

TAKING ACTION:

HOW YOU CAN EFFECTIVELY USE INTELLIGENT PRACTICE



SIYAVULA
TECHNOLOGY-POWERED LEARNING

6 USE CASES

1. Regular, goal-directed practice
2. Active learning during class
3. Continued revision for accumulated benefits
4. Revision during class
5. Collaborative and peer-to-peer learning
6. Monitoring and reporting

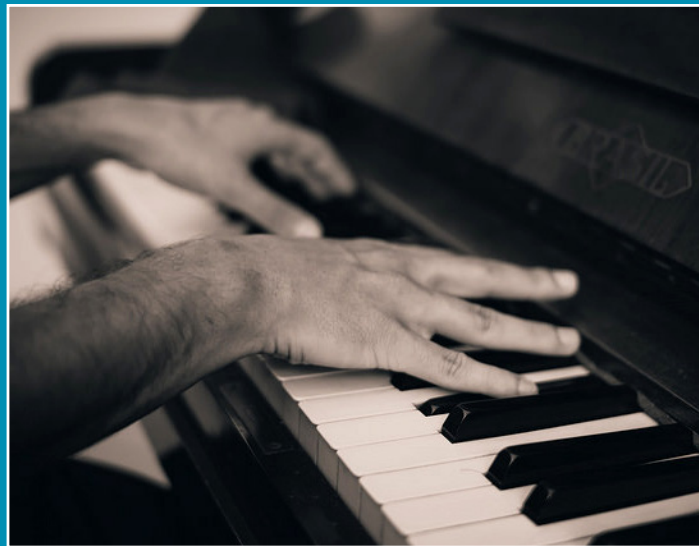


1 REGULAR, GOAL-DIRECTED PRACTICE

Practice is essential to learning, especially in Mathematics and the Sciences. It sounds simple, but identifying relevant, regular practice that fosters the learning process in each individual can be challenging and time consuming. Research has shown that to facilitate the most effective learning, practice needs to be **focused** on a specific goal, target **an appropriate level** of challenge or difficulty and there must be a **sufficient quantity** and regularity of practice to allow for mastery.

As a teacher, you want your learners to “practice smarter, not harder”, but what does that mean and how do you achieve this?

Consider someone learning to play the piano. Studies looking at the best players and most effective learners have identified that the top strategies they employ are to do with how they practice. Top pianists also make mistakes when learning a new piece, but what predominantly sets them apart is their goal to firstly identify the source of their error and then target their practice on the weak area until they have mastered it before moving on.



As is well known, there is huge benefit in doing immediate, regular practice so that learners can solidify and reinforce the skills and concepts you have taught in class. Whether you select specific exercises from a textbook for learners as homework or encourage them to practice in their own time, the use of Intelligent Practice can feed into this process.

Using Intelligent Practice requires a shift in how you might set practice or homework. Where before you may have selected specific exercises for learners to practice as homework, this might be sufficient for the majority of the class, but perhaps not for each individual learner. Now we move towards goal-directed, individualised practice. You also want the practice that learners do after class to be targeted to their unique needs and focused on their varying weaknesses and strengths. Crafting a set of practice exercises to suit each learner's needs is possible but very time consuming.

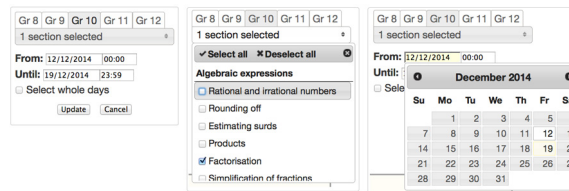
This is the benefit of using Intelligent Practice - the service automatically determines what each learner needs to practice to promote the greatest and most efficient learning whilst aiming for the goal you have set.



HERE ARE SOME GUIDELINES:

- When you have finished a section in class, you can set learners a task of practicing that section on Intelligent Practice outside of class. During this phase of the learning process, you want learners to first achieve focused practice. This means selecting individual sections from a chapter to practice at a time. You need to decide, based on your class and your own teaching practice, how many times per week or month you set such a task.
- Give learners a **goal** for the task. The assigned goal could be any one of the following:
 - Learners must obtain a certain level of mastery for the section, for example 3 or 3.5 stars, which will be a good measure of their **ability**. (The goal will vary depending on the needs and level of your class).
 - Learners must complete a target number of exercises for the section or chapter, which will be a measure of their **effort**.
 - You could even set learners a goal of practising a specified section for a time period.
 - Over and above your goals, learners can also set and aim for their own goals, which is discussed more in the context of continued revision.

- During practice on a specific section, learners will be given a sequence of exercises that is automatically determined by the system. If they are battling with a specific skill, they can choose to override the system's choice of the next exercise and "Try another exercise like this" to practice the skill further.
- After setting practice for a section, change the **filters** on your **Teacher's Dashboard** to view only the work covered for a specific time period (such as the past day) and specific section(s).



- By filtering to see your learners' *relevant* practice data according to the task you set, you will be able to see learner's mastery and number of exercises completed. This data is displayed in graphs and also in a "**Class Summary**".

Class summary				
Name	Exercises	Points Achieved	Points Attempted	Level of Mastery
Sarah	162	225	268	2.1
Naomi	75	93	149	1.0
Ariella	198	243	325	1.7
Daniella	110	148	219	2.3
Derrick	77	118	128	2.1
Georgina	0	0	0	0.0
Mlungisi	117	183	229	2.4
Simran	178	227	269	1.9
Shannon	246	308	340	1.6

- By analysing the information on your dashboard, you will also be able to see which exercises they battled with the most and may not have understood in class, listed in the "**Exercise Summary**". You can then decide if you want to spend a few minutes at the start of a lesson going over the exercise they battled with the most as a class, making it a more effective and efficient use of time.

We know that goal-directed practice alone is insufficient - it must be coupled with **targeted feedback** to promote the greatest learning gains. And the sooner the feedback and the more often, the better. However, there often is not enough time to go over homework during class and waiting for the results from a test may be too late. Using Intelligent Practice, learners get immediate feedback as the exercises are automatically marked. They are provided with a full solution after each exercise. Encourage learners to go through the solutions which act as worked examples. Research has shown that studying worked examples frees up cognitive resources, allowing learners to analyse the key steps and reasons behind the problem-solving moves. The detailed, step-by-step solutions are one of the key features of Intelligent Practice.



2 ACTIVE LEARNING DURING CLASS

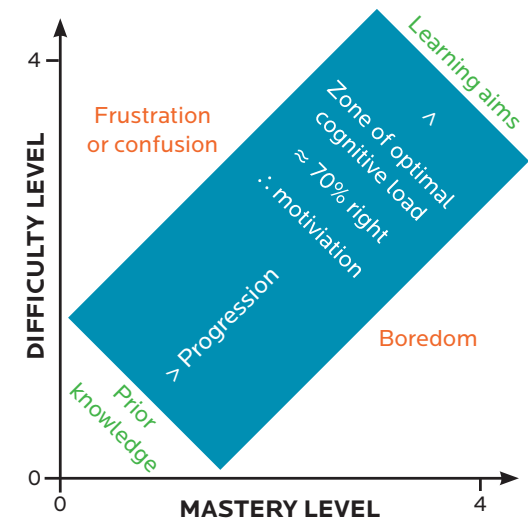
Recent research into how we teach and learn has shown that we need to question the traditional lecturing model, particularly in STEM fields. A constructivist approach of “learning by doing” has a much greater impact on performance as opposed to passively listening to a teacher or instructor.

Active learning engages us in the process of learning through a widespread use of methods, such as activities, worksheets or discussions in class.

It emphasizes higher-order thinking and often involves group problem-solving. Although the traditional, instructor-led, “teaching by telling” approach is more prevalent at university level, we can improve learners’ performance and engagement in our Mathematics and Science classrooms by providing more opportunities for active learning, particularly through practice.

Furthermore, to ensure that active learning through practice has a significant effect on learning, the practice learners do needs to be at the **appropriate level of challenge**. An appropriate level of challenge is neither too difficult (otherwise learners struggle too much, become frustrated, confused and possibly give up) nor too easy (otherwise learners become bored and are not pushed to improve). In order for learners to progress and master the concepts they are practising, they need to remain in the **zone of optimal cognitive load**. It is within this zone of appropriate challenge, that learners stay motivated to learn and improve.

Depending on your teaching practice, you may set work during class time for learners to practice the various concepts and skills you are going through, whether using exercises from a textbook or worksheets. This is active learning. However, as each learner is unique they would benefit far more if the practice they did was at the appropriate level of challenge according to their needs. Doing this



for each child individually so that they do not become too bored or too frustrated, is possible, but also difficult, time consuming and tricky to implement in a classroom.

The algorithm behind Intelligent Practice aims to push learners at the appropriate level of challenge so that they on average get exercises right **70% of the time**. Therefore, as they stay motivated to practice and progress, their mastery improves and they will get more and more difficult exercises. Furthermore, learners will get immediate feedback from the system during class. This means reflection and learning does not have to wait until marked work is returned.



HERE ARE SOME GUIDELINES:

1. You can schedule a dedicated session in your time table for the use of Intelligent Practice during class to promote active learning.
2. Start by introducing a section in class to establish the basic context, and then get learners onto Intelligent Practice to work through the section, either on their own device or in a computer lab. This could be once a week, or once every second week. You need to determine the frequency that works for your practice.
3. Learners should start practising the section independently. The system will automatically determine the optimal level of difficulty for each learner in your class, based on their individual needs, so that they are challenged, but motivated, throughout the lesson.
4. Learners will need paper or a notebook for their calculations. They only input their final answer into the system.
5. Encourage learners to discuss their problems, methods and where they went wrong and right with each other.

Explaining their method to each other is less intimidating than explaining to an educator to get feedback. Additionally, having the model solution presented after each exercise ensures they don't veer off course and propagate misconceptions when discussing with each other.

6. Your role as the teacher is the **facilitator**. Walk around the class to see which learners are stuck on a problem. Either ask a classmate to assist them or help them yourself. When you see a learner is struggling, make sure they are reading the model solutions. Once they have done that, if they are still struggling **ask** learners to tell you **what** they don't understand or **where** they stopped understanding, rather than simply stating "I don't understand". The idea here is a constructivist "*ask don't tell*" approach for active learning. Do not just give them the answer.
7. Throughout the lesson, you should monitor your Teacher's Dashboard, with the relevant time and content filters set to only show your learners' practice during that period.

8. With 10 to 15 minutes of the lesson remaining, generate your dashboard and identify the exercise that the class as a whole battled with the most (the **worst performing exercise**), using the "Exercise Summary".

Exercise Summary

This table shows the **average performance of the entire class** for each type of exercise. The exercises are ordered from best performance to worst, to show which exercises were easy for all learners (near the top of the table) or difficult for all learners (near the bottom).

Word problem: using ratios to break down totals Filed under Euclidean geometry > Ratio and proportion View	20 / 20 = 100%
Proportions with diagrams Filed under Euclidean geometry > Ratio and proportion View	8 / 10 = 80%
Further arrangements of outcomes without repetition Filed under Probability > Application to counting problems View	22 / 28 = 79%

9. Bring up an instance of this exercise on the projector or whiteboard to **work through collaboratively** as a class. After inputting an answer, you can then display the model solution.
10. Depending on your classroom set up, you could alternatively ask learners who have been struggling with that particular exercise to "gather round" and have a **more focused intervention** for those who need it, whilst the other learners carry on practising until the end of the lesson.

This use case can also be considered in terms of a "*flipped classroom*" or "*blended learning*" where class time is predominantly used for active learning through practice, discussion and feedback, rather than lecture-style teaching.



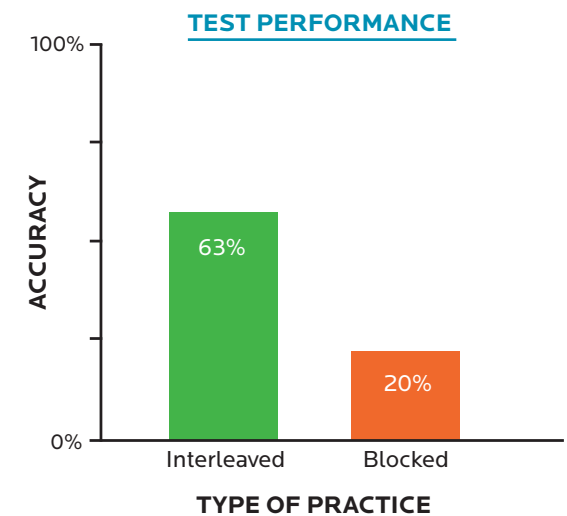
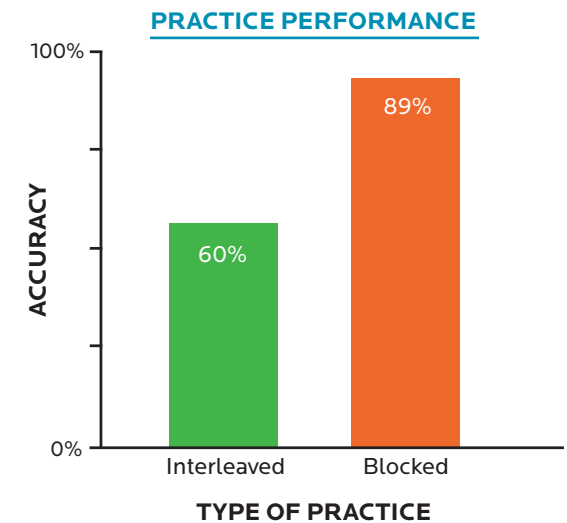
3 CONTINUED REVISION FOR ACCUMULATED BENEFITS

Regular homework is beneficial to the learning process as it provides high-quality practice of skills and concepts covered in class. But, often due to time constraints, this mostly only provides learners with a single opportunity to practice and master each concept, before moving on to the next one. Additionally, this practice is often focused on a single skill or topic at a time, in what is called “**blocked practice**”. One of the dilemmas facing learners, and teachers or instructors, is that blocked practice seems beneficial. While you will probably see a rapid increase in performance and learning seems to be optimal during a practice session, it does not promote long term retention of knowledge.

More recently, studies have shown that “interleaved practice” is a far more effective technique to increase your ability to learn and retain information.

As shown alongside, studies found that students using interleaved practice performed worse than their counterparts using blocked practice during the practice session but performed better when tested at a later date.

Consider if you want to learn the concepts A, B and C, then blocked practice would look like AAABBBCCC, whereas interleaved practice would look like ABCABCABC (in series) or ABACBABCA (randomised). Using Intelligent Practice, learners will experience interleaved practice, whether using the service for regular, targeted practice or continued revision, as the system automatically determines the sequence of the exercises which is best suited to the learner’s needs. However, learners can choose to override the system if they click “Try another exercise like this” to spend some time drilling a certain concept or skill. But, they will always be drilling these component skills within the context of the whole section or chapter, which is crucial to developing mastery.



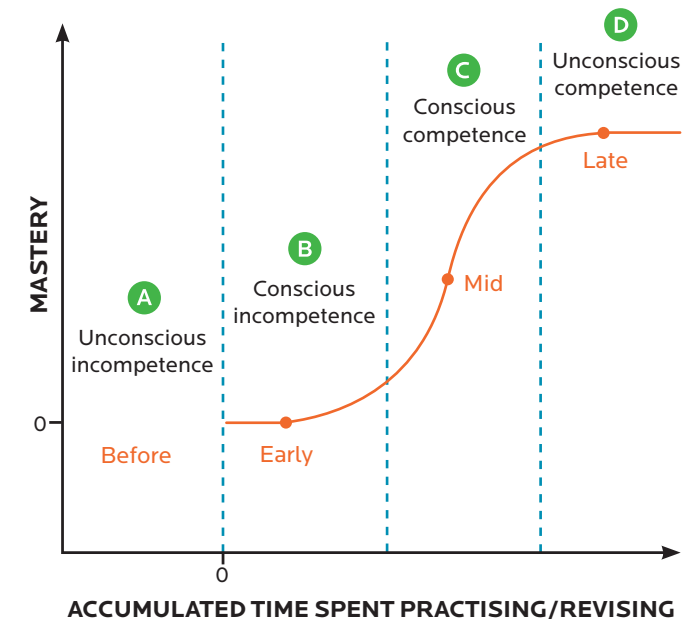


Over and above targeted practice, learners need a sufficient *quantity* of practice for the **benefits to accumulate**. Learners underestimate the need for continued practice for revision to solidify learning.

They assume that once they have mastered a skill, they can move on. These benefits build up gradually over time, and the rate of increase varies depending on which phase of the learning process you are in. Consider the following graph and the descriptions below:

- A. Before a learner starts practicing, they are **unconsciously incompetent**, as they do not yet know what they do not know.
- B. During the early stages of practice, learners advance to a state of **conscious incompetence**. During this stage, they will make mistakes and have to spend a significant amount of time practicing *without* seeing a correlated significant change in mastery or performance. It is crucial to push through this stage of practicing.
- C. As learners practice more, their mastery starts to develop more rapidly and they become **consciously competent**. However, at this stage they still have to think and act deliberately when solving problems.
- D. The last stage of mastery, after spending more time practicing, is when learners move into a state of **unconscious competence**, where component skills and knowledge for the section become automatic.

What often happens is a concept is taught in class and learners perform some follow up regular practice. They may even get to stage 3 in the development of mastery, but, they do not spend a sufficient quantity of time practising for those skills and concepts to move into their long term memory. One of the reasons for this is that by that stage, they are not seeing a measurable change in mastery, as is seen in the graph as it plateaus again. Learners therefore perceive there to be no benefit in continued revision and so stop practising.



Continuous revision may seem obvious, but putting it into practice is difficult. It can be very time consuming to find and set relevant, sufficient revision for your learners and then to mark it. This is where Intelligent Practice can be used for effective, continuous revision that is personalised for each learner. Each exercise on Intelligent Practice is actually a template from which many different versions of the exercise can be generated. This ensures there is a vast number of practice items available so that learners will never “run out” of practice.



HERE ARE SOME GUIDELINES:

1. When you would like learners to revise what you have learned over a longer time period, encourage or assign learners to practise a whole *chapter*, not just individual sections, on Intelligent Practice. For example, this can be done firstly at **1 week** and then at **2 weeks** after completion in class for consolidation and revision. Each learner will also be practising at the appropriate level of difficulty according to their practice history so that revision is targeted and they stay motivated. Include a timeframe for the revision session, such as practise the chapter for 1 hour.
2. Learners can easily identify their weak areas to concentrate on those concepts for further **deliberate revision**, where they can choose a specific section to practise.
3. However, you must also encourage learners to mix in **older material**, that they may have already mastered, into a practice session on more recent material. This has the advantage of leveraging the benefits of interleaved practice and accumulated time spent practicing. Learners should aim to do such a practice session every 2 to 3 weeks to consolidate concepts across several chapters.
4. Constant revision is a challenging, demanding process for learners, but using Intelligent Practice learners can track their progress and effort so that they can see they are moving forward.
5. As a teacher, you will then be able to view the continued revision done by your learners on your dashboard. Select the relevant filters, for example to show all practice history for the previous 3 weeks.
6. Identify which concepts are the worst performing and which learners are still battling with chapters you have finished with in class. This can inform whether you need a targeted intervention or revision session with your class or an individual.
7. If you decide to only use Intelligent Practice as an additional, continuous revision tool for learners, you can still correlate your learners' effort over the term with their improvement in test scores.



4 REVISION DURING CLASS

Lesson time during the day is very valuable and it is often difficult to find time to go over homework during class. Additionally, marking homework and giving feedback individually is very time consuming. The benefits of learners regularly practising on Intelligent Practice, whether through assigned homework practice or continuous revision, is that the exercises are automatically marked. Reflection takes place immediately as learners are able to go through the worked solution and try another similar exercise, if they feel it necessary.

This frees up your time as a teacher to analyse where you can best spend your resources and time for the most effective teaching and learning.

One of the ways to do this is to make your limited revision time during class more effective. You can use Intelligent Practice both to inform what revision to do, based on the needs of your class, and to carry out the actual revision session. This is firstly applicable for **short-term revision**, for example of the previous day's or week's work.

HERE ARE SOME GUIDELINES:

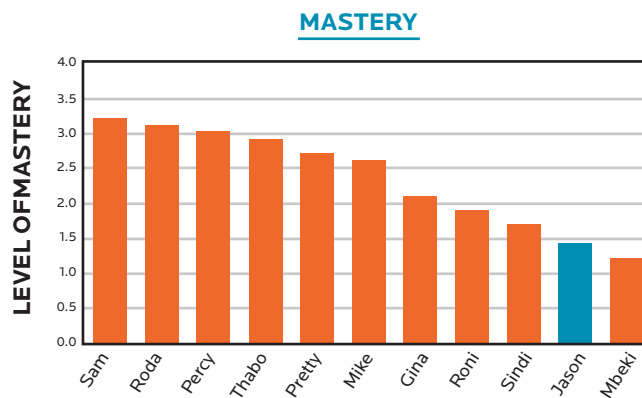
1. Decide on a contained time period to allocate to revision at the start of a lesson, for example 10 minutes, before moving onto new content. The aim of short-term revision is to consolidate concepts covered recently. This helps you to identify problem areas early on and potentially break down any misconceptions before they become entrenched.
2. Instead of just asking learners to volunteer a suggestion of what they have been battling with most, or a specific exercise they want to go over from homework, rather use your Teacher's Dashboard to help you identify where revision is most needed for the class as a whole. This way you know your limited time for revision time will be the most effective and have the biggest impact.
3. Before the class, change the time filters on your dashboard to show your learners' practice history for the last day (for example if you set them homework the previous day). Alternatively, you can change the content filters to show only the work you have covered in the last few days in class and your learners' practice thereof.
4. Navigate to the "Exercise summary" box to determine which exercises were the worst performing for the class in general. You can then bring up a version of these exercises, by clicking "View". For example, you could decide to do one question from each of the three worst performing exercises.
5. A suggestion is to first ask learners to solve the problem themselves, then input an answer volunteered by one of the learners, and then go through the fully-worked solution which is displayed after you check the answer, making sure learners understand each step.
6. A further benefit to this approach is that the question generated will be a version of one similar to what learners would have done during homework, but not be exactly the same. Therefore, even the top learners who got it right during homework, will still have to solve the new version of the exercise, meaning they are still engaged, getting further practice and the revision time is useful to them too.



You may decide to dedicate a whole lesson to a more consolidated revision session. Such a revision session is useful as it will cover a longer time frame, for example, before a test or exam. If you have encouraged your learners to do continuous revision throughout the term, and/or you have set dedicated homework practice on Intelligent Practice, then you will get immense value from using their practice history to inform what to cover in a **long-term revision** session.

HERE ARE SOME GUIDELINES:

1. Inform learners before the time that you will be using a lesson for long-term revision, for example of the previous month's, term's or half year's work. This way, they can also bring any questions they may want to focus on.
2. Prior to the lesson, spend some time analysing your learners' practice history on your dashboard:
 - a. Change the filters to first include all content practised for the given time period (for example, the last term). Identify the worst performing exercises for the class as a whole. Assess whether these exercises predominantly come from a **specific chapter** that you should spend more time revising. Or perhaps, the worst performing exercises come from a range of chapters, but there is a **specific skill** common to solving these problems that the majority of your learners may not yet have mastered.
 - b. If you know there is a specific chapter that your learners have found difficult, now change the content filter to focus on only the practice history of that content over the time period, for example the last term. You will notice the mastery scores will also change each time you change the filters. Have a look at the Mastery plot and determine which of your learners are battling most, and with which content.



3. Using the insights you have gained from the above observations, you can now plan and structure your revision session such that it focuses on the most common problem areas, either in content or in skills.
4. During the revision session, you can also use Intelligent Practice to bring up a question to work through. This will also save you time in preparation and you know you will have a fully-worked solution on hand to go through as revision. As before, ask learners to work out the problem individually and then you can either ask a learner to verbally describe their working or even write up their solution on the board.
5. Additionally, you will know which learners you should keep an eye on during the revision lesson. You will probably already know this just from engaging with your learners during teaching, but the analysis of your Dashboard will reinforce exactly which learners to give extra attention to and perhaps identify some struggling learners who you were not aware of before.
6. After you have used Intelligent Practice to firstly plan and structure your revision lesson, and then administer relevant exercises for the class to work through together during the lesson, leave some time at the end for individual learners to volunteer specific concepts they might want to revise. This helps them take ownership for their own learning and they can also use their own Learner Dashboard, in a similar way, to see what they have battled with the most.



5 COLLABORATIVE AND PEER-TO-PEER LEARNING

Many schools and institutions promote instructional methods that give learners the opportunities to generate their own questions, discuss issues, explain their reasonings and engage with their peers in a meaningful and constructive way. Practising such skills during school is being recognised more and more as a crucial part of the development process.

It is misleading to see teachers as the only people learners can learn from - they can learn from each other too. Learners need to be active participants and not just passive recipients in their learning.

Two such group learning strategies are:

1 Collaborative learning: Learning *with* each other

- This technique is best employed when a concept is first introduced and learners need to grapple with their understandings and misunderstandings.
- By working in small groups to discuss problems and find solutions together, learners take their understanding a stage further.
- When learners interrogate and understand the content together, research has shown this process helps learners attain higher level thinking and long term memory of the material.

2 Peer-to-peer learning: Learning *from* each other

- This technique is best employed when you have some learners that have mastered a concept, section or chapter whilst others are still battling.
- Encouraging the faster learners to help others is a good idea and peer-to-peer learning is helpful for both the “novice” and the “expert”.
- Studies have shown that the cognitive process of explaining solutions, and dealing with questions and misunderstandings will help to embed knowledge further into long-term memory and enhance understanding of the subject.

Peer-to-peer and collaborative learning can be employed in conjunction with Intelligent Practice to combine the benefits of the programme with the benefits of these learning strategies. The previous case studies described have assumed that there is one-to-one device availability for learners. In many schools, this is not the case. If devices are scarce, there are still ways in which Intelligent Practice can be a key enabler and there is real learning value. The group learning strategies are easily implementable in **device-scarce contexts**.



HERE ARE SOME GUIDELINES:

1. Allocate a period to use Intelligent Practice for group work. If learners need to share devices, make sure to ask those who have, to bring them to class.
2. Break learners up into small groups (at most 3 or 4) with a single device or in a computer lab with a single machine in the group.
3. **For collaborative learning:**
 - a. You want learners in a group to be of a **similar ability** level. Use your past experience of their ability, test scores, or else navigate to your Teacher's Dashboard to assess learners' overall mastery levels to allocate them to relevant groups.
 - b. Allow the groups to log in with any account belonging to someone in the group.
 - c. After assigning a section or chapter to practice, the learner operating the device navigates to the first exercise.
 - d. Each learner in the group must first attempt the exercise on their own. They then compare their answers and discuss their methods so that everyone participates meaningfully.
 - e. After interrogating and clarifying their methods, the group selects one answer to submit.
 - f. When the answer and solution are presented, learners then discuss their

answers. Explaining one's reasoning in a comfortable environment to peers is a very powerful learning tool.

- g. Learners then progress to the next exercise, selected by Intelligent Practice, and the sequencing and level of difficulty will be most appropriate at the group level. This is why learners should be broken up into groups according to similar ability.
 - h. This process is more appropriate once initial concepts have been introduced and learners are first grappling with their understanding together, for example as active learning.
4. **For peer-to-peer learning:**
 - a. Allocate learners to groups that are of **mixed ability**.
 - b. You can use a similar process for collaborative learning, but learners have different roles within the group. Namely, one learner assumes the role of the tutor who will lead the rest of the group through the problem.
 - c. As before, learners should go through the exercises, but now the focus is on knowledge transfer where the one learner actively explains and helps the other learners in their understanding.
 - d. This strategy might be used less often than collaborative learning and is more

applicable at the end of a chapter, for example as a revision session.

5. The benefit of using Intelligent Practice is that learners will have the model solution as a reference to work through, even if no one got the correct answer. In this way they do not propagate misconceptions. Learners can then try another exercise like it, to make sure the whole group understands, or move onto the next exercise.
6. Your role is the facilitator, paying special attention to the group dynamics:
 - a. make sure all learners are contributing and working through the exercises.
 - b. for collaborative learning, keep an eye on the weaker groups so that you are available for assistance.
 - c. in peer-to-peer learning sessions, don't position the same learner as the "expert" each time.
7. With 10-15 minutes of the period remaining, generate your dashboard and talk through the exercise(s) the class struggled with the most.

You can apply the above group learning strategies to after school assignments, regular practice and revision sessions. For example, encourage small groups to meet together and revise the week's work during one afternoon in a similar manner, using a shared device.



6 MONITORING AND REPORTING

One of the major benefits of learners using Intelligent Practice is that you can monitor their progress and performance over time. Even if you do not make active use of Intelligent Practice in class or assign specific homework practice, you can still encourage individual use, for example continuous revision. You can then use the data analytics on your dashboard for **long-term monitoring** of your learners' progress and mastery.

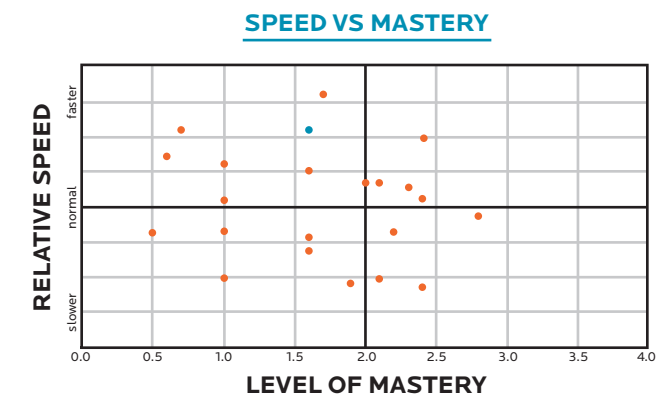
By checking your Teacher's Dashboard periodically, you can instantly gauge your overall class performance and gain insights that you might not have made otherwise.

Continuous monitoring of your learners' practice history will help you to constantly revise and make small adjustments to your teaching practice, based on the needs of your learners. You will also be able to continually assess their progress throughout the term so that you have additional information to add to formal assessments, such as exam and test scores, to provide a more robust measure of a learner's effort and performance in the subject.

You can use the data on your Teacher's Dashboard for **reporting**. Firstly, through continuous monitoring, you can then report back to **individual learners** to help them progress and master their subject. Although learners will be able to monitor their own progress on their dashboards, much research has shown that if learners perceive their environment to be supportive, their **motivation** will be enhanced. It is often difficult to identify and give each learner the feedback and support they need.

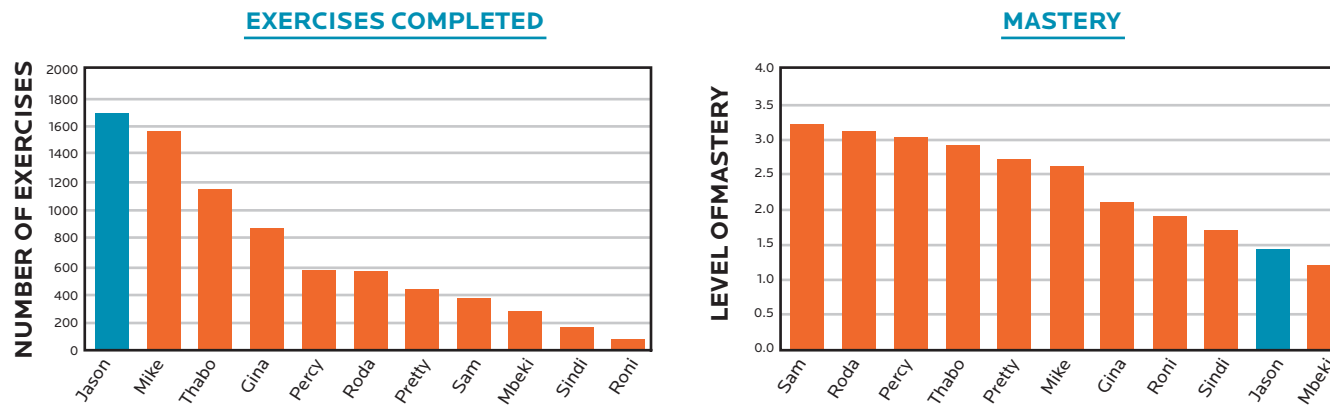
However, making use of Intelligent Practice, you can save time by easily identifying meaningful feedback to give individual learners based on where they are struggling *and* where the excelling:

1. By comparing the number of exercises practised over the term and test scores, you can help individual learners establish the link between putting in effort practising and revising (the input) and their results (the output).
2. By monitoring your learners' speed as well as mastery on your dashboard, Intelligent Practice can help you to help your learners prepare better for tests and exams. Some learners may be progressing well and mastering concepts on Intelligent Practice, but they do not feel this is reflecting in their test scores. You can use the mastery versus speed plot to help diagnose why this might be the case. In the plot below, learners in the bottom right quadrant are accurate, but their speed is slow. They may therefore be mastering concepts on Intelligent Practice, but in a test situation, the time taken may be a factor affecting their overall performance. They therefore need to practice to improve their overall speed.





3. By comparing learners' effort (the number of exercises practised) and their mastery, for a given time period, such as the term, you can help learners diagnose how they are practising and if they need to make any adjustments. For example, the plot below shows the learner highlighted in blue as having a high number of exercises, but a relatively low level of mastery. After feeding this back to the learner, you might find that they often click "Try another exercise like this" instead of progressing to the next exercise determined by Intelligent Practice. This will allow them to accumulate points and number of exercises completed, but will slow down their progression to more difficult items, and therefore their mastery.



Secondly, you can use the data on your dashboard to **report on your class' overall performance** to the Head of Department. Or if you are the Head of Department, you can compare how individual classes are continuously progressing throughout the year, without having to wait for test and exam results. By analysing the data over time, you can identify if there are any patterns or trends in mastery across classes or even across a grade, and whether these are correlated with a specific teacher or time of year. These types of insights need to be assessed within the context of your school and could help you identify external factors which might have an influence on learners' performance over time.

Thirdly, you can use your dashboard and filter for the data on individual learner to use in **reporting at parent interviews**. The above suggestions for how to report back to a learner can also be used to report back to a parent to help them gain insight into their learners performance. For example, you can make it explicit to a parent about the amount of effort a learner has put in over the term in practising and how this might be correlated with their results. Or perhaps you can show a parent how their child's speed is faster, but level of mastery is low, which could indicate that the learner is making careless mistakes. This type of quantitative reporting adds an extra layer of depth to your feedback to parents.

Overall, the science and art of data analytics and making data-driven decisions is becoming more and more prevalent in our society, and cultivating these skills as a teacher will make your feedback, reporting and teaching practice even more reflective and effective.