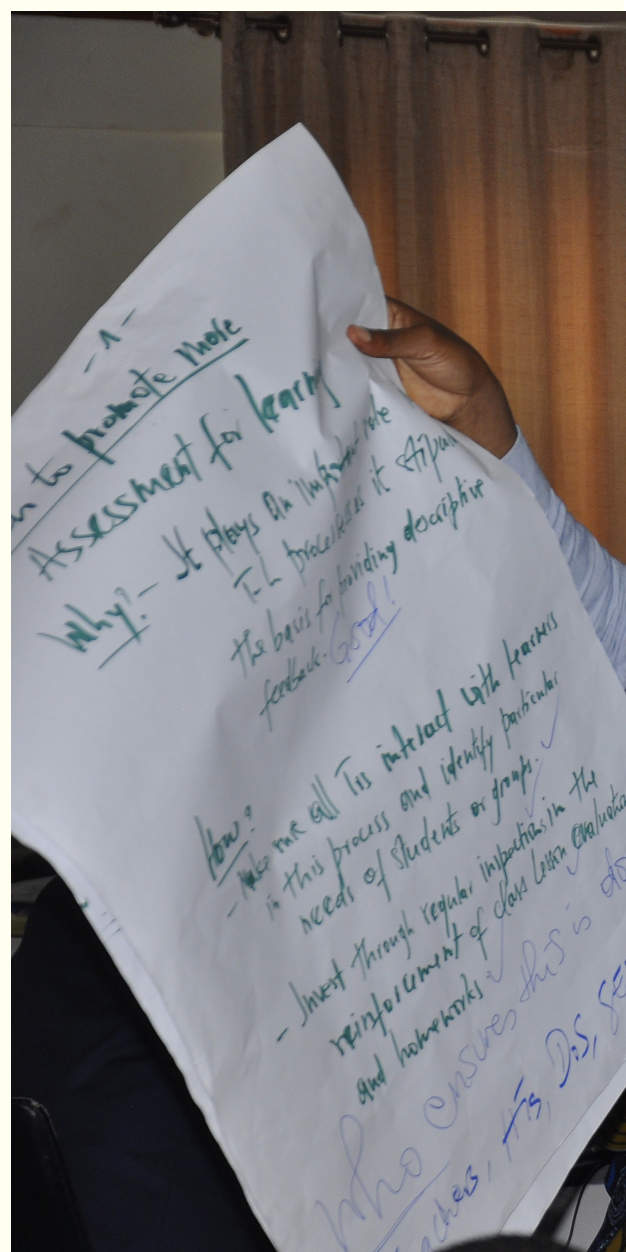
# About AIMS

Founded in 2003, the African Institute for Mathematical Sciences (AIMS) is a pan-African network of centres of excellence for post-graduate training in mathematical sciences, research and public engagement in STEM. With centres in South Africa, Senegal, Ghana, Cameroon and Rwanda, AIMS is leading Africa's socio-economic transformation through innovative scientific training, cutting-edge research, and public engagement. With expertly tailored academic and non-academic programs spanning through Centres of Excellence, Research Centres, the AIMS Industry Initiative and gender-responsive Teacher Training, AIMS equally created two critical initiatives: Quantum Leap Africa, which aspires to do leading-edge research in quantum science, and the Next Einstein Forum, which is positioning Africa to become an important player in global science. For more information, visit [www.nexteinstein.org](http://www.nexteinstein.org).

## About Teacher Training Program (TTP) Rwanda

The AIMS Teacher Training Program (TTP) implemented in Cameroon and Rwanda was developed to improve learning outcomes in mathematics and STEM for secondary school students. Through professional development courses, high-quality classroom resources and technology-driven Smart Classrooms, TTP is empowering teachers to improve their pedagogy and increase the transition to tertiary STEM education. Teachers are trained to be aware of and counter stereotypes that push girls out of mathematics and science.

Since inception, over 1000 teachers in Rwanda have benefited from technology-enabled teacher training, gender-responsive modules, online English proficiency training and social media engagement. Three hundred of the teachers have since completed an internationally accredited course on effective ICT pedagogical skills by ICDL Africa and over 800 have Twitter accounts and are active participants in conversations on education.





# LEVEL OF EFFICIENCY IMPLEMENTING THE COMPREHENSIVE ASSESSMENT POLICY



In order to improve the quality of education, starting from 2019, the Ministry of education has initiated key strategies to improve the quality of teaching and learning to advance Rwanda's agenda to become a knowledge-based economy. One of these is to ensure that effective learning has taken place and due competencies have been acquired. This strategy has resulted in the establishment of a system of comprehensive assessment in primary, secondary, TTC, and TVET schools.

**The comprehensive assessment includes three levels of assessments:**

## **Classroom level assessment**

(prepared at school level)

## **End-of-Term assessment**

(Prepared at district level)

## **End of year assessment**

(Prepared at National level)





## Education/Sector Education Leaders and comprehensive assessment policy.

The introduction of the common district and national assessment each year for each classroom as core pillars of the MINEDU Comprehensive Assessment Policy (2019), amplified the expectation for sector and district education leaders to play a more pivotal role in providing 'leadership' and shaping of quality assurance mechanisms for the overall running of assessment in the schools.

That said, the submission by the district and sector education leaders right from the beginning of the workshop suggested gaps in the leaders' levels of proficiency and confidence in playing this enhanced role in assessment: Asked about their expectations about the workshops, across the different sessions the following were presented across the different groups as common expectations:

- To understand different type of assessment (assessment for learning, assessment as learning, and assessment as learning)
- To be 'empowered' to be able to prepare and conduct assessments in Maths and Sciences
- How to analyse and interpret students' results quantitatively/qualitatively and how to give feedback to students?
- To understand different tools used in data analysis (pivot in excel for example)
- To understand the quality of a good examination paper.
- Different methods of setting questions of evaluation/test
- Different strategies to promote in school's assessment for learning and assessment as learning



# FEEDBACK ON IMPLEMENTATION OF THE DISTRICT ASSESSMENTS IN 2019

Notwithstanding the above-mentioned areas for enhanced professional development/understanding, the Sector and district education leaders were fairly 'happy' with how well the first edition of the 2019 district and national examinations were carried out in their districts.

As captured by the sample points below presented by the district education leaders, there seemed to be levels of satisfaction and appreciation of the value of running district examination in standardized testing across the schools thus allowing for comparison of teachers and students across the schools. Some of the areas identified as key area satisfaction highlighted by the leaders included:

## What worked well in the district examination

- Most of the district and sector education officials appreciated that the exam was in line with the competence-based curriculum.
- The district had a **common timetable** which is helped in **quality assurance**
- These exams helped to know **how different teachers** go around in the program: the quality of teaching and the engagement with assessment such as in marking.
- The district exam helped teachers **in self-evaluation compared** to other schools in the same districts.
- Education officials in districts and sectors appreciated the facts that all students in the same class sat for the same exam allowing then to self-evaluate and compare themselves with others in the same district from different schools
- There were **results analysis and ranking of schools** and students in the districts. This was a helpful asset toward helping teachers and school leaders to monitor the progress in teaching and learning.

# WHAT DID NOT WORK WELL IN DISTRICT EXAMINATION

While applauding the above identified strengths, the district/sector education leaders pointed out a number of areas in the implementation of the district examination that they considered not to have gone so well:

## Equity

The standardised tests may not have taken into consideration the varying or diverse levels of engagement with the curriculum which may have been orchestrated by factors such as ‘missing’ teachers or different schemes of work across schools within the districts.

## Reflection

Given the strong ‘comparison’ attribute that seemed to be linked to the district/national assessment, there were concerns that the result of this was unfair ‘judgment of both teachers and students. For the students, this could result in a lower sense of confidence towards learning overall and a negative attitude towards specific subjects.

This may eventually negatively impact the efforts made towards reducing dropout rates, especially for the girls.

## Exam preparation

### Resource allocation

In some districts, education officials have indicated that exams were prepared very late and there was no budget allocated for it.

Due to lack of resources, some schools were forced to write examinations on the board (thereby presenting a number of challenges including equity in engagement; time allocation, team composition, skills, and preparation





Many of the districts reported having examination preparation teams that were mostly drawn from the school's of excellence or top schools in the districts:

## Reflection

The challenges that it might present was a key debate in the meeting. After much debate and considerations, there was an agreement that effort must be made to have all three types of schools presented. These would allow an expanded lens in formulation and presentation of questions, for example, taking into considerations different levels of English proficiency which may then require for the papers to be made more visual.

Teachers invited in the preparation of the district exam did not have enough skills to set an exam of good quality due to lack of training and limited time.

## Quality Assurance

- Some of the examination papers had too many questions this was especially so for lower primary schools.
- The time allocation for some of the questions was considered too long by some of the students\*
- Some topics considered to be taught in term 3 were assessed: may have been as a result of the difference in schemes of work?
- In some instances, the mark allocated for questions were too high or too low
- typo or conceptual errors were identified and this caused confusion for some students

## levels of difficulty:

The feedback from the district education leaders/ AIMS Champion teachers and actual blueprinting of some of mathematics and science papers indicated that a majority of the districts set questions that fell in bloom taxonomy levels 1 and 2 (see bloom taxonomy table below)

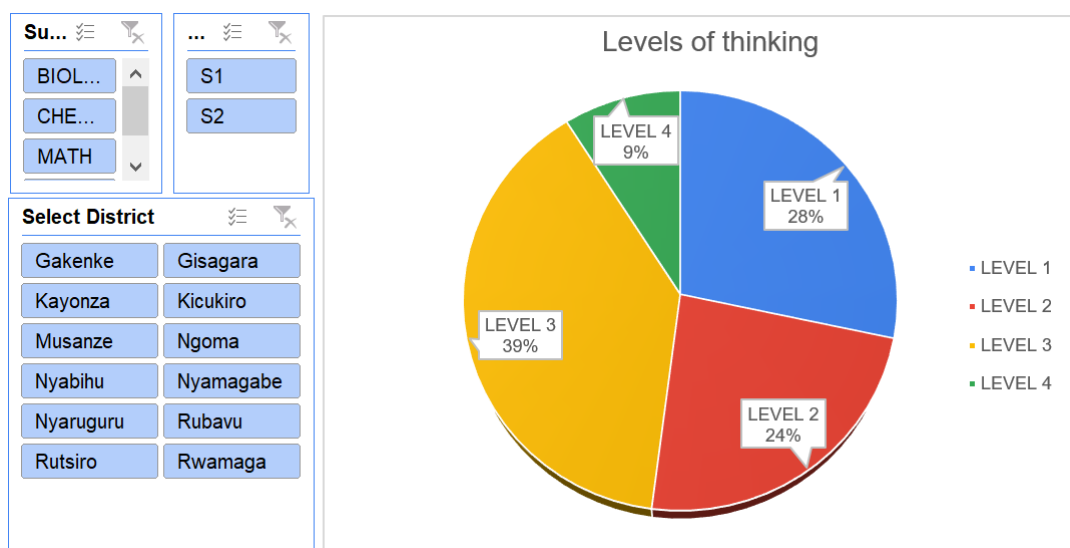
Levels of Thinking		
'Depth of Knowledge' Levels Webb (2009)*	SOLO Levels Biggs & Collis (1982)*	Taxonomy Levels Bloom (1956)
<b>1 Recall and Reproduction</b> Recall of a fact, information or procedure	Define, identify, name, draw, find, label, match	Knowledge
<b>2 Development of Skills and Concepts</b> Development of conceptual understanding and use of information	Describe, list, outline, complete, continue, combine	Comprehension
<b>3 Application and Reasoning</b> Applying knowledge, understanding and skills in a range of situations, reasoning and developing a plan based on understanding	Sequence, classify, compare and contrast, explain (cause and effect), analyse, form an analogy, organize, distinguish, question, relate, apply	Application and Analysis
<b>4 Extended Thinking</b> Further investigate, collection of data and analysis of results to refine understanding	Generalise, predict, evaluate, reflect, hypothesize, theorise, create, prove, justify, compose, prioritise, design, construct, perform.	Synthesis and Evaluation

## Reflection

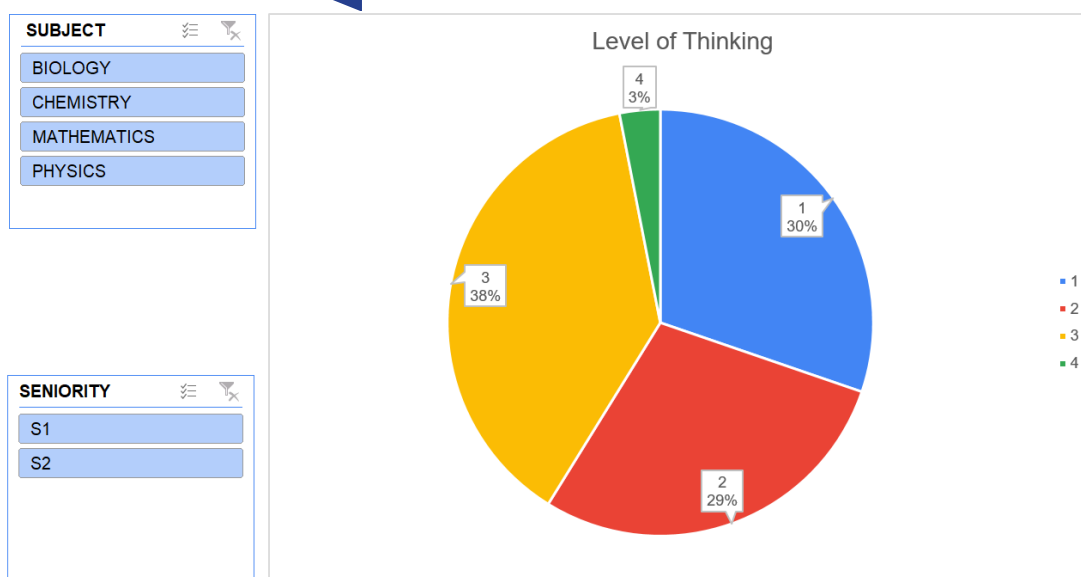
As such, the examination papers failed to examine the core competencies such as critical and analytical thinking.

Examples of how the questions were distributed in district examinations are presented in the pie-charts below:

### District examinations:



### REB examinations:



The concept of how questions should also be ordered in the paper according to difficulty also came up: a number of districts including REB papers had some of the mathematics /science papers starting with quite difficult questions. As captured in the excerpt below, concerns about this were not just captured by teachers/district education leaders but also AIMS international resource persons:





## Exam confidentiality

- The confidentiality of the exam was questionable as the means for distribution of the exam from districts to the school was poor. Some for the distribution path was WhatsApp, email, flash disk, etc.
- In addition to failure in fair distribution, there were issues in the multiplication of the exam at the school level. Some had printers and others not hence opting to use outside printing services also reducing the level of confidentiality of the exam.

## Marking process

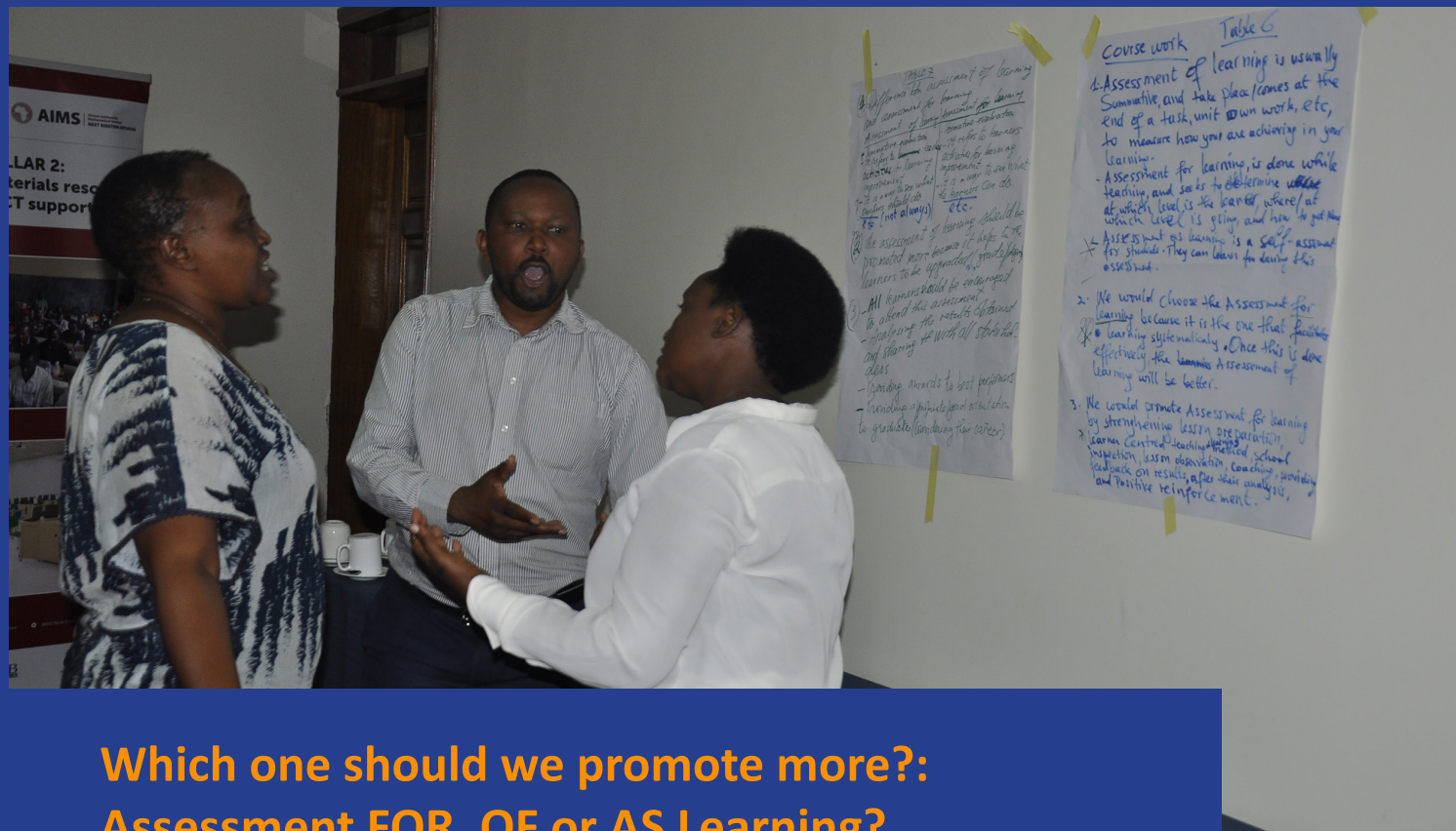
- Some exams did not have their marking scheme ready at the time of marking. This resulted in some delays in marking but also questionable validity of the overall outcomes of the exams from the individual schools.
- Top-down policy direction for inter-school marking proved problematic given the varying number of students and teachers across schools in the same districts.
- Additional questions on the validity of the exams were raised due to the following factors:
  - The implied personal consequences on the teachers from the examination results may have led to inaccurate marking
  - Number of examination scripts against provided time
  - The low motivation for marking scripts from students from other schools.

## Feedback process:

For many districts there was no clear mechanism for sharing the feedback examination was not shared among stakeholders.

## Reflection

How might policies such as inter-school marking hinder the process and nature of feedback from examinations?



## Which one should we promote more?: Assessment FOR, OF or AS Learning?

Underlying the prevailing practices during core components of assessment such as preparation; composition of examination team; quality and content of questions; marking; and feedback process is the considered purpose of the assessment.

What became apparent from the two-day discussions is that the prevailing culture in our schools and mindset of the key stakeholders such as district/sector education leaders, towards assessment is that of Assessment OF Learning.

The orientation towards Assessment OF learning instead of assessment AS learning could be deduced from key submissions from the district education leaders including:

### Definition of the comprehensive assessment policy

Asked to define the comprehensive assessment policy a number of the participants highlighted aspects such as measurement of or implementation of the curriculum; learning; teaching and quality of examinations

### Purpose of the assessment

Similarly, when asked what their opinion was as to why the comprehensive policy was created, a significant number of the district/sector leaders highlighted: measurement of performance; standardisation of examinations; and monitoring of outcomes for high stakes decisions such as job assignments.

There was a sense of silence from the participant in picking out the role of the district assessment in improving daily teaching and learning in the schools.

Indeed as captured in the early section of these reports most of the sector education leaders highlighted comparison within and across schools as one of the key purposes of the district assessments.



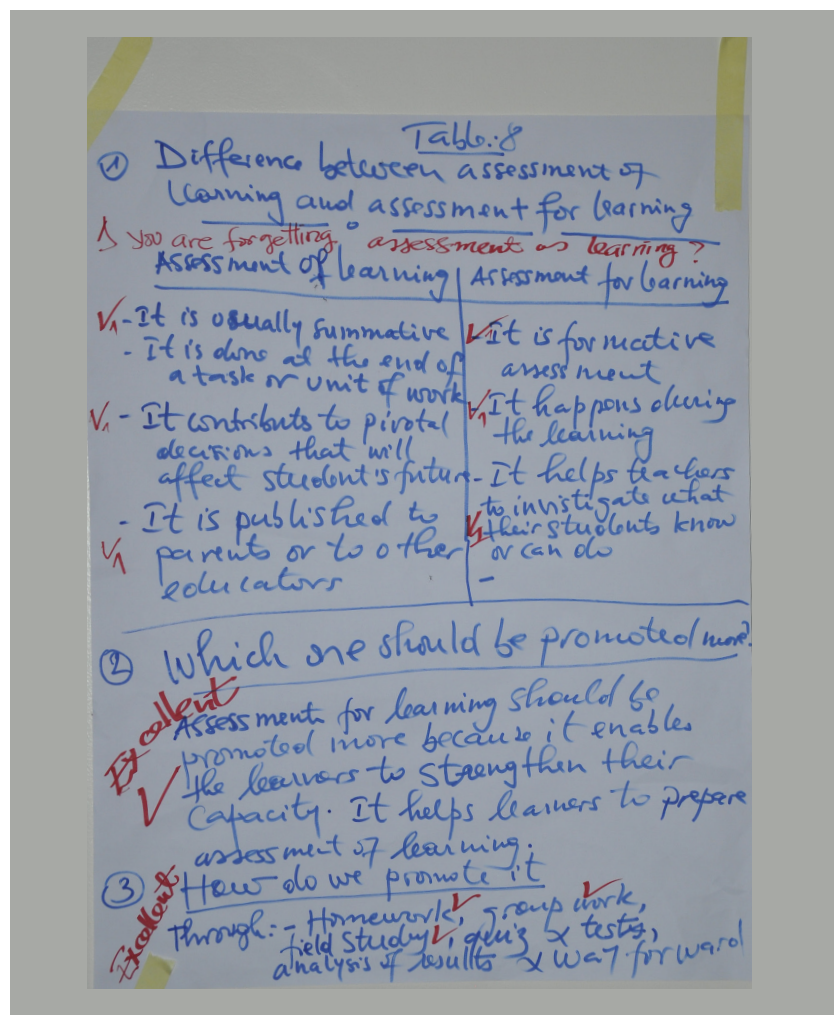


Figure 1 Purposes of Assessment for Different Audiences displayed in word clouds

## Nature of feedback given to peer activities

In the instances that the sector/district education officers were asked to give responses to their peers during the two-day workshop, the general tendency was marking out the work in form of right or wrong and making statements such as excellent or poor as overall feedback. On a very few occasions did the individual or collective opt for giving feedback on specific areas with an explanation of why it was not accurate or what needed to be improved.

There was however an observation that for a number of the sector/district education leaders: there was a form of confusion in differentiating practices that would support assessment for and assessment of learning. Many of the district education leaders associated- assessment of learning with a period of administering examination: exams given within the classroom or during the term were automatically considered to be an assessment of learning even when the nature of feedback by the teacher tended to be summative in the form of marks or right -wrong indication.





- The emphasis that assessment for learning was considered to have a core purpose of improving the quality of teaching was also lost on many of the leaders; for them, the students were always the one being assessed and even when the teachers were considered it was not about the specific areas for improvement but the judgment of how bad or good a teacher was.
- Finally, the concept of how students could use assessment AS a learning mechanism, where students stopped to consider deeply their ‘mistakes’ to identify and work on the implied gaps in specific areas of learning was also very minimally understood by the sector /district education leaders.
- As captured by the template below, the nature of feedback collected by the districts and by extension REB at the end of the district examination papers was mostly summative instead of formative.

## ORDINARY LEVEL PER GRADE

Classes	Total number of learners			Subject	Range of scores per subject	Number of students	Percentage%
	Boys	Girls	Total				

template for reporting about district exams.





# RECOMMENDATION FOR DISTRICT EXAM

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- A district should have the same scheme of work to allow all teachers to go around the program in the same way and reduce the number of students that will be asked to answer questions from the topic they have not yet covered.
- The team to prepare district exam should feature teachers from all kinds of school in the district (school of excellence and boarding school, 12 years' basic education school, and 9 years' basic education school) at a good proportion to allow a diversity of ideas in the preparation of exam
- Districts in partnership with key partners such as AIMS needed to work together in training and enhancing the capacity of teachers to set quality examinations
- All districts should have a different team to validate the exam and marking scheme to minimise the errors that appear and to ensure the quality of exams.
- The district should allocate a budget to this exercise to facilitate the preparation process, printing, and communication.
- Employment of strategies such as focusing on formative feedback topics/questions that were problematic to students in specific subject examinations instead of just total marks and averages when coming up with district or sector improvement academic improvement plan
- deploying peer learning mechanisms to promote assessment AS learning: delaying providing the right answer and instead of pushing students to individually or collectively reflect on why a specific answer was wrong or right.
- To mitigate the impact of the language barrier in examinations papers examiners should make more effort to ensure that the exams are more visually balanced. Using more figures and diagrams in an examination other than just text.
- Further, short clear, and precise sentences should be used in word problems in mathematics/physics/biology.
- MINEDUC/MINALOC/REB should accelerate the process of providing teachers to the school to reduce the gap in program coverage for many students in different schools.



**Giving impetus to the shapers  
of Africa's future leaders**



## 1000+... number of teacher trained through AIMS TTP Technology Enabled Teacher Training

**472** teachers trained and internationally certified by ICDL.

**1000+** teachers trained on a number of gender-responsive pedagogical modules including a series on Teaching in Africa in times of Corona.

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**800+** teachers mobilized to register twitter and Facebook accounts during the period. As result, the teachers are now active participants in public discourse in education and have also been able to take advantage of opportunities to participate in international webinars and training on education and actively

**300+** mathematics and science teachers participated in the first AIMS TTP audio lesson challenge.

**500+** mathematics and science teachers mobilized to register for ONLINE English Proficiency Training

**500+** teachers reviewed online resources and sat for online (pre & post) tests to enhance mastery of specific mathematics and science topics identified by them at the beginning of the intervention as 'difficult' to teach.

“

AIMS has been of great importance to me as a person and as a teacher. I improved my teaching style through different pieces of training such as English proficiency, computer, and mastery of content. These online trainings helped me acquire leadership skills, collaboration, teamwork spirit, resilience, patience, and hard work. I'm a different person and different teacher ready to bring change in my work thanks to the Teacher Training Program.



**Twishime Angelique**

Teacher of Biology & Sector Coordinator of AIMS  
**Kayonza District**

“

I wholeheartedly appreciate AIMS training as they helped me during the Covid-19 period up to now. I acquired more skills, collaborated with others, stayed in the teaching mood while sharpening my way of teaching.  
Much thanks



**Nkurunziza Isaac Xavier**

E.S Rwamashyongoshyo  
**Rwamagana district**



“

As far as I know a challenge turns into the greatest motivation and opportunity. That roots from my Mawe Karambe spirit. There is a lot to tell but in one, AIMS TTP helped me discover a new version of me and a new insight of my professional career as a teacher.



**Ntezimana Vital**

**Gicumbi District**



“

AIMS TTP helped me to improve my critical thinking, problem-solving, pro-activeness as well as efficiency. All these were attained through learning from others. As a professional teacher, AIMS TTP helped me to improve the use of ICT in teaching as well as learning mastery of the contents.

**Valens Uwimana**

**Gicumbi District**

“

AIMS TTP increased my ability to do research through ICT knowledge which had a positive impact on my teaching career. Many thanks to AIMS TTP!



**Habamungu Emmanuel Pacifique**

**Gicumbi District**

“

AIMS TTP has impacted me on having a good idea on gender-responsive pedagogy for improving the performance of girls and boys in my subject. Also, to ensure that my students of O' level learn well and love Math& Science so that, they can go to study Science combinations after National Exams. In addition to that, I gained additional knowledge, values, skills, and attitudes as to be an amazing science teacher. Last but not least, AIMS TTP helped me discover a better methodology for teaching my students in this hardest time of Corona



**Habumuremyi Jean Damascene**

**Musanze District**



“

Learning never stops since Life itself is a teacher AIMS TTP helped me to take the next step toward my dream of becoming a good educator



**Uwase Liliane**

**Musanze District**

“

Active listening, role model and teamwork with my fellow Maths & Sciences teacher are values that I gained from AIMS TTP that allow me to motivate students both girls and boys to love and perform well in Maths and Sciences. Integration of ICT in teaching Maths & sciences that I have received training by AIMS-TTP allow me to deliver chemistry lesson effectively using simulations and online laboratories.



**Munyeragwe Pierre Claver**

**Musanze District**

“

It was really hard for me to adapt to the online training, however, I decided not to give up. My resilience allowed me to learn a lot about how I can leverage social media platforms like Twitter and Facebook to share ideas with fellow teachers. I also learned how to tap into ICT in teaching and assessing students especially in this Covid-19 pandemic. All my efforts were finally compensated by an ICDL certificate. I really appreciate the work of AIMS TTP. Thank you very much.



**Nirere Nadine Laurence**

**Kamonyi District**

“

AIMS TTP plays a great role in my daily duties related to education. AIMS TTP training increased my thinking and improved teaching and learning capacity in math and science subjects. I am also devoted to raising the number of both girls and boys who love math and science.



**Vincent Hatangishaka**

**Kamonyi District**



“

During the Covid 19 lockdown, my husband was far away from me; In that loneliness AIMS helped me to stay connected within the teachers' community. In online pieces of training, we were assisted to share experiences with fellow teachers of mathematics and science. I also increased my English proficiency and I got so much interest in using ICT tools in teaching activities.



**Mutuyemariya Prisca**

**Nyanza District**

“

AIMS TTP has impacted me as a person and my teaching in knowing how I can assist all learners to learn even though they have different abilities and how I can evaluate them. I have also increased my knowledge of mastering content. Before some topics were difficult for me, but now, I deliver on them without any problem.



**Nkeshimana Gilbert**

**Nyaruguru District**

“

As a person AIMS help me to collaborate with others, they helped me to improve on the integration of ICT in the teaching and learning process.



**Ayingeneye Angelique**

**Karongi District**

“

Alone I can't achieve easily to my goals while together we can reach far, AIMS TTP helped me share knowledge with fellow teachers, hence increase my know-how. I would love to sensitize teachers to motivate learners and they will motivate them back with their success.



**Uzabaho Seraphine**

**Ngororero District**



“

AIMS has empowered my level of critical thinking and the use of relevant online resources in teaching and learning Mathematics and Sciences.



**Twahirwa Theoneste**

**Ngororero District**

“

AIMS TTP helped me to improve my ICT knowledge. This made easy my preparations for lessons. I was also helped to revise my subjects by doing the tests related to it. Now, I master well my subject and I am able to teach well than before.



**Dushimirimana Arlette**

**Nyabihu District**



“

I am thankful to AIMS TTP for empowering me with skills that will enable me to take to the next level by teaching and learning mathematics and sciences. I am so glad to be one of AIMS TTP teachers as I am going to take part in increasing the number of girls and boys pursue Math and Sciences in secondary schools and even at university. Proudly to be an agent of changes.

**Kantengwa Claudine**

**Nyamasheke District**

“

Personally, AIMS TTP helped me to feel free in expressing my thoughts and to learn from other teachers. In my teaching activities, AIMS TTP helped me to encourage all students (girls and boys) to love mathematics and Sciences.



**Niyitegeka Nelson**

**Nyamasheke district**





“

Throughout AIMS TTP, I gained skills on how to increase communication and collaboration with other teachers as well as how to increase gender equality especially in the sciences teaching and learning process. Many thanks to AIMS.

**Bunani Elizaphane**

**Rubavu District**



“

Every day AIMS TTP reminds me of my responsibilities as a good teacher (spirit of loving the learners). They also helped me to improve the relationship between me as a teacher with my learners and improve my ICT skills.

**Mukadusabe Ernestine**

**Rusizi District**



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