Differentiated teaching in higher education

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Students are a very **heterogeneous group** – not only in terms of age, socioeconomic status, ethnic and cultural background, sexual preference, and so on, but also in terms of prior knowledge, interests and study methods. Their inherent diversity encompasses much more than just ethnic or cultural differences. Therefore, the complexity of society cannot and should not be considered as separate from the educational context. Diversity is the **norm** and has an important added value: being aware of and immersed in diversity prepares students to function in a constantly changing society. The challenge is to **recognise and leverage this diversity in our education**, and to address it through differentiated teaching, so that all students have sufficient opportunities to develop their talents.

In this teaching tip, we will first look at the **concept** of differentiation. Then we will highlight the **importance** of differentiated teaching in education. Next, we will explain some **strategies** for handling differences between students during and/or outside lessons. To wrap things up, we will offer a **conclusion** that brings together the most important insights of this teaching tip.

Differentiation: what it is, and what it is not

Tomlinson (2017), a pioneer in the description, analysis and professionalisation of differentiation, defines differentiation as 'proactive teaching to meet the different needs so that the learning opportunities of all students are maximised'. **Proactive teaching** means adapting and tailoring curricula, instruction strategies, learning materials, learning activities and learning outcomes to the student audience. Differentiation is not the same as **personalised education**, as it does not imply a different approach to each student. Differentiation emphasises meaningful activities for **all students**, and not only for students with specific learning needs (see Anthonissen et al., 2015).

Differentiation, when seen as a collection of all measures taken to deal with differences between students, is a **mindset** or a professional attitude, rather than merely a method or a recipe (see Castelein et al., 2016). This mindset implies that lecturers believe that learning achievements are not merely the result of qualities, talents or intelligence, but that any student who puts in the work can be successful (see Coubergs et al., 2017), but without going so far as to set different end goals for certain students. The important thing is that the journey towards these end goals is also appreciated, and not only the final result.

In addition to this 'growth mindset', having **high expectations** of all students is also important. Differentiation does not mean lowering the bar; it means providing tools or intermediate steps so that all students can reach and possibly even exceed the bar (see Castelein et al., 2016).

Differentiation: relevance in higher education

Differentiation is **essential**, also in higher education. Tomlinson (2017) shows that differentiation is a logical consequence of the immutable fact that all students are 'diverse'. For students to be able to learn, lecturers must provide both **challenges and successes**. This can only be done if the differences between students are not ignored, and by using a flexible educational approach.

Differentiation is conducive to students' **learning performance and learning efficiency**. It also increases the students' – and therefore also the lecturer's – **motivation** and **well-being**. By paying specific attention to differences between students, and by considering these differences as assets that can provide added value (e.g. they allow for the creation of heterogeneous groups), all students get a fair chance to develop and ultimately achieve the predefined competences (see Castelein et al., 2016). Want to learn how you can create heterogeneous groups? Check out this 2019 ECHO Tip (in Dutch).

Differentiation: how?

Differentiation can take on a variety of forms, ranging **from small adjustments in teaching practices to very time-consuming changes** that also have effects at the study programme level (for more inspiration, check out this ECHO Session on dealing with student differences, in Dutch).

There are many student characteristics that lecturers have no control over. However, there are a number of factors, such as the **learning status** (i.e. prior knowledge and attitudes towards learning), **interests and the learning profile** (i.e. how students learn), that lecturers can influence, and where they can really make a difference.

We will first discuss two strategies that can be applied before or at the start of a series of classes: (1) pre-assessment and (2) pre-teaching. Then we will move on to five strategies that can be used both during and outside classes: (3) individual tasks, (4) peer-assisted learning, (5) the flipped classroom, (6) offering freedom of choice, and (7) formative assessment.

- *(1) Pre-assessment*

To address and leverage the differences between students, these differences first have to be **acknowledged and accepted**. This may seem obvious, but it is not (Anthonissen et al., 2015). Several researchers (see Castelein, 2016; Coubergs et al., 2013; Struyven et al., 2015) state that having an understanding of student characteristics from the start of the programme is crucial. In the phase we call 'pre-assessment', the lecturer **assesses the initial situation** of the students. In the case of a small student group, this can simply be done through a conversation, which is also a way for the lecturer to show interest. For larger student groups, it may be more practical to use a form or questionnaire to inquire about a number of aspects.

*Castelein and colleagues (2016) developed a **screening tool** that enquires about differences between students in six different domains: prior knowledge, (meta)cognitive skills, background, interests, learning preferences and affective skills (see here, p. 21-24, in Dutch). Students are encouraged to reflect on their own learning. The results of the survey are a source of inspiration for the further development of a programme component. The answers can also provide a starting point for discussions with students.*

*Another example is **LEMO**, a questionnaire on learning competences and motivation among students, developed by AP University of Applied Sciences and Arts and Edubron (UAntwerp). In addition to a self-reporting questionnaire, the tool contains an individual and a group feedback report. These feedback reports are aimed at further development; they provide guidelines to develop high-quality and successful learning. More information on the LEMO tool, manuals and refresher courses can be found here (in Dutch).*

*Within the **Academic Teacher Training Programme at UAntwerp (ALUA),** in **English teaching methodology**, pre-assessment is used to get to know students so that heterogeneous groups can be created: sometimes, students who already have some teaching experience can be put together to brainstorm about something, while other times they can be spread out so that every group has at least one student with prior teaching experience. Here are some examples of questions in this pre-assessment phase:*

- *Besides English, I am also taking ... teaching methodology.*

- *Besides my university studies, I am professionally/personally involved in ...*
- *My bachelor programme is ...*
- *My experience as a teacher is ...*
- *My motivation to follow teacher training is ...*
- *My expectations of these courses in English teaching methodology are ...*
- *My interests, when it comes to foreign language teaching, are ...*
- *In my opinion, a 'good teacher' is ...*

- *(2) Pre-teaching*

When it is determined at the start of a programme component that certain students are experiencing **difficulties** that are hard to solve on their own, or when a pre-assessment reveals certain shortcomings in prior knowledge, it may be useful to include a pre-teaching phase. Pre-teaching is a way to **proactively address differences between students**, in this case mainly in learning status. Pre-teaching does not take place during the classes, and is intended to prepare students for the learning content that will be covered **before formal classes begin**. Pre-teaching mainly consists of short instructional lessons covering a number of basic rules. This way, learning content is refreshed and students can get a better idea of what exactly is expected in terms of prior knowledge (Struyven et al., 2015). Pre-teaching has the advantage that it can be organised relatively easily, even from home (e.g. through self-study packs). When pre-teaching is used as a differentiation strategy, students are able to catch up more quickly **during the classes** and do not fall behind as much. This allows the pace of the classes to be increased, which also benefits stronger students (Castelein et al., 2016).

- *(3) Individual tasks*

There will always be differences between students, even after pre-teaching (Coubergs et al., 2013). Working with individual learning tasks can help to overcome these differences, primarily in learning status. To address differences effectively, working with **Basic, Revision and In-depth** groups (the 'BRI model') may prove useful. All students have to grasp the basic subject matter. Subject matter revision is aimed at students who experience certain difficulties, while in-depth subject matter is for students who can handle additional challenges (Castelein et al., 2016; Coubergs, 2013).

The BRI model usually has a fixed **structure** (Castelein et al., 2016):

I. First, based on the competences to be attained, the lecturer determines the **basic learning content**, to be processed and acquired by all students.

II. After the basic learning content is taught, students take a **formative test** to see how well they have mastered it. The results of this test can then be used to create **groups according to the learning status**.
More information on the 'what', 'why' and 'how' of formative assessment can be found in this ECHO tip (2017).

III. Students who show a sufficient grasp of the basic learning content can join the **in-depth group**, while the **revision group** is intended for students who have not yet fully mastered the basic material. These students revisit the basic material, but in a different way. It is important to introduce some variety here. In addition to the in-depth and revision groups, it could also be useful to create an **intermediate group** of students who do not readily fit into either of the other two groups. This group would then go over the learning content of the revision group at an accelerated pace, and also get some of the in-depth material. Students can work on the tasks over several classes or weeks.

IV. Afterwards, all groups are merged again and take a **summative test** of the basic learning content, to check whether all students have achieved the predetermined goals. If necessary, additional **remedial teaching** can be offered to students who still have an insufficient grasp of the basic learning content.

The BRI model has a number of **advantages**. It enables lecturers to tailor their teaching to subgroups of students. Tailor-made assignments not only help stimulate and motivate students, but can also strengthen their independence and self-reliance. The lecturer also has more opportunities to check the learning process of students and to intervene in a timely manner whenever necessary (see Castelein et al., 2016).

Of course, there are also some **caveats** to the BRI model. The most obvious one is that the lecturer will need to

provide more learning materials to meet the needs of the different groups. In addition, there is the risk of emphasising, or even exacerbating, the disparity between students by **categorising** them into groups. However, this risk is reduced as these are not fixed groups: their composition will tend to change throughout the year, depending on the learning content covered. After all, the majority of students do not master every part of a programme component to the same extent. There is also a risk that the lecturer's **expectations** of students in the revision group will be lower. As a result, these students might miss out on certain learning opportunities offered to stronger students (Belfi et al., 2010).

Of course, differentiation can also be applied in **heterogeneous groups**, where students with different learning statuses actually work together instead of being split up into separate groups. More on this can be found in the next section on peer-assisted learning.

- *(4) Peer-assisted learning*

Fellow students ('peers') can also be used in differentiation strategies. In the literature, this is referred to as 'peer-assisted learning' or 'PAL' (see Castelein et al., 2016). There is a lot of variation in the terminology regarding the role of students as 'peers' in the formal curriculum. The interpretation can also be very different. We will be using the broad term 'peer-assisted learning' as it was described by Topping and Ehly (1998): 'people from similar social groupings, who are not professional teachers, helping each other to learn and by so doing, learning themselves'. The bottom line is that **tutors and tutees** are appointed to support each other in learning. The peers who are called upon to help other, often weaker, students, are not necessarily the strongest students. It is important to strike a **good balance** between students who help and students who are helped (Castelein et al., 2016).

When students are mixed and paired up based on different learning statuses, interests and/or learning profiles, **heterogeneous groups** are formed.

Heterogeneous grouping in that way has a number of **advantages.** Heterogeneous groups are instructive for strong students, because they will actively think about ways to convey the learning content to their tutees. For tutees, heterogeneous groups create opportunities to work their way up by observing the model behaviour of their tutors. Weaker students perform better in heterogeneous groups, while average and stronger students tend to perform better in homogeneous groups (Kang, Park, & Lee, 2007). A possible **disadvantage** of heterogeneous grouping is that weaker students may have fewer opportunities to take the lead – and therefore to develop leadership qualities – than stronger students, who are encouraged to take the lead as tutors (Castelein et al., 2016). It is especially important that there is flexibility in the composition of groups, with the lecturer **alternating between homogeneous and heterogeneous groups.** This allows for various learning objectives to be pursued, while mitigating the potentially detrimental effects of any one grouping type (Struyven et al., 2015). For more info on grouping methods, see the ECHO Tip on creating heterogeneous groups (2019) (in Dutch) and the ECHO Tip on dividing students for work groups (2018).

PAL is often applied in the form of projects organised **outside the formal curriculum** of a programme or programme component. Think, for example, of tutoring projects where students volunteer to help each other process difficult learning content. However, PAL can also take place **in class**, in which case the exchange between peers is part of the teaching and learning activities of the programme component. In this scenario, students can even alternate between being the tutor and the tutee. The lecturer mainly acts as a process facilitator here, providing face-to-face guidance – either at set times, or at the request of students – or remote guidance, for example via email or an online discussion forum.

> *At the **University of Antwerp** (Computer Science, 1st and 2nd bachelor years), PAL is used to encourage students to collaborate and learn from one another. In this context, PAL is used for formative assessment via a role-play (coach and expert) with clear instructions. Students are asked to explain a certain part of the subject matter to their fellow students, which creates different learning opportunities. This way of working can be applied in both face-to-face and online settings.*
>
> *Are you a UAntwerp member of staff? Then you can consult this good practice on the Pintra page of the Faculty of Science (in Dutch), which offers some more insight into the way of working and the practical arrangements. Please note: If you have not visited this page before, please log in here first and then go to 'education' > 'blended learning' > 'tips & tricks' > 'PAL-clips als krachtig feedback-instrument'.*

It is up to the lecturer to decide how to assess PAL and whether the students have achieved the intended objectives. One way of doing this is by using **peer**

feedback and/or peer assessment. More on this can be found in the ECHO Tip on peer assessment (2017).

- *(5) Flipped classroom*

The 'flipped classroom' is a much talked-about way of dealing with differences between students. This strategy is characterised by the time that is allotted for students to acquire, analyse and assess knowledge by themselves, by means of (technology-assisted) preparation at home (Bischop & Verleger, 2013). The lecturer provides learning materials for students to **process independently** prior to a lesson. These can be knowledge clips – see this ECHO Tip (in Dutch) – but also scientific articles, excerpts from a book, newspaper articles, a story, and so on. This means that classroom contact time is partly replaced by online or offline study materials that students study by themselves, so that during lessons, there is more time to answer individual or group questions, to focus on certain learning content, to provide more personal support, and so on (Struyven et al., 2015). The flipped classroom as a differentiation strategy is especially useful for students with a different **learning status** and/or a different **work pace**. It provides opportunities to optimise the contact time with students and to pursue higher processing levels.

Want to know more about the flipped classroom? Check out this 2019 ECHO tip.

*In the **second bachelor year of Business Engineering at the University of Antwerp** (+/- 120 students), the flipped classroom is used as a teaching method for several reasons. It serves as a way to **activate** students in their thinking towards creative solutions in the fields of economics, mathematics and technology. It allows students to find their way **independently**, while providing them with the necessary **support**. The **learning efficiency** increases as students can work at their own pace. The differences between students are acknowledged, because the syllabus and the lessons include both basic questions and more challenging questions for students who need more in-depth knowledge. Students who experience difficulties can **ask questions** during class. When this teaching method is used, lecturers find that student **involvement** is higher than in conventional teaching.*

*During the **first class**, the lecturer explains the teaching approach. **Classes** are then scheduled **every two weeks** where the lecturer and assistants are available to answer the students' questions. Students can also submit their assignments in advance for personal feedback. **In preparation for the classes**, students read a chapter and watch a video. The videos are intended primarily for students who have some difficulty studying the materials as they are presented in the syllabus (theory + exercises). During the classes, students work **in pairs**. They work their way through the syllabus, which includes assignments, at their own pace. They solve the exercises with a teammate. When they enter the classroom, students are randomly assigned to a peer by drawing a card.*

*The competences of students are **assessed** through formative and summative assessment; there is a series of short digital tests with open-ended questions after each class (formative) and there are two assessment moments at the end of each semester, during which an extensive digital test is taken via Blackboard (summative).*

- *(6) Offering freedom of choice*

By offering the students freedom of choice, differentiation in the **learning product** can be ensured (i.e. the way students demonstrate the extent to which they have achieved the competences). This allows for a **better match with the interests** of students, which fuels their **motivation** (Tomlinson, 2014). For example, students, individually or in groups, can be given freedom of choice in how they present their assignments: by making a PowerPoint presentation, a video, a poster, etc.

This differentiation approach can be taken even further by giving students the opportunity to **suggest the options to choose from**. It is then up to the lecturer to assess the viability of the suggested options. Regardless of the extent of the freedom of choice given to students, it is important to **be clear about the assessment criteria**. Students need to know what is expected of them by means of specific objectives with a clear link to the desired results (Tomlinson, 2017). When different end products are possible, it makes sense to work with **generic criteria** that apply to all types of end products. In addition, variable, **more specific criteria** can be added to take the product-specific aspects of the students' creations into account.

- *(7) Formative assessment*

Formative assessment is a form of assessment that **monitors student learning**. It identifies each student's **strengths and weaknesses** and provides insights to adjust teaching and learning activities along the way. Research

clearly shows that it is important to use formative assessment, not only to help the students achieve the predefined competences, but also to help lecturers **ensure the quality of their education** (e.g. Hattie & Timperley, 2007; van Diggelen et al., 2016).

There are different ways of formative assessment, which can be **informal** or **formal**. Walking around the classroom, asking questions during the lecture, launching a poll, or gauging prior knowledge at the start of a lecture: these are all examples of informal formative assessment. Organising a mock exam, scheduling interim (optional) tests, and giving interim feedback on assignments are examples of formal formative assessment. The **electronic learning environment and digital educational applications** offer many opportunities to facilitate formative assessment.

Poll Everywhere *is an example of a free educational application that facilitates formative assessment. This can be done using multiple-choice questions, a poll, open-ended questions, questions where students have to indicate how they would assess their own progress, etc. If you use PowerPoint during your lectures, you can also integrate formative assessment into your slides. Tutorials on Poll Everywhere can be found here.*

Another example of an educational application is ***Formative****. This tool is similar to Poll Everywhere, but it also allows students to draw freely with the 'show your work' option. This can be helpful when developing step-by-step exercises, for instance. More info about the features of Formative can be found here.*

For students to learn from formative assessment, **feedback is crucial** (Struyven et al., 2015). Useful feedback not only gives students insight into where they stand at a given moment ('feed back'), but it also says something about the level they need to attain ('feed up') and how they can attain it ('feed forward'). Want to know more about what effective feedback looks like? Check out these ECHO Tips (in Dutch).

In the event that certain difficulties arise, it is important to provide **remedial teaching** in time. This can be done by providing extra instruction, e.g. in the form of a Q&A session, additional exercises, a self-study pack, or PAL (as discussed earlier). Conversely, strong students must also be given the opportunity to explore the basic subject matter in more detail.

Conclusion

Differentiation is not at all new, and certainly not just some new fad in education. It is an integral part of good education. The 'one-size-fits-all approach' has long since given way to an educational approach that pays more attention to a wide range of learning needs. However, differentiation does not at all imply taking an individual approach to every student. It is about providing sufficient learning opportunities for all students. It is up to every lecturer to find their own way in this, one that fits in with their teaching style, tailored to the group of students in front of them. Differentiation also includes small initiatives that might seem insignificant, but that can have a big impact on student learning. The students should always retain ownership of their own learning, and it is ultimately up to them to seize the opportunities offered by their lecturers with both hands. That is how differentiation can be a real success!

Want to know more?

Literature

Anthonissen, L., Goosen, K., Lenaerts, S., Schittecat, P-J., Smits, T., & Tanghe, E. (2015). Binnenklasdifferentiatie in het curriculum van de lerarenopleiding: hardnekkige misvattingen wegwerken. *Tijdschrift voor Lerarenopleiders, 36*(3), 17-28. Retrieved on 9 August 2021 from http://www.lerarenopleider.nl/velon/ledensite/files/2015/09/36_3_2Anthonissen_etal.pdf

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van Diggelen, M.R., Morgan, C.M., Funk, M., & Alonson, M.B. (2016). *Formative assessment: enriching teaching and learning with formative assessment.* Retrieved on 9 August 2021 from https://bit.ly/2PrMO8A

Sources of inspiration (in English)

- Formative assessment in education, a toolbox on formative assessment developed by Karel de Grote Hogeschool and UAntwerp (also available in Dutch). You will find inspiration on how to make learning visible, how to adjust learning and how to ensure a safe and stimulating learning climate.

Sources of inspiration (in Dutch)

- Inspiration page of BV Database on differentiation
- Blog of Odisee Co-Hogeschool about differentiation in higher education
- Background information on peer-assisted learning (PAL)
- Pre-assessment screening tool by Castelein et al., 2016 (see p. 21 and 22)
- Want to learn how to get started with PAL step by step? Check out the Dutch manual here (Educational Development and Internationalisation Service of Artevelde University of Applied Sciences (2014)). In five steps it explains how to develop PAL, how to identify tutees and tutors, and how PAL can be assessed. Even when you do not want to use the roles of tutor and tutee, for instance because there are little to no discernible differences in the students' initial competences,

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PAL can still be used. You can read more about this in the above-mentioned manual under 'Dyade-onderwijs'.

Centre of Expertise for Higher Education (ECHO)

- Teaching Tips (in English)
  - Formative testing (2017)
  - Dividing students for group work (2018)
  - Peer assessment (2017)
  - Flipped classroom (2019)
- Teaching Tips (in Dutch)
  - Themapagina 'feedback'
  - Themapagina 'diversiteit'
  - Heterogene groepen samenstellen (2019)
- Sessions (in Dutch)
  - Binnenklasdifferentiatie: omgaan met verschillen tussen studenten (Tom Smits & Wouter Schelfhout, 2016)

Sources accessible only to UAntwerp staff

- Good Practices, Education Info Centre
  - Blended leren: flipped classroom design voor een praktijkgericht opleidingsonderdeel in de 1e bachelor
  - Flipped classroom-model toegepast
  - Flipped-classroom door middel van kennisclips voor biostatistiek
  - Elektronisch stemmen, screencasts maken en digitaal toetsen bij Fysica
  - Online voorbereidingspakket Biostatistics
  - Studenten zelf vragen laten opstellen voor een sterker engagement

- Pintra-pagina 'Teaching on campus & online': motivating & differentiating