



HotTOPIC

A Class of 40 Needs

In any class, there will always be a mix of different abilities. But if you think differentiated instruction is about just giving different worksheets to different students according to their different abilities, you're only half-right.

Many think differentiated instruction is about teaching students of diverse abilities. A common way of doing that is to diversify the tasks and activities we give to students of different abilities. But there's more to it than that.

Differentiation is about meeting the needs of our students, says Dr Letchmi Devi Ponnusamy. It's an instructional strategy, but it's also a bigger philosophy behind the way we teach.

"It's not about getting the learner to know all the facts or information," explains Letchmi. Differentiation is about helping our learners to make sense of what and why they need to know something. And that's just the starting point.

Effective teaching should address three fundamental needs of our students: their level of *readiness*, *interests* and *learning preferences* (Tomlinson, 2001).

Ready, Get Set, Learn!

What are our students supposed to learn? Teachers will readily point to the learning outcomes in the syllabus. But how *ready* are they to learn what you are teaching?

There are many ways a teacher can differentiate what is taught: by changing the content, process, product or environment. For example, if you think of a topic as a cake with multiple layers, you can tier the content in three layers: basic, intermediate and advanced.

The same idea applies to process skills: Students who need more structure can be given step-by-step instructions to follow, while those who are more independent can work it out for themselves.

Teachers tend to "tier" their lessons according to their students' ability to understand the content. But they should consider their students' level of readiness to learn as well. The best way is to find out directly from learners where they're starting from.



Differentiation is really about knowing the learners' capabilities so that you can stretch their learning a little bit more.

- Letchmi Devi Ponnusamy,
Early Childhood and Special Needs
Education Academic Group

Differentiated Instruction

- >> How can differentiated instruction meet learners' needs?
- >> Is it possible to teach different skills in the same class?
- >> What effect does classroom environment have on learning?
- >> How can students with special learning needs be supported?
- >> What can schools do to grow teachers' skills in differentiation?

Web Extras! Go to <http://singteach.nie.edu.sg> for more stories.

f Find us on Facebook at <http://www.facebook.com/SingTeach>

Teachers need to be aware that children walk into a classroom having different types of interests.

- Letchmi on addressing students' interests

Reference

Tomlinson, C. A. (2001). *How to differentiate lessons in mixed ability classrooms* (2nd ed.). New Jersey: Pearson.

Letchmi Devi Ponnusamy is the Guest Editor of this issue. She is a Lecturer with NIE's Early Childhood and Special Needs Education Academic Group. She teaches courses on gifted education in the Master of Education programme. Her research interests include issues pertaining to giftedness, creativity, effective pedagogy and teacher education.

Letchmi suggests doing a "pre-assessment" right from the start. "When you walk into a class, you should try to get a sense of what the children know about a particular topic."

It could be a simple quiz, or an essay about what they have already learned. Don't just ask them verbally, but collect or record the information, she advises. Another way is to gather the work that learners have done previously.

"Differentiation is really about knowing the learners' capabilities so that you can stretch their learning a little bit more," Letchmi emphasizes. That's why it's important to know what they already know.

May I Interest You in Some Learning?

At the start of each school year, teachers often ask students: So what did you learn last year? Why not try something different and ask them: *Why* are you learning this subject?

Knowing why students want to learn and what they hope to achieve will tell you a lot about how much attention they'll give to what you're teaching.

"Teachers need to be aware that children walk into a classroom having different types of interests," Letchmi reminds us. "You've got to give them opportunities to explore things that they like to explore and tie it back to the topic you're teaching."

It may not always be possible to do this in all lessons, but helping students to see what the content can offer them helps to drive their interest in learning. That's when they begin to steer their own learning, which is an important 21st century skill for students to master.

It's also important to remember that it's not just about individual interests. "The classroom is also a social environment," says Letchmi. It's a good place for students to learn that they and their peers are interested in different things and there needs to be a balance.

So if they want to have a debate during a Science lesson, instead of having just one topic, students should get the chance to suggest issues they're interested in, and get like-minded classmates to join their group.

"You need to be able to balance between giving children time to work on their own interests, and time to work on social interests as well," advises Letchmi.

How Would You Prefer to Learn?

The third aspect is learning preferences or learning style. Some students learn better by doing, while others prefer to let the teacher talk them through a lesson.

(Howard Gardner's concept of multiple intelligences is useful in helping us understand how students learn differently. Read our previous article, *SingTeach*, Issue 33, "Engaging Multiple Intelligences in the Math Classroom".)

It's not always easy for teachers to discern each student's learning style. Even when you have that figured out, it's challenging to plan a lesson that caters to all the different learning preferences in a class.

Letchmi advises teachers to work on students' level of readiness and interests first. But knowing their learning preferences is still useful.

"Planning a lesson just on learning preferences is not a good idea, but taking that into consideration is important because then you can understand why John, who's sitting in a corner, is not so focused on you when you've been talking for the last 20 minutes."

Perhaps John is not an "auditory learner". A teacher who understands this can try to engage him in other ways instead of dismissing him as being unmotivated.

Meeting Diverse Needs

"If you just take those three aspects—readiness, interest, and learning preferences—you're looking at three different ways by which children can differ. You can go and multiply that by the number of students you have," says Letchmi. That's the number of ways your students are different from each other.

That's enough to befuddle even the most experienced teacher. How can we possibly accommodate the needs of everyone?

Differentiation is data-driven, notes Letchmi. Teachers who are doing differentiated instruction constantly take in information about the learners and then fine-tune their teaching to suit the learners' needs.

“You really have to gather information about your learner and one tricky part about teaching today is teachers are dealing with so many things. Getting the information and organizing it in some way is a really difficult process.”

But take heart, teachers, it’s not mission impossible. The more experience you have in working with different learners, the easier it becomes to recognize their needs and to meet them.

Over time, you will build up a trove of first-hand knowledge about your students and become a truly dynamic teacher.

ScienceED

Different Skills for Different Learners

A ramp, some toy cars and a sheet of paper—that’s all a group of Primary 5 pupils were given for a Science experiment. They were then left on their own to find out how height affects distance. For some, this might be cause for panic. But for this group of learners, it was a challenge they welcomed.

Some of Mrs Noelle Chow’s pupils at Xishan Primary School (where she used to teach) were accustomed to getting a blank sheet of paper during Science lessons. They weren’t given any steps to follow or structured questions to answer—and they loved it.

Of course, this approach doesn’t work for all pupils. Some groups receive step-by-step instructions, and other groups get fill-in-the-blanks worksheets. And all of these groups could be in the same class doing the same experiment at the same time.

When Less is More

Different children have different levels of skills. Now at Pei Hwa Presbyterian Primary School, Noelle purposefully adapts her teaching to her pupils’ different learning abilities, even within a single class.

In designing Science experiments, she often differentiates the different process skills that her pupils need to learn. For those who are weaker in the subject, she focuses on basic skills like content recall.

Higher ability pupils, on the other hand, are encouraged to evaluate or even create their own experiments. What variables do they need to measure? Which variable needs to change? These are things they have to figure out on their own.

“For the high-ability students, they appreciate the freedom of exploring,” explains Noelle, who has been teaching Science for over 7 years. “They don’t need to sit through their teacher’s lecture, going through point by point, and they have more time to play.”

Also, depending on the group’s ability, Noelle gives certain information to one group but not the other. For example, to encourage the more able pupils to think critically and ask questions, she deliberately withholds some information from them during experiments.

This approach is very much in line with the spirit of inquiry promoted in Science. “Inquiry depends on how much information you withhold from the students,” Noelle explains. “The more you withhold, the more they have to think on their own.”

Grouped for Success

The way in which pupils are grouped also makes a big difference when it comes to differentiated instruction. Noelle says she made the mistake of putting pupils of different abilities in the same group. She soon found that it was frustrating for all.

“If you put them in mixed-ability groups, they will drive each other crazy,” she notes. “You can really feel the tension. In the end, some pupils in the group will be passive.”

Allowing pupils to work with peers of the same ability encourages every member of the group to be an active participant. As they work and learn at the same pace, it minimizes the chance of anyone being left behind.

Noelle often starts off by grouping pupils based on their assessment results. Along the way, she makes changes to the groups, shifting pupils to a different one if they show signs of a poor fit.

Article highlights

- When does less content translate into more learning?
- How can different process skills be taught in the same class?
- Is it effective to put pupils of mixed abilities in the same group?



The more you withhold, the more they have to think on their own.

- Mrs Noelle Chow,
Pei Hwa Presbyterian
Primary School

“It’s through one or two experiments that I get to see if these students translate what I see on paper into their learning,” Noelle explains. “I would change the grouping if I find they are more suitable in another group.”

Facilitating Learning

Differentiation and facilitation must go together, says Noelle, especially for the weaker pupils. “Facilitation is very important when it comes to differentiation. If not, they will be totally lost.”

Unlike their higher ability peers, these pupils receive experiment worksheets with additional information, rather than an open-ended task. For pupils who still struggle with the experiment, help is not far away.

With the assistance of an Allied Educator (AED), Noelle guides these pupils through the experiments, ensuring that they are on the right track. She constantly prompts them with questions that point them in the right direction.

She adds that it is also important for pupils to see progress in their learning. “The groups are like that now but it’s not going to be like that forever. So they do know that groups may change. There is something they can hope for.”

And though it may take a while, her efforts pay off when pupils from the low-ability group “graduate” to the mid-ability worksheet, while those from the mid-ability group eventually join the ranks of the high-ability learners.

Managing Learning in Class

Knowing how and when to differentiate classroom instruction may take some getting used to, but Noelle encourages teachers to experiment with different ways of teaching.

From her experience, differentiation often results in a “chaotic” classroom. “My Science classes are always very noisy, but you can see from their faces that they are having fun.”

Despite the soaring noise level, Noelle feels that the fun her pupils experience from such an approach translates into their learning because things that are enjoyable tend to be more memorable. All you need are some ground rules and clear expectations.

“Be very firm about it,” advises Noelle. “If they work within the boundaries given, the noise should be acceptable.” To get their attention, she simply claps two wooden blocks together and order is restored in the classroom.

“You just have to try and don’t be afraid that the class will be very chaotic,” she adds. “The first lesson is always very daunting. But as you conduct a few more differentiated lessons, it can be fun, even for the teacher.” Dare to differentiate, and the results might just surprise you.

Facilitation is very important when it comes to differentiation. If not, they will be totally lost.

- Noelle on guiding a class of mixed-ability learners

MathED

Calculated for Success in Math

Imagine a Math classroom where all students answer freely without fear of being wrong, and where they can easily relate Math to everyday use. Dr Joseph Yeo tells us how teachers can successfully plan for every student to be engaged during their lessons, regardless of the students’ abilities.

A subject of formulas and methods, one would think Math should be taught with mechanical precision. Every step is drilled into the student, regardless of the individual’s learning needs.

But our classrooms are not made up of just one type of student. More often than not, it’s a room of mixed-ability learners. Because of this, Math teachers also face the challenge of understanding different student needs and how to address them.

Dr Joseph Yeo, who has been teaching since 1988, knows this from learning theories and personal experience.

Article highlights

- How can a low-anxiety classroom support diverse learning needs?
- Can different teaching approaches meet the same instructional objective?
- What are some ways to make Math meaningful for all learners?

“You need to pay special attention to diverse learners and differentiate the students according to their abilities. You need to understand that different students learn differently and learn at different pace.”

Creating a Low-anxiety Classroom

To support all your learners, Joseph suggests creating a low-anxiety classroom.

“Diverse learners not only have different learning styles but they will have different affective domains. Some students have Math anxiety or dislike Math,” he explains. “That’s where the Math teacher needs to create a low-anxiety environment to engage the students.”

To do this, he celebrates the “little successes”. It is not, however, just about rewarding students when they get the right answer.

“While we point out the students’ errors and correct their misconceptions, we should not belittle the students,” Joseph says. “You praise the attempt and recognize the effort.”

In so doing, you are creating a space where students feel comfortable participating actively and are not afraid of being penalized for the wrong answer.

One Objective, Different Methods

Another way to create a low-anxiety classroom is to plan your lessons with a clear objective, and one that *all* learners can reach, rather than to “teach to the middle level of a class”.

“Don’t plan without objectives,” Joseph reminds us. “Although it is for diverse learners, the objective given must be specific. And it is important that it is made clear to the students at the outset. Your specific instructional objective must always be on your mind.”

Though there may be one specific instructional objective, the method of instruction and the types of resources used could be varied to cater to diverse learners. This objective guides the choice of teaching strategy.

For example, a mathematical concept could be represented in various forms. “It can be concrete, pictorial, or symbolic,” says Joseph. “Some students prefer to act out, some prefer to be engaged in activity, some prefer to hear it, and some prefer to draw.”

Classroom activities can also be varied to engage them. “The activity that I give them can be differentiated. Different students will do different activities in the class but at the end point they achieve the same instructional objective.”

Putting Math into Context

A simple way to reach out to every student is to put what they are learning into a familiar context. He uses everyday situations that students can easily relate to so that they can understand the mathematical concept better.

“I vary my activities. I give a context that is meaningful to them, something they have experienced in their lives,” explains Joseph.

For example, when teaching percentage to learners, one of the teaching tools that can be used is dining receipts. Asking each student where he or she would like to eat at, the teacher could produce a receipt corresponding to the student’s choice, which will surely delight the student.

At this point, the student is already involved in the activity. All that is left to do is to explain how the 7% GST and 10% service charge add to the bill.

Other than using familiar resources, teachers can get students to talk about how they experience Math in their lives.

“When teaching speed, teachers can’t make the students run around in the classroom, but they could get them to narrate the experiences that they have encountered in their lives. When they talk about it, it becomes meaningful to them.”

Teaching Math to diverse learners need not be procedural. It’s about purposefully planning for it to be meaningful. And because Math is all around us, we do not have to worry about running out of ideas.



You need to understand that different students learn differently and learn at different pace.

- Joseph Yeo,
Mathematics and Mathematics
Education Academic Group

Joseph Yeo is with NIE’s Mathematics and Mathematics Education Academic Group. He teaches both pre-service and in-service Math teachers. Before joining NIE in 2000, he held the posts of Vice-Principal and Head of Department for Mathematics in several secondary schools. His research interests include mathematical problem solving, mathematical pedagogical content knowledge, and learner anxiety in Math.

Article highlights

- How can we help dyslexic students with language learning?
- Can customized learning materials benefit other students as well?
- How can allied educators work with teachers to support learning?



Children with special needs tend to fall backwards.... They need to see success in their work.

- Mr Jeyaram Kadivan,
St Gabriel's Secondary School

Supporting All Learners

As a student, Mr Jeyaram Kadivan used to dread English Language lessons. He struggled with the language and even failed the subject in school. Today, he helps young people to find a love for the language and to succeed where he failed.

Jeyaram—or Mr Ram, as he is known in school—is an Allied Educator (AED) at St Gabriel's Secondary School, which is a resource school for dyslexia support.

Ram's role is to support students with this learning disability and the teachers who teach them. He advises teachers, helps in classroom teaching, and also conducts one-to-one or small-group intervention programmes to help those with more challenging learning needs.

Creating a Love for Language

Students with dyslexia hate to read or write. Because this group of learners often has difficulties comprehending what they read, the first thing Ram tries to do is to create in them a love for the language.

"Children with special needs tend to fall backwards because despite them getting all that support, it may not be that concrete," he notes. To get them to learn and improve, he needs to increase their motivation. "They need to see success in their work," he says.

Ram carefully designs a variety of materials to help them grasp both the content and literacy skills. To make sure they don't lag behind their peers, he chooses topics that are aligned with the English Language curriculum.

So if the topic is advertisements, they may get a cloze passage and a comprehension passage about ads. They'll also look at ads, talk about them, and even design their own.

It may take up to 4 weeks to complete a topic, but Ram is in no hurry. He takes his time to make sure his learners understand the topic and to make it meaningful to them.

"The philosophy I adopt is that they don't get homework here. It's fun," shares Ram. "I really go at their level and take time to finish every period."

Universal Design for Learning

While his work is specialized, Ram has always adopted an all-encompassing approach: "Support everyone as much as possible."

Sometimes, it turns out that some of those identified as special needs students don't have a learning disability but a learning difficulty.

"Because they come from a family where their mother tongue is the most utilized language at home, that becomes an issue in school. Because they are not conversing in English, and because our teaching mode is all in English, they are struggling."

Ram found that a "universal" approach to teaching and learning is useful for students like these. Research in "universal design for learning" (UDL) has shown that curriculum materials designed for special needs students can also be used for the general student population, and everyone can benefit from it.

It's really about teaching at the level of the student and communicating knowledge in a way that they can relate to and understand.

"It's useful for Normal (Technical) classes, where there are that small group of kids who are falling through the sieve, where they are not really diagnosed with a disability. But it's going to benefit them because it's so simplified and concrete, and the terms used are based on the curriculum," explains Ram.

It wasn't until much later that he learned that researchers have given this approach a name. "We were naturally doing it, but we never knew there was a full-blown model and philosophy behind it."

Sharing in Success

As an AED, Ram is not trained to teach. His primary role is to support teaching and learning. To better equip himself, Ram took up a course on teaching English by the British Council last year. He also reads up on learning strategies and research materials to stay up-to-date.

“I felt that I really needed to know curriculum to teach them what they need. It’s not just about giving them a tool and saying, ‘You have to do this,’ but why they are doing it, how they are doing it. You really have to scaffold them and do it step by step.”

Ram is also involved in the school’s professional learning community (PLC). “I work closely with the Secondary 1 and 2 teachers in the English department, to understand what the changes in curriculum are. That keeps me abreast about what’s happening and how I can prepare these boys for the new information that they require.”

This understanding helps him to better differentiate the materials he designs for his students, to cater to their specific ways of learning.

Ram has found it helpful to share the load with fellow teachers in the PLC or school cluster. He recently collaborated with three other schools to design lesson materials. “We were sharing resources, and now I have Secondary 1 to 4 materials with me but I only did one set!”

It takes a lot of commitment but the effort pays off long into the future. “It’s basically the mindset,” stresses Ram. “You have to start small. The initial stage will always be very difficult, but as you develop the material, it’s saved up in your bank and you can utilize it again.”

Support everyone as much as possible.

- Ram on his approach to teaching

TeachED

Developing Pupils with Potential

Teachers at Mayflower Primary School are on a journey of discovery. Having established a reputation for consistently producing good results, they wanted to reach higher. They wanted to help pupils with the ability to progress further and faster to realize their potential.

The teachers at Mayflower Primary School are a commendable team, by any standard. Between them, they have garnered multiple awards, including Most Inspiring English and Chinese Teachers, and even the prestigious President’s Award for Teachers.

These accolades are by no means a chance occurrence. They are the result of years of honing their craft, of deliberately “Touching hearts, Engaging minds, and Nurturing talents” of young ones, as their school mission states.

In recent years, they felt they were ready to take on more.

Aiming High

Mayflower has developed many ways to cater to the diverse learning needs of their pupils. Various remedial programmes are conducted for those who struggle academically to ensure that they do not fall behind.

However, there was a growing concern for a small segment of the student population they refer to as “high-progress” (HP) pupils. Teachers were worried that the potential of these HP pupils was not being maximized.

“Our school has many programmes in place for the low-ability pupils,” shares Ms Teo Swee Huang, Subject Head of Innovation. “We felt that more must be done to stretch our HP pupils and meet their needs.”

“The kids know so much and that is why they can’t sit still,” adds School Staff Developer Mrs Jessie Ching-Yip. “They are not engaged with our ‘chalk talks’, so what do we do?”

Article highlights

- What are the learning needs of high-progress pupils?
- Why is it important for teachers to be self-directed learners?
- How can schools encourage teachers to develop through discovery?



Ms Teo Swee Huang and Mrs Jessie Ching-Yip from Mayflower Primary School

“We realized that although we can put them into HP classes but if we don’t train the teachers, it will be up to individual teachers’ capacity or ability. The changes would not be impactful or sustainable,” notes Swee Huang.

The school then decided to design a comprehensive structured approach to facilitate continual progress and support for teachers in providing more effective differentiated instruction for their pupils. Thus began their journey of discovery.

Dedicated to Discovery

“We call it the *Découvrez* approach,” shares Swee Huang. Meaning “discover” in French, *Découvrez* encapsulates a spirit of learning that both teachers and pupils can aspire to.

Teachers began to work towards helping pupils develop the spirit to explore content beyond the textbooks. Pupils were also encouraged to learn independently and make discoveries on their own.

“We do not want them to be spoon-fed,” Swee Huang notes. “We equip them with the skills for self-directed learning.”

This discovery process is not limited to pupils, but extends to teachers as well. “Teachers should themselves be learners before they can guide the pupils,” notes Swee Huang. In a nutshell, *Découvrez* is about equipping teachers with the knowledge and skills in differentiation to meet the needs of their HP pupils.

But before teachers are able to cater to the needs of their HP pupils, they first need to be able to identify them. Therefore, the teachers are also introduced to the characteristics of high-ability learners.

The importance of teacher learning to support pupil learning was what sparked Mayflower to come up with a platform for these teachers to share with and learn from each other.

At the heart of this teacher learning process is an active committee known as the “HP committee”. It comprises like-minded teachers who are dedicated to engage HP pupils during lessons and maximize their potential.

The Culture of Sharing

Teachers need not feel alone when dealing with HP pupils as they now have the opportunity to learn from one another. During professional learning team-sharing sessions, teachers, new or experienced, are encouraged to share their success and challenges.

“We want the sharing of knowledge,” Swee Huang says. From the sharing sessions, she also feels that teachers now have the opportunity to give opinion and feedback regarding teaching methods in a professional environment.

In the spirit of sharing, the teachers also started compiling training notes and their own lesson plans that they have found useful. These are shared with all teachers so as to grow the pool of resources and ideas from which new ones can be added on to.

“This is a resource file which teachers can use according to their needs,” says Swee Huang, who believes that teachers themselves must be continually learning in order to groom such learners.

In this resource file is a tool called the unit modification planner. Fondly known as the “UMP” to Mayflower teachers, the planner is a thinking tool that helps teachers to differentiate in terms of learning outcomes for their HP pupils.

This is a working file that teachers can continually add resources to. As they grow in their knowledge of teaching HP pupils, the pool of resources also expands. “This is not about chalk and talk,” notes Swee Huang. “This is to build and grow the knowledge.”

Jessie also adds that from her experience with the HP committee, such lesson planning has different demands and may be a challenge for beginners. “There might be a lot of uncertainties to plan such a lesson but to get started is the way to go,” she advises.



Swee Huang and Jessie are always exploring ways to help their pupils

Teachers should themselves be learners before they can guide the pupils.

- Swee Huang on the importance of teacher learning