

SEPTEMBER 2024

Improving Teaching Practices in a Foundational Literacy and Numeracy Program in Senegal

Summary

Accustomed to one mode of classroom instruction, teachers are often asked to adopt new, evidence-based practices to improve students' learning. We explored ways to help teachers provide better support to multiple groups of students, grouped by proficiency levels in reading and math. We tested three designs and found that low-cost solutions like training incorporating role playing, simple checklists, and reminders could help teachers be more effective. Ultimately, this work shows how behavioral science can enhance foundational literacy and numeracy programs and help more kids achieve the skills they need to thrive.

The challenge

Foundational literacy and numeracy (FLN) in Sub-Saharan Africa remains low, and Senegal is no exception. In 2019, 69% of children in Senegal could not read a simple text with comprehension by the age of 10. Only 62% of students in fifth grade in Senegal have the required skills in math to continue their schooling without difficulties.

To help address this challenge, Associates in Research and Education for Development (ARED) launched *Ndaw Wune*, an after-school remediation program aimed at improving FLN outcomes among second and third graders in Senegal. But while this program holds enormous promise to help students, it represents a different kind of pedagogy that teachers need to learn, and students aren't always learning as much as they could be. The field of behavioral science—the study of how people make decisions and act in the real world—offers the opportunity to better understand what might be preventing teachers from adopting new pedagogical practices and to introduce effective, low-cost ways to help instructors maximize their teaching.

How it works

Ndaw Wune classes are taught by public school teachers, referred to as “tutors,” and occur after school three times a week for two hours. Roughly half of each class focuses on reading in the local language and the other half focuses on math.

The Ndaw Wune program trains tutors in a new methodology known as *differentiated pedagogy in leveled smaller groups*. This methodology requires tutors to adopt new teaching practices, such as grouping students by their proficiency levels in reading and math (rather than by age), and simultaneously managing multiple groups of students in the same classroom. Each class has one *relearning group* and one or two *autonomous groups*.¹ The students designated as the day's relearning group change each class. Tutors follow a guide that provides daily lesson plans for the day's relearning group, whereas the autonomous groups work independently using their student workbooks. Tutors are expected to rotate between the relearning and autonomous groups, providing support to all students throughout class.

¹ Generally, in reading there are two autonomous groups and in math there is one autonomous group.

In partnership with ARED, ideas42 explored ways to improve the Ndaw Wune program by applying a behavioral science lens. Through 30 in-depth interviews with Ndaw Wune tutors and their supervisors, as well as 10 classroom observations of Ndaw Wune classes, ideas42 found that **tutors were not providing adequate support to all groups of students**. Instead, tutors primarily focused on the relearning group, spending insufficient time with and offering limited support to the autonomous groups. Students in the program generally spend at least half of their time in autonomous groups, equating to at least three out of six hours of instruction each week. Receiving insufficient support from tutors while in autonomous groups resulted in many of these students being off-task, or not engaged in learning, for a significant portion of class time. This hindered students' ability to benefit fully from the program and improve their FLN skills.

Helping teachers more intentionally allocate their time and provide better support could in turn help students make important gains in their literacy and numeracy. We set out to design ways to make that happen.


Behavioral insights and solutions

The interviews and classroom observations highlighted four behavioral barriers that hindered tutors from providing enough support to the autonomous groups:

1. Tutors prioritize the upskilling of the relearning group to such an extent that the needs of the autonomous groups are overlooked.
2. Tutors are content if autonomous groups are quiet, even if they are not on-task.
3. Tutors lack clear guidelines and reminders for how much and when to provide support to autonomous groups.
4. Tutors face hassles, such as the organization and setup of their classroom, that impede their ability to provide support to autonomous groups.

Based on these insights, we designed a suite of solutions to address the behavioral barriers and support tutors in providing more and better quality support to autonomous groups:

- ▶ **Additional training module and commitment contract:** A classroom management module integrated into the existing training tutors receive, which utilizes role modeling and role playing to demonstrate how to organize the classroom, set up autonomous groups up for success, rotate among groups, and ensure students in autonomous groups are learning and engaged. This is accompanied by a commitment exercise that helps tutors commit to supporting all groups of students and form strategies for how to achieve this goal.



Ndaw Wune: Success for All.

My commitment to help all Ndaw Wune students learn and succeed:

My name is _____

I am a tutor for the Ndaw Wune program at _____ school.

What steps will you take to meet your commitment as a Ndaw Wune tutor?

<p>It is important to set all students up for success.</p>	<p>I will set the autonomous groups up for success by....</p> <p>_____</p> <p>_____</p> <p>I will set the relearning group up for success by....</p> <p>_____</p> <p>_____</p>
<p>Students need support to stay motivated, on-task and learn.</p>	<p>I will motivate and keep students in autonomous groups on task by....</p> <p>_____</p> <p>_____</p> <p>I will motivate and keep students in relearning group on task by....</p> <p>_____</p> <p>_____</p>
<p>As a Ndaw Wune tutor, it is important to reflect on whether you are meeting your goals and solicit help if you need it.</p>	<p>If I am struggling with managing the autonomous and/or relearning groups, I will...</p> <p>_____</p> <p>_____</p>

Date _____
Signature _____

► **Heuristics checklist and reminders:** A short checklist outlining how tutors should set up their classroom, as well as what tutors should do before, at the start of, and during class, including how to allocate their time between the different groups and what they should do when they are with each of them. This is integrated into the existing tutor guide and is accompanied by visual reminders in the guide’s lesson plans to rotate to the autonomous groups.

► **Ndaw Wune Promise:** A simple, catchy chant recited at the beginning of class to help tutors and students set goals for how they will behave in class and what they will accomplish.

How to prepare for and run your Ndaw Wune classes


BEFORE CLASS:

1	2
ARRANGE DESKS <i>(see instructions on pg. 3)</i>	WRITE ON BOARD <i>(see relevant lesson plans for content to write)*</i> <small>*Remember to write on the board which page numbers students in the autonomous groups should complete in their student booklet</small>

AT THE START OF THE READING LESSON:

3	4
SAY THE NDAW WUNE PROMISE <i>(see words on pg. 4)</i>	PROVIDE INSTRUCTIONS TO AUTONOMOUS GROUPS <ul style="list-style-type: none"> Give students any additional materials needed to complete exercises Ask students to open their student booklets to the correct page Explain instructions Ask if anyone has questions Check for understanding

DURING LESSONS:

5	6
GO TO THE RELEARNING GROUP AND FOLLOW THE LESSON PLAN <ul style="list-style-type: none"> Follow the lesson plan in your tutor guide for the day 	ROTATE TO AUTONOMOUS GROUPS WHEN YOU SEE THIS ICON IN THE LESSON PLAN  <p><small>It's ideal to rotate when the relearning group is:</small></p> <ul style="list-style-type: none"> Completing "You do" activities Writing on slates Working in pairs

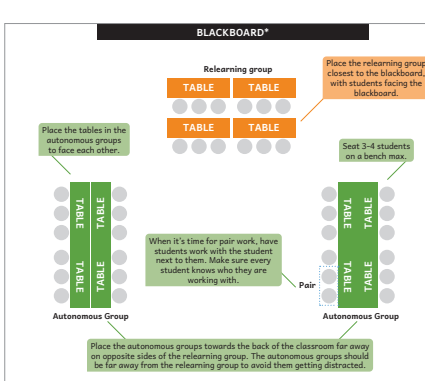
Autonomous group management best practices

As a tutor, it is your job to keep students in autonomous groups motivated, on-task and learning!
HERE ARE SOME TIPS TO HELP YOU DO THIS.

<p>WHEN TO ROTATE</p> <p>Rotation happens when the re-learning group has an activity to complete on their own or with pairs, such as:</p> <ul style="list-style-type: none"> "You do" activities Writing on slates Working in pairs <p><small>Tip: 🧑 icon in the lesson plan represents rotation.</small></p> <p><small>Tip: No group should be left alone for more than 15 minutes.</small></p>	<p>FREQUENCY OF ROTATION</p> <p>You should rotate to each autonomous group between 2-3 times, in reading and in math.</p> <p>DURATION OF ROTATION</p> <p>You should spend 3-5 minutes with the autonomous group each time you rotate.</p>
<p>WHAT TO DO WHEN YOU ROTATE TO AUTONOMOUS GROUPS</p> <ul style="list-style-type: none"> Ask if anyone has questions. Check 2-3 students' work and correct if necessary. 	<p>PROVIDE POSITIVE REINFORCEMENT FOR STUDENTS' GOOD WORK.</p> <ul style="list-style-type: none"> Explain instructions for the next exercises. Suggest additional exercises if students run out of work.
<p>STUDENTS IN AUTONOMOUS GROUPS ARE LIKELY OFF-TASK IF THEY ARE...</p> <ul style="list-style-type: none"> Distractioning others. Listening to what the relearning group is doing. Staring at the board or into space. Being quiet but not doing the exercises in their book. <p><small>Tip: If you notice students in autonomous groups doing any of these things, rotate to them & follow instructions for what to do with autonomous groups above.</small></p>	

The Ideal Classroom Setup

Try to set up the desks like this before class starts



BLACKBOARD*

Relearning group
TABLE TABLE
TABLE TABLE

Place the relearning group closest to the blackboard, with students facing the blackboard.

Place the tables in the autonomous groups to face each other.

Seat 3-4 students on a bench max.

When it's time for pair work, have students work with the student next to them. Make sure every student knows who they are working with.

Autonomous Group

Pair

Autonomous Group

Place the autonomous groups towards the back of the classroom far away on opposite sides of the relearning group. The autonomous groups should be far away from the relearning group to avoid them getting distracted.

*If there is an extra blackboard, you can use it for the autonomous groups









WHAT IF YOU CAN'T MOVE THE DESKS?

Make sure the relearning group is closest to the blackboard.

Space autonomous groups as far as possible from the relearning group to avoid them being distracted.

Ndaw Wune Promise

Tutors and students should **STAND AND SAY THE NDAW WUNE PROMISE** at the beginning of class

 Tutor: What will we do today? <small>[movement: hands outstretched]</small>	 All: We will learn, learn, learn! <small>[movement: clap, clap, clap]</small>
 Tutor: What will you do today? <small>[movement: pointing to students]</small>	 Students: I will do my work and raise my hand if I have a question! <small>[movement: raise hand]</small>
 Students: What will you do today? <small>[movement: pointing to tutor]</small>	 Tutor: I will explain instructions, answer questions, and check your work to help every group learn! <small>[movement: raise arms up in the air]</small>
 Tutor: What will we do today? <small>[movement: hands outstretched]</small>	 All: We will learn, learn, learn! <small>[movement: clap, clap, clap]</small>

Results

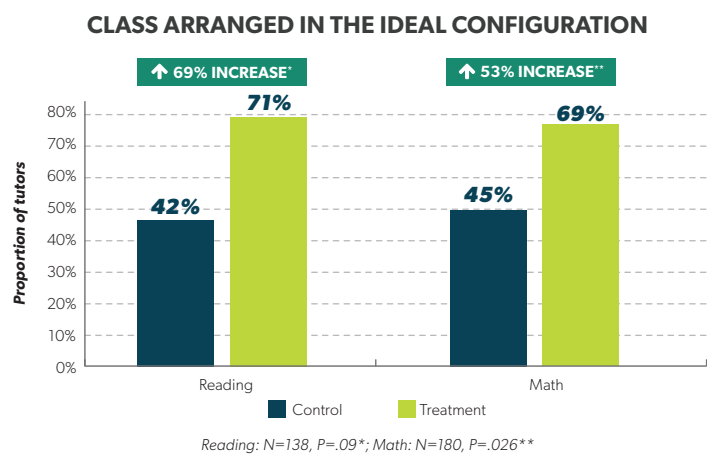
We evaluated our package of behaviorally designed solutions through a randomized controlled trial (RCT) involving all 200 Ndaw Wune tutors. We conducted the RCT from January to May 2024. Tutors were divided into two groups: a treatment group that received the package of behaviorally designed solutions, and a control group that received the original Ndaw Wune training and materials. We randomized tutors into the treatment or control group at the supervisor² level, meaning that all tutors reporting to the same supervisor were placed in the same group.

We implemented our interventions in January 2024 using a training of trainers model, following the manner in which ARED conducts training for the Ndaw Wune program. Specifically, supervisors who oversaw tutors assigned to the treatment group received the additional training module together with the full suite of interventions. They then delivered the package of interventions to their respective tutors through four regional trainings.

Evidence from the RCT indicates that the behaviorally designed solutions led to positive changes on tutors' support of the autonomous groups.

Tutors arranged their classrooms more effectively

The heuristics checklist in the updated tutor guide included a visual of the ideal classroom setup (see page 3) to demonstrate how tutors should set up the desks in their classrooms. Tutors in the treatment group were 69% and 53% more likely to organize their classrooms in the ideal configuration for reading and math, respectively, than those in the control group. These changes were statistically significant.



“ Now I know this [relearning] group has to face the blackboard. So, I think there’s an organization here that allows the teacher to circulate and also really manage the relearning group and also the autonomous groups.”

—Tutor in the treatment group

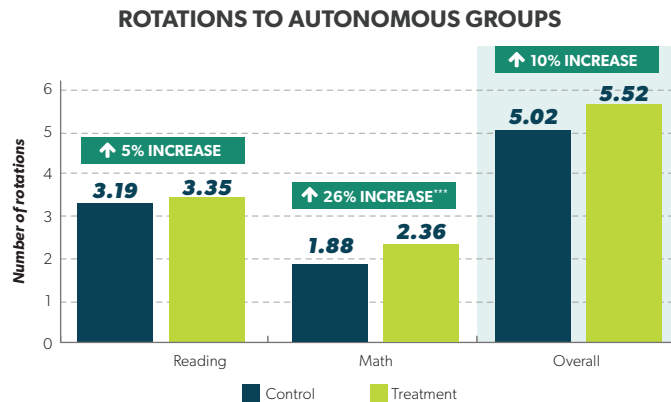
² Supervisors are responsible for providing guidance and support to Ndaw Wune tutors. Each supervisor oversees 10 tutors. As there are many touch points between tutors with the same supervisor, we randomized at the supervisor level to minimize the likelihood of solutions provided to the treatment group from impacting the control group.

Tutors spent more time with autonomous groups

Tutors in the treatment group rotated to autonomous groups .48 more **rotations** on average, representing a statistically significant increase of 26%, during the math portion of the class compared to tutors in the control group. When combining both the math and reading portions of the class, tutors in the treatment group rotated to autonomous groups 0.5 rotations more on average than those in the control group (an increase of 10%). This result was not statistically significant, however, nor was the increase in number of rotations to autonomous groups during the reading portion of the class.



A rotation is any instance where a tutor spends more than 1 minute, 30 seconds with an autonomous group.

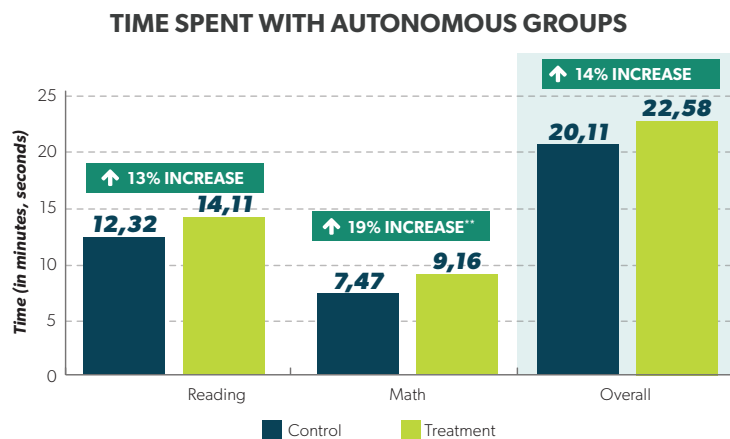


Reading: N=176, P=.70; Math: N=176, P=.003***; Overall: N=178, P=.29

“The reminders [in the lesson plan] really help me to know when I pull the trigger to go to the autonomous groups. Yes, you have to rotate, you have to go to the other [autonomous] groups to see what the students who are on their own, what they’re doing.”

—Tutor in the treatment group

In the math portion of the class, tutors in the treatment group increased the amount of time they spent with autonomous groups by 19%, a statistically significant increase over the control group. During the entire class, tutors spent 2 minutes, 47 seconds longer on average with autonomous groups than tutors in the control group (an increase of 14%). However, this result was not statistically significant, nor was the increase in time spent with autonomous groups during the reading portion of the class.



Reading: N=176, P=.27; Math: N=176, P=.017**; Overall: N=181, P=0.13

“The updated tutor guide and icons really allow me to manage time and also not to favor certain groups like, for example, being at the relearning level and forgetting the autonomous group.”

—Tutor in the treatment group

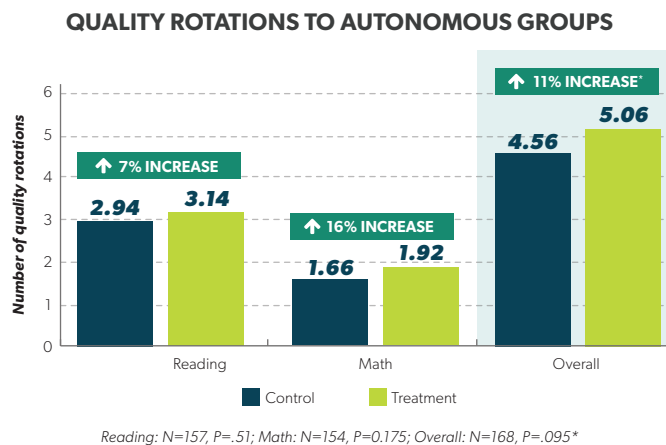
Time spent with autonomous groups was of higher quality

Overall, tutors in the treatment group performed 0.5 more **quality rotations** to autonomous groups than those in the control group, an 11% increase. This change was statistically significant, and was largely driven by the increase in quality rotations to autonomous groups in math.



A quality rotation is defined as a tutor performing at least three of the following five behaviors during a rotation to an autonomous group:

1. Ask if students have any questions
2. Check the work of at least two students
3. Provide corrective feedback to students
4. Offer positive reinforcement (e.g. *good job, well done*) to at least two students
5. Share the next set of instructions



“ We have to give students the means to succeed. So that means spending time with the relearning group and the autonomous group. I really have to make sure that both groups have the same support and also the same understanding of the exercises.”

—Tutor in the treatment group

The interventions were particularly effective at impacting tutor behavior during the math portion of the class. We hypothesize³ that this may be due to tutors having more material in the lesson plan to cover with the relearning group in reading than in math. This might cause tutors to focus more on the relearning group in reading despite being aware that they should rotate to the autonomous groups and having reminders to do so. We expect the impact of the interventions to be more limited if tutors do not have the opportunity or time to rotate.

The results indicate that the behavioral interventions increased both the amount and quality of support that tutors provided to autonomous groups. They also improved the likelihood that tutors set up their classrooms in a manner most conducive to keeping students on-task. Although the changes in number of rotations to and time spent with autonomous groups are relatively small, they represent an improvement in tutors’ interactions with autonomous groups. Additionally, these improvements were driven by a relatively simple-to-implement and low-cost suite of interventions (costing approximately an additional 4 cents in USD, or 25 CFA franc, per student), as they built upon existing Ndaw Wune program training, materials, and communications with tutors. Given the small sample size and promising results from this pilot, we expect the interventions to be impactful if scaled. ARED has already started to scale these solutions to all tutors in the Ndaw Wune program.

³ We explored the possibility that the interventions were more effective in the math portion of class because it is easier for tutors to rotate and spend time with one autonomous group as opposed to two autonomous groups. However, additional analyses we conducted did not support this hypothesis.

Recommendations

Classrooms in developing countries often have different groups of students within the same classroom due to large class sizes, multigrade teaching, differentiated instruction, or other pedagogical reasons. While these approaches help manage limited resources and provide more personalized instruction, they also present challenges in ensuring all groups of students receive adequate attention and support.

Our research project highlighted behavioral barriers that may prevent teachers from providing adequate support to all groups, and developed and tested cost-effective and simple-to-implement interventions to overcome these barriers. Based on our findings, we recommend that organizations or ministries of education implementing FLN programs that utilize teaching methodologies with multiple groups of students in the same classroom, or that rely on teacher rotation to various groups, consider the following:

- ▶ **Frame the groups as equal:** Avoid prioritizing or emphasizing one group over another in training, program materials, or communication to teachers.
- ▶ **Incorporate role playing and role modeling exercises into teacher training:** Provide opportunities during training for authority figures or coaches to role model and teachers to role play specific actions.
- ▶ **Develop clear guidance:** Provide simple and clear guidance and principles (through training, materials, and communications) about how much time to spend with each group and what to do when supporting each group. Reemphasize the guidance through ongoing communication.
- ▶ **Use visuals to convey important information:** Use simple visuals to minimize text and highlight key information as a way to help teachers quickly grasp and implement recommended practices.
- ▶ **Utilize reminders:** Create reminders to rotate to different groups of students through channels that teachers pay attention to or utilize often (e.g., teacher guides, WhatsApp groups, posters in classrooms).
- ▶ **Leverage the middle tier of education systems:** Utilize the middle tier, such as coaches and supervisors, to strengthen and support the implementation of managing multiple groups of students within the same classroom. This can be done through ongoing guidance, monitoring, and targeted feedback to teachers.

Many programs already exist to help students get the literacy and numeracy skills they need. Behavioral science designs like these can help amplify those existing efforts, meaning that teachers and other educators are more effectively and efficiently achieving their goals: helping every student learn what they need to lead fulfilling lives.

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