2022

TEACH & LEARN

THE UP WAY

	Students should:		Lecturers will:
1	**PREPARE** Consult the study guide & clickUP: prepare and complete the assessments	BEFORE CLASS	**Provide activities & assess** Textbooks & clickUP: pdfs, videos, ...
2	**ENGAGE** Ask questions and take part in the discussions	DURING SCHEDULED CLASS TIME	**Discuss difficult concepts** Answer questions
3	**CONSOLIDATE**	AFTER CLASS	**Let students** Revise & apply

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
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THE UP WAY

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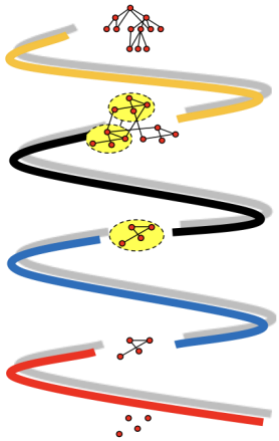
Introduction

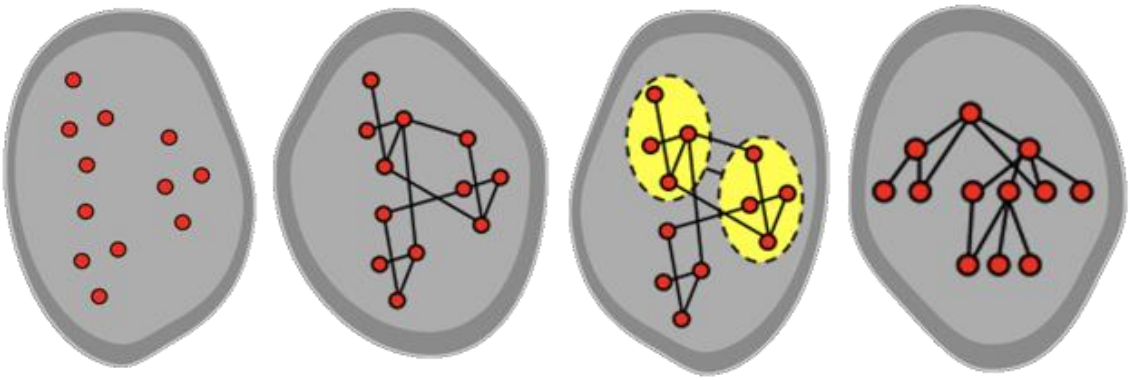
A teaching and learning model needs to take into consideration the demands of the workplace, research on effective teaching and learning, the nature and needs of our current students, technological and pedagogical innovations, and the current reality and facilities of the University. We need research-informed, evidence-based teaching and learning practices.

Conceptual development: How do students learn?

The most fundamental question is how students learn, and what we know about effective pedagogical approaches and instructional methods. Conceptual development has been discussed, analysed, and researched for more than 2 000 years by philosophers, educationists, psychologists, and, more recently, neuroscientists. A discussion about learning or acquisition of knowledge always revolves around views on the nature of knowledge. The generally accepted learning theory in education is constructivism, which suggests that all knowledge is constructed from previous knowledge rather than just passively memorised. According to Piaget (Block, 1982) this construction process consists of assimilation-accommodation processes. Neuroimaging research suggests that the information from the senses is turned into knowledge in the hippocampus in the brain. Willis (2021) explains that "[t]his encoding process requires activation or prior knowledge with a similar 'pattern' to physically link with the new input if a short-term memory is to be constructed". The link between understanding and connections has also been confirmed by neuroscientists: "The consensus among neuroscientists is that the basis of learning and memory creation lies in changes in electrically active nerve cells, called neurons, and the connections between them, the synapses" (Owens & Tanner, 2017, p. 2).



The way in which a conceptual structure is developed determines the quality and usability of people's knowledge. In 1906, Baldwin identified four conceptual development phases: sensorimotor, quasi-logical, logical, and hyper-logical. The first phase of conceptual development, according to Piaget, is the pre-structural phase, during which children memorise but do not connect ideas logically. If ideas are memorised without rigorous reflective reasoning, they are almost worthless.



Students must see a discipline as a connected web of concepts. They must understand and be able to explain the link between related concepts and procedures. This is not a new idea: Aristotle explained in 300 BC that the 'mind' has to tie the system together. In 1933, Dewey explained that after representing the 'new' ideas and comparing these with the 'existing' ideas, the mind reorganises and connects the ideas to reach a conclusion. However, if a student's conceptual structure is not well-organised and structured around big ideas, it becomes almost impossible to use them for problem-solving and the generation of new ideas. Studies on experts' knowledge show that their "knowledge is not simply a list of facts and formulas that are relevant to their

domain; instead, their knowledge is organised around core concepts or 'big ideas' that guide their thinking about their domains" (Bransford et al, 1999, p. 36). A more organised knowledge structure around big ideas enables students to apply their knowledge, solve problems, and create new knowledge. Summative assessment at the end of a chapter, section, or course should provide students with an opportunity to integrate and consolidate their knowledge around big ideas.

According to a 2021 McKinsey report, critical thinking is an essential cognitive skill that students will need in the future world of work. Critical thinking requires logical reasoning and a well-organised knowledge structure. A hierarchical conceptual schema allows people to think critically, that is to consider alternatives, understand biases, and identify the strengths and weaknesses in arguments and proofs. A critical aim of the learning process is to enable and develop critical thinking by supporting students in the building of powerful and economical hierarchical knowledge structures. The result of deductive reasoning is a powerful and economical hierarchical structure or conceptual schema based on a set of premises. The identification of premises is the basic building block of critical thinking because it allows students to consider alternative hierarchical structures based on other alternative premises. Kuhn (2001, p. 5) identified three broad levels of 'justification' development, namely absolutist, multiplist, and evaluativist: "At the absolutist level, the products of knowing are facts that are objective, are certain, and derive from an external reality that they depict. This absolutist conception is most likely to undergo radical revolution during adolescence, to be replaced by a multiplist (sometimes called relativist) conception of knowledge as opinions, freely chosen by their holders as personal possessions and accordingly not open to challenge. Only at the most advanced, evaluativist level is knowledge seen to consist of claims, which require support in a framework of alternatives, evidence, and argument." A hierarchical conceptual schema allows us to consider alternative hierarchical structures based on other premises.

Pedagogical approach: Creating effective learning environments

Effective student learning requires a learning environment in which students actively participate to take control of (monitor and regulate) their learning. According to Wills (2021), neuroimaging research reveals that "[t]here are conditions associated with the most successful strengthening of neural networks, such as guided instruction and practice with frequent corrective feedback". She also emphasises the importance of reflection. As discussed, the reflective thinking process starts with a dilemma, problem, or, as described by Dewey (1933, p. 14), "a forked-road situation… [which] disturbed his equilibrium." Dewey (1933, p. 12) explains that "Reflective thinking […] involves (1) a state of doubt, hesitation, perplexity, mental difficulty, in which thinking originates, and (2) an act of searching, hunting, inquiring, to find material that will resolve the doubt, settle and dispose of the perplexity."

Inquiry-based teaching (i.e., teaching by questioning, not by telling) starts with a question that poses a mental difficulty. This is one of the oldest, yet most powerful, teaching methods utilised to foster reasoning skills. Socrates (470-399 BC) was a renowned Greek teacher who believed in teaching by questioning, not by telling. Inquiry-based learning is an approach in which teachers are encouraged to ask questions and encourage students to share ideas. This Socratic method stimulates reasoning skills and creates an environment which encourages the scrutinising of ideas to determine the underlying assumptions and premises. In such a teaching environment, students are under pressure to reason, explain, and justify their thinking. According to Piaget (1928, p. 137), the value of this is that "[o]nly under the pressure of argument and opposition will he seek to justify himself in the eyes of others and thus acquire the habit of watching himself think." Inquiry-based teaching encourages students to construct personal understanding and develop a critical attitude towards knowledge. Research shows that inquiry-based learning motivates students, stimulates critical thinking, and creates opportunities to develop a deeper understanding of concepts. In terms of preparing students for the fourth industrial revolution (4IR), inquiry-based learning has the potential to improve students' critical thinking, problem-solving skills, creativity, teamwork, intercultural communication, and collaboration.

Instructional method

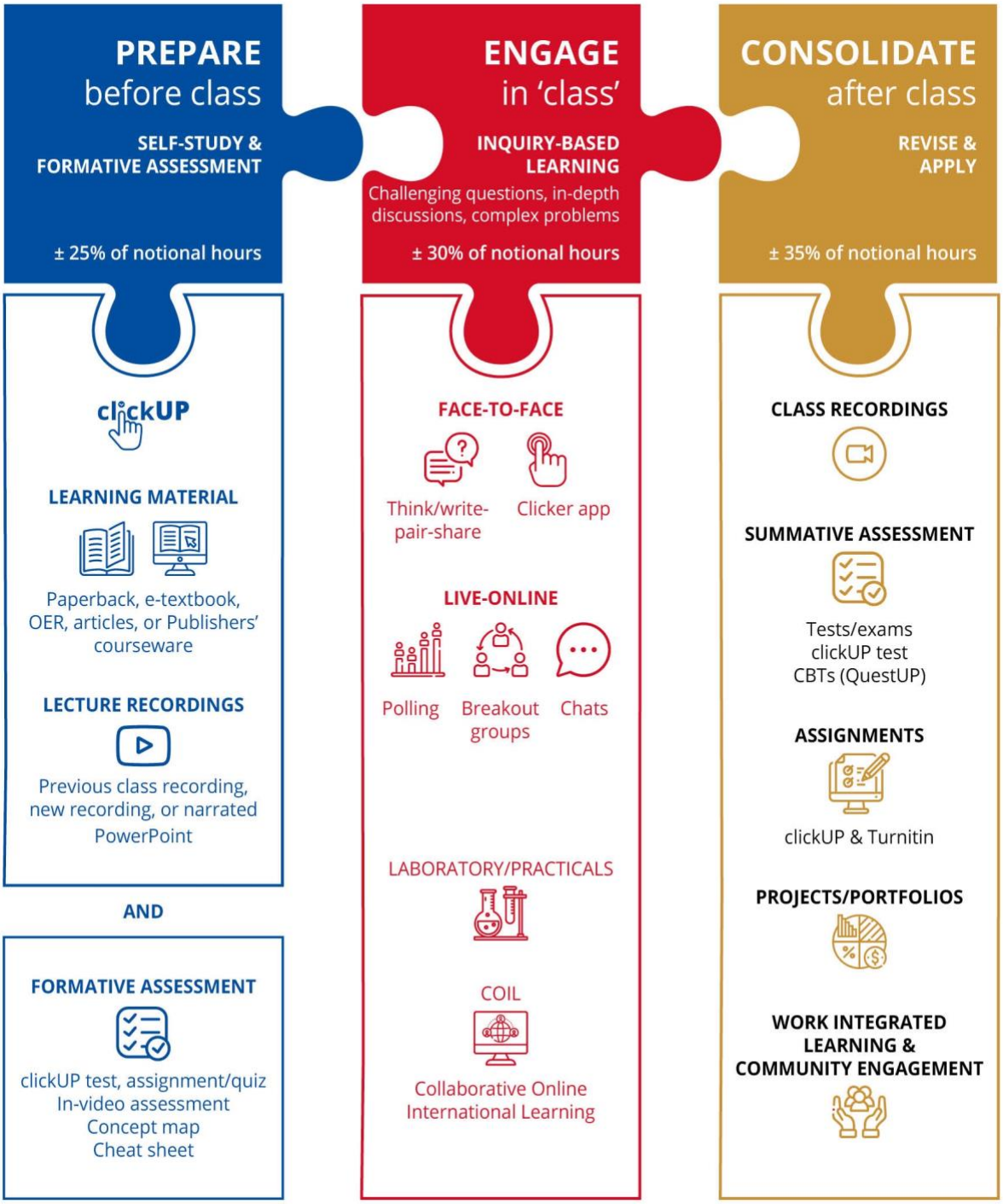
The University of Pretoria's (UP) teaching and learning model shifts the instructional sequence by assuming three phases in teaching and learning, namely (a) preparation before class, (b) engagement in class, and (c) consolidation after class. This teaching model places UP in the perfect position to develop the skills that students need to function effectively for the 4IR, as it encourages students to prepare independently for each class, but also to engage and critically discuss issues in class. Studies on the 4IR identify the following skills and values as essential: adaptability, career navigation, self-directed learning, lifelong learning, the ability to solve complex problems by taking a multi-disciplinary approach, critical thinking, innovation (creativity), teamwork (collaboration), environmental awareness, a productive work ethic, ethical reasoning, intercultural awareness, and digital fluency. As illustrated in Figure 1, the hybrid approach has the potential to extend the classroom experience beyond the lecture period—before and after class.

Table 1: Content presentation shift

	Before class	In class	After class
Traditional		**Information**: Lecture, overhead slides	**Homework:** Simple to complex activities
UP's hybrid model	**Information**: Video, textbook, other. **Formative assessment: Simple** homework activities	**Engagement:** Complex homework questions and discussions	

The UP teaching and learning model not only addresses the 4IR skills and optimal usage of the latest technology but is also conducive to a deeper understanding of the characteristics and learning needs of our students. This generation of students works best by being made aware of pre-class work like videos, reading and research. Although the new generation of students seeks information independently and on-demand, they want human interaction and opportunities to discuss their views and concerns.

Please visit the **Department for Education Innovation's (EI)** website for more information, training opportunities and support information. A team of dedicated instructional designers and educational consultants is also available to support you.



clickUP & Blackboard Mobile:
The University is currently using a Blackboard Learn learning management system (LMS), Blackboard Mobile, and Blackboard Collaborate technologies to support this hybrid learning. The online LMS (Blackboard) that UP uses is branded as clickUP.

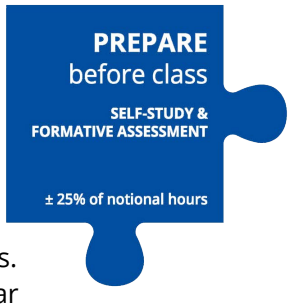
Blackboard Mobile enables students to access their learning material across various devices. Please ensure that your clickUP modules are available to your students and up-to-date.

How do I get access to a clickUP course?

- NAS Faculty: contact the assigned person in your department.
- Other faculties: Request access by emailing the module code and your clickUP username in this format: abc123_s1_2015,u01234567 to e-support.up.ac.za

For training and support: Book a training session, go to the Bb Quick Start Guide, visit the Support Site, or contact your Instructional Designer.

Stage 1: PREPARE before class



Quality instruction requires students to come to class prepared, as this enables new teaching to build actively on existing knowledge. Students should be encouraged to come to class prepared by providing detailed information on how to prepare for each session. At the very least, the study guide and the clickUP module should stipulate a clear, weekly work schedule so that students can keep up independently. Students can prepare for the class using traditional textbooks, e-textbooks, PDF and MS-Word files, videos, or publishers' learning systems. Students could watch a class recording (in tandem with a textbook) with a clear explanation of certain concepts, processes and procedures. In this case, the recording (a previous class recording or new recording) of the lecture should be available at least three days before the scheduled class time. Lecturers do not have to prescribe publishers' textbooks. Where possible, students should be provided with free open educational resources (OERs).

Textbooks & open educational resources (OER): Please see the University's Guidelines for Prescribed Materials. One of the most important and basic requirements for student success is to ensure that all students have access to essential course materials. OpenStax and the free OpenStax app provide high-quality open-source courseware at no cost.

VitalSource e-books: The University uses the VitalSource Bookshelf platform to give students instant access to e-textbooks on any device—both online and offline. These e-textbooks integrate into clickUP (Blackboard) and allow for the tracking of students' interactions with the textbooks, including the gathering of user information and student engagement.

Personalised adaptive learning systems: Artificial intelligence (AI)-driven adaptive learning systems create a personalised learning experience by adapting the content according to students' individual learning needs based on data from their responses to questions, tasks and experiences. Publishers are at the forefront and have developed adaptive learning environments, e.g. Connect (McGraw-Hill), MindTap (Cengage), MyLab (Pearson).

In-video assessment (H5P software): A lecturer can embed interactive quizzes into videos and track student results in Grade Centre. The tools are available in clickUP in any content area under Build Content, Interactive Videos and Tools (see step sheet). Although it is possible to produce videos, it is easier to search for an appropriate video from EdX, MITx, YouTube, Khan, or any other educational video site.

Blackboard assessment: Students can complete a clickUP assessment before class (textbook preparation).

Assessment before class:

Assessment is one of the ways we have of making students' learning visible. Therefore, assessment should always be linked to a specific learning outcome (or outcomes) as articulated in the study guide. The use of different relevant assessment approaches and strategies to assess the various learning outcomes during a particular course of study is always important. Formative assessment before class enables students to monitor their progress and permits a lecturer to understand where the students are and design instruction accordingly. Formative assessments could help both lecturers and their students to monitor their understanding, and can help students learn to take control of their learning and prepare them for lifelong learning. Students must be held accountable for class preparation, and their preparedness for each class should be assessed before the class.

Examples of 'tickets to enter' could include:[1]

- a completed assignment,
- a one-page 'cheat sheet' which they can use to solve a problem, or
- a mind map which they can use to write a class test.

Technology enables us to assess student preparedness in many powerful ways:

- clickUP tests, assignments, quiz tool, journals, wikis and more
- In-video assessment
- Turnitin assignment

Stage 2: ENGAGE in class

Inquiry-based learning enables students to think, communicate and justify their ideas. The information that was gathered as a result of activities before class should be used to formulate a few challenging questions/class assignments that could lead to in-depth discussion. Abla[2] suggests the following hints to spark student engagement: craft fewer (but more profound) questions, introduce controversy, mine the knowledge gap, ask the students why they should know this, and encourage dynamic collaboration. Research shows that inquiry-based learning motivates students, stimulates critical thinking, and creates opportunities to develop a deeper understanding of concepts.

Face-to-face contact class

Interaction in face-to-face lectures can be achieved in various ways. One possible way is to ask students to respond to a question (using the Clicker app in large classes). Thereafter, they should find peers with different answers and try to convince them of their position. Students can now be asked to respond again. At this point, the correct answer can be explained (by either the lecturer or students). When students explain the work to their peers, it enhances their own understanding and retention.[3] The use of a student response system (Clicker app) to capture responses will avoid choral responses. This will provide lecturers with data not only about class attendance and engagement but also about student understanding (formative assessment). The feedback from the system will also provide students with instant feedback about their understanding in an anonymous and non-threatening way.

Clicker mobile app (TurningPoint Mobile Clicker Solution): The TurningPoint Mobile App allows students to respond to multiple question types, such as multiple-choice, alphanumeric, multiple responses, and essay questions. Questions and answer choices are displayed on the web-enabled device while polling is open. To download the latest version of TurningPoint Instructional Software, go to TurningPoint v 8.7.3 for PC or TurningPoint v8.7.2 for MAC. Watch this video on how to enable mobile clickers using TurningPoint: http://bit.ly/2Plttpw.

Online virtual classes during scheduled class time

Depending on the circumstances, there are several ways to offer online virtual classes during scheduled class:

- Students could watch a class recording (in tandem with a textbook) with a clear explanation of certain concepts, processes and procedures. The recording (previous class recording or new recording) of the lecture should be available at least three days before

[1] https://www.facultyfocus.com/articles/blended-flipped-learning/ready-to-flip-three-ways-to-hold-students-accountable-for-pre-class-work/

[2] http://www.eaicy.eu/post/7-ways-spark-engagement/

[3] https://www.edutopia.org/article/why-students-forget-and-what-you-can-do-about-it?utm_source=facebook&utm_medium=socialflow

the scheduled class time. After watching the video, and before class, students should complete a short assessment (in-video assessment or clickUP test). This approach enables students to take more control of their own learning and monitor their own progress. Students could then make an informed decision about whether they need to attend the upcoming face-to-face class. Lecturers are also encouraged to use the clickUP Retention Center to identify at-risk students and require them to attend face-to-face classes. Access to a lecture recording may provide yet another asynchronous learning opportunity as an option; or

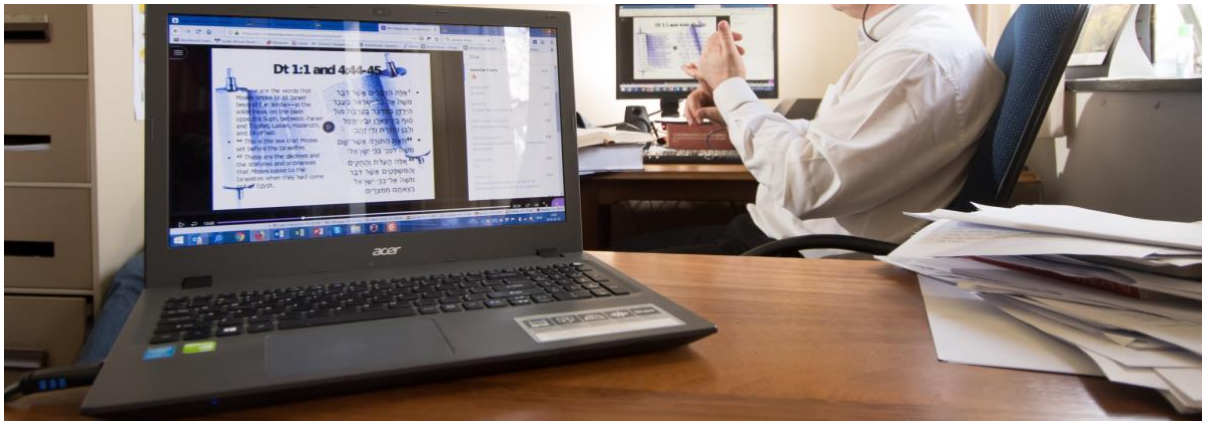
- Classes could be broadcast live via Bb Collaborate and recorded for later viewing. Here are AVer 340+ camera Guidelines and Video instructions on how to stream and record Bb Collaborate lectures.
- Lectures could be broadcast live to other students and recorded for later viewing. A small portable USB AVer 340+ camera (provided by the departments) could be used with any laptop (and Bb Collaborate) to enable the live-streaming of classes via Bb Collaborate.

Blackboard Collaborate is an online video platform that is integrated into clickUP. Students can use their Bb app or any browser on their cellphone to join a Collaborate session. Collaborate works well for up to 500 users online. For more information, go to the documents on the Help Site, How to set up Collaborate, or watch this video: https://youtu.be/NmzPr0mDO6g.

Broadcast and record live class using Bb Collaborate & AVer 340+ camera:
- How to broadcast live class using Bb Collaborate & AVer 340+ camera
- Upload videos to YouTube & add in-video quiz interactions (H5P)
- Class booking: How to limit Google Forms responses

Laboratory work and practicals can support learning by providing an opportunity for students to experiment practically, discover important concepts, and help them to develop team-working skills. They are an important part of learning in science, engineering and health sciences. Practical work also introduces students to discipline-related work-safety precautions and rules.

Collaborative Online International Learning (COIL): A lecturer could also embark on teaching and/or learning international collaboration with another university. This could include the sharing or co-developing of materials or resources (e.g. open educational resources), co-lecturing a topic or a theme, or students working collaboratively on a project/assignment. On a more formal level, this also includes joint modules or programme offerings as a combined qualification or part-qualification.



Stage 3: CONSOLIDATE after class

It is critical to create opportunities for students to reflect, integrate and restructure their knowledge. This could include the opportunity to prepare for summative assessment, working on an assignment, watching a class recording and reflecting on it, drawing a concept map, making a summary, working on a project, applying knowledge to solve an integrated complex problem, or watching the recording of the lecture again. An important part of the University's consolidation process is curricular-related work-integrated learning (WIL) and community engagement (CE) fieldwork, which sees students earn credits towards their degrees while applying their knowledge in the service of their community.

Class recordings: Classes could be recorded for later viewing via Bb Collaborate and the AVer 340+ camera (Guidelines and Video). For virtual classes, the process is easier. Blackboard Collaborate provides the opportunity to record virtual online sessions and to share recording links with students (see video: https://youtu.be/Qya2MrXNA1o). These videos could be made available to students on clickUP and used for remedial and revision purposes.

Assessment

A balance of formative and summative assessments over time, collected from multiple sources, provides a more authentic, reliable and valid picture of the student's learning. Formative assessment includes a "range of formal, non-formal and informal ongoing assessment procedures used to focus teaching and learning activities to improve student attainment" (SAQA, 2017: 26). Summative assessment is usually done at the end of a teaching period or instruction unit, and its purpose is to make a high-stakes judgement about a student's learning (SAQA, 2017:57). However, summative assessment involves more than traditional examination.

Assessment should aim to provide students with authentic learning and performance opportunities that are as close to real-life experiences as can be allowed within the scope of the programme or module, in line with the expected level of performance. Alternative authentic forms of assessment (suitable to gather evidence about students' achievement of a particular module's outcomes) should be carefully considered. Some competencies could be measured effectively using technology. This becomes even more important at a university that has large class sizes, as UP does. Whichever format the assessment takes, the problems posed must address the creative problem-solving skills students will need to thrive in the future.

Assignments and assessments after class provide further opportunities for students to consolidate their knowledge and organise it into meaningful hierarchical patterns. Clarity and transparency are critically important. It is therefore essential to provide students with a detailed assessment plan, clear task descriptions, and unambiguous assessment criteria for the judgement of performance (see the relevant sections in the Study Guide template).

Various tools and approaches can be used for assessment. Technology-enhanced and/or online assessment is just ONE of the many possibilities.

clickUP Tests: The objective questions are automatically graded to test students' knowledge:
- Guidelines to use clickUP tests for semester tests or examinations
- Roles, responsibilities and support with clickUP tests
- General support with tests
- Monitoring an exam while students write

Grade Centre
- Marking submissions

clickUP Assignments: The tool allows online submission of individual or group assignments (link for more information).

Turnitin assignments: Use Turnitin assignments to check for originality in submissions. It allows individual student assignments to be uploaded to clickUP and then compares the content with other students' assignments as well as web material (link for more information).

Cirrus Computer-Based Tests (CBTs), rebranded as QuestUP, create a secure environment for completing online tests. Computer-based testing is used extensively for both formative and summative assessment at the University of Pretoria as an integral part of the assessment strategies of many academic departments. The University uses the Cirrus Assessment, rebranded as QuestUP, within the institution.

Gradescope: Gradescope helps lecturers to administer and use AI to grade all assessments, whether online or in class. Gradescope's AI-assisted grading allows instructors to automatically group similar answers and grade all the answers in each group at once.

Proctorio: Proctorio integrates with clickUP tests and uses advanced machine learning and facial detection technology to deliver accurate, reliable exam proctoring.

Respondus Assessment solution: Respondus is a powerful tool for creating and managing exams that can be printed on paper or published directly to Blackboard. Exams can be created offline using Microsoft Word.

The use of appropriate alternative assessment tasks could also be considered. This may include take-home examinations, open-book essay-type questions and application questions, individual presentations, demonstrations, simulations, virtual branching assessment, creating artefacts, concept maps, infographics, recordings (dance, song, or poem), painting, drawing, sculpture, clinical scenario analyses, article discussions, journals, projects, or portfolios. It is important to make examinations and tests more meaningful to support the integration and restructuring of knowledge. Examinations should include higher cognitive integration, application, and authentic problem-solving questions. This will require us to remove unnecessary and unrealistic time limits. Also, consider open-book examinations and allow students to use 'cheat sheets' (summary notes).

A critical success factor for implementing this model is to adjust the weights of various assessments. To enhance student engagement in before-class and in-class assessments, more weight should be given to these assessments.

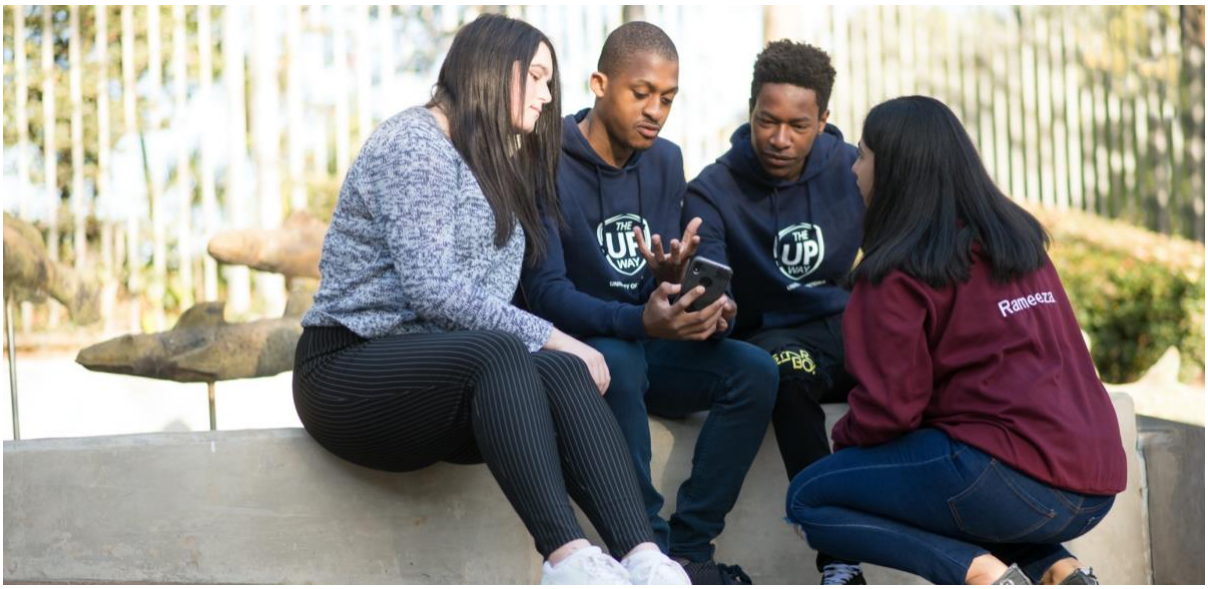
Project-based learning is another form of inquiry-based learning where students work together on a complicated inter-disciplinary problem—inside or outside the classroom, over a more extended period and in diverse groups—on a relevant topic (e.g. sustainability). In terms of preparing students for the 4IR, this has the potential to improve their teamwork abilities (human connection, social skills, and community), critical thinking, problem-solving, collaboration skills, intercultural awareness, and digital fluency.

Collaborative small-group work not only helps students to gain and consolidate their knowledge but also improves their social skills. It provides the opportunity to explain and refine their understanding by sharing their ideas and filling in each other's knowledge gaps.

Work-integrated learning (WIL):
The University understands work-integrated learning to be a method of learning that integrates theory with practices from the work environment within a purposefully designed curriculum. Work-integrated learning is a compulsory and essential component of some professional qualifications offered at UP and plays a fundamental role in contributing to the competencies that graduates need to develop to enter the work environment. WIL activities are aligned with curricular outcomes and are organised, planned, and monitored by the lecturer. The University does not have an institution-wide policy on WIL. It is part of the programme-accreditation requirements of bodies such as the Engineering Council of South Africa and the Health Professions Council of South Africa. It is thus communicated to students through their faculties. Sometimes a faculty, school or department might have a specific office that organises WIL; if not, the lecturer responsible for the relevant module will do so. The WIL component is organised and supervised as part of formal curricular activities. The Higher Education Qualifications Sub-Framework (2014) explains that "WIL may take various forms, including simulated learning, work-directed theoretical learning, problem-based learning, project-based learning, and workplace-based learning. The selection of appropriate forms of work-integrated learning depends on the nature and purpose of the qualification, programme objectives and outcomes, the NQF level at which the WIL component is pegged, institutional capacity to provide WIL opportunities, and the structures and systems that are in place within professional settings and sites of practice to support student learning. Where WIL is a structured part of a qualification, the volume of learning allocated to WIL should be appropriate to the purpose of the qualification and to the cognitive demands of the learning outcome and assessment criteria contained in the appropriate level descriptors."

Community engagement:
Given its unique base of knowledge and skills, the University of Pretoria is in an ideal position to apply that expertise to solving problems identified by communities. Most of the community engagement at the University is curricular—that is, students earn credits towards their degrees while applying their knowledge in the service of the community.

These community engagement opportunities provide an in-depth learning experience for students while specifically benefiting the communities in which they work. Such opportunities foster the development of skills for managing relationships, problem-solving and civic responsibility, offering a competitive edge for students entering the world of work.



Summary of UP's digital teaching and learning ecosystem

The University combines the latest technology to support its teaching and learning methodology and develop scalable, flexible, active and interactive learning environments.

Blackboard

eesysoft

Watermark Course Evaluations & Surveys watermark

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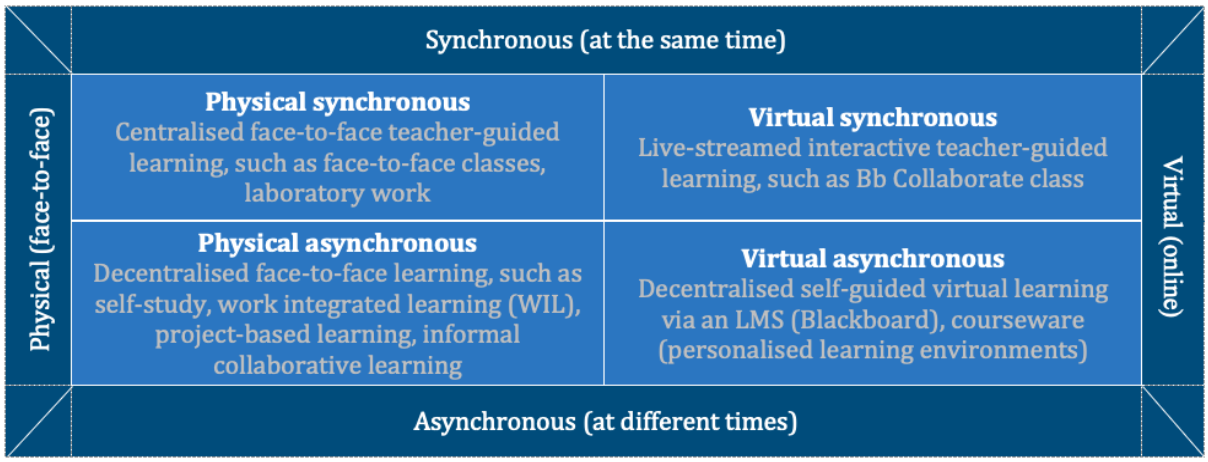
PREPARE	ENGAGE	CONSOLIDATE
Blackboard	Blackboard collaborate	Blackboard
VitalSource		cirrus
Pearson		gradescope
CENGAGE	TURNING technologies	turnitin
Mc Graw Hill connect		proctoric
WILEY macmillan learning		Respondus
openstax		
YouTube		
H5P		

Modes of teaching and learning

A useful framework to categorise and describe modes of learning is to use a time-space matrix (adapted from Bates, 2020). The time-space matrix defines four possible modes of learning: Students can learn online or offline, synchronously (at the same time) or asynchronously (at different times).



Each modality offers advantages and disadvantages. The optimal development of the undergraduate students for the world of work requires a combination of face-to-face, campus-based classes, and online activities. During the first two years of the COVID-19 pandemic (2020-21), we learnt some valuable lessons:

The positive impact of remote teaching	The negative impact of remote teaching
• Flexibility: study anytime, anywhere, at own pace • Time and cost-saving, e.g. travel and waiting time between classes • Independent, self-directed learning • More formative assessments • Class recordings (more than 70% of students watched the recordings) • Richer student data for analytics purposes, e.g. class and tutorial attendance, areas in which students engaged more in the clickUP module • Teaching virtually online • More experience in blended teaching and clickUP module design • Students' willingness to engage in Bb Collaborate online chats • Possibilities for small group discussions in large classes • Solved venue allocation issues • Advantages in marking online assessments	• Limited opportunity for lecturers to pick up non-verbal cues and adapt their teaching accordingly • Low levels of immediacy, which promotes cohesion and a sense of belonging • Compromised academic integrity, validity and quality of summative assessments • Limited formation of informal academic support networks • Difficulty in accessing and seeking assistance (no open doors to knock on or senior students to provide assistance) • Difficulty in providing enough opportunities to discuss, debate, network, or solve problems in class • Connectivity issues, data costs, and load shedding

A hybrid approach provides opportunities for lecturers to mix the best of contact, remote and online delivery to create a new learning environment for students. We want to maximise flexibility

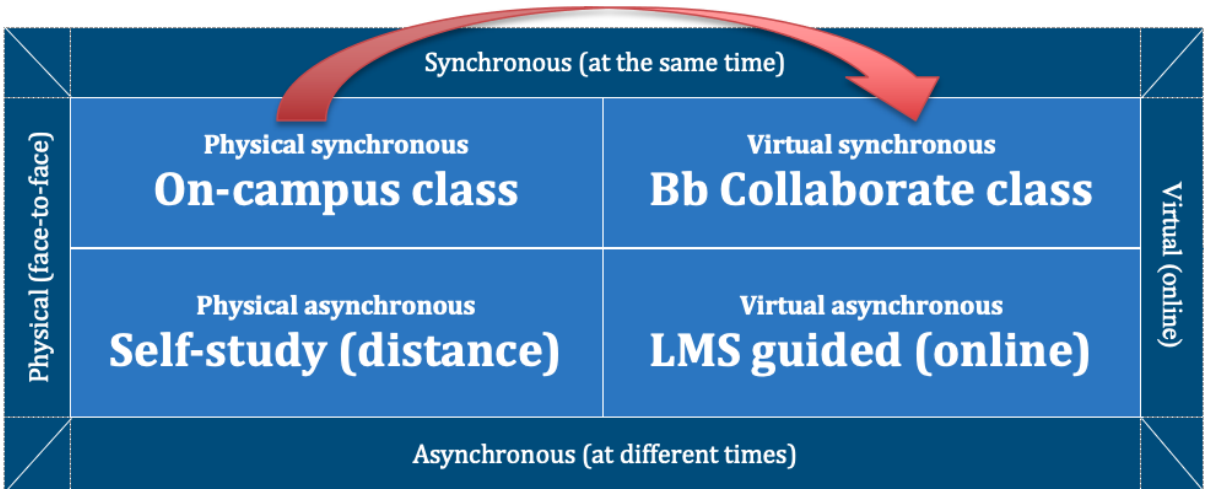
without compromising instructional quality, student success, accreditation, and funding. The preferred mode or combination of modes of teaching also depends on the disciplinary content, the students, and the pedagogical approach. However, UP's undergraduate courses are only accredited for full-time contact mode. Higher education institutions receive only half of the subsidy for undergraduate courses for distance education programmes. The Distance Education Policy of the Department of Higher Education and Training (2014) explains that "the term 'distance education' refers to a provision in which students spend 30% or any of the stated notional learning hours in undergraduate courses at NQF Levels 5 and 6, and 25% or less in courses at NQF Level 7 and initial postgraduate courses at NQF Level 8, in staff-led, face-to-face, campus-based structured learning activities". In practice, this means:

- A first- or second-year semester module of 16 credits requires 4.11 periods (50 minutes) per week in a staff-led, face-to-face, campus-based environment; and
- A third-year semester module of 18 credits requires 3.9 periods (50 minutes) per week in a staff-led, face-to-face, campus-based environment.

That being said, the Council on Higher Education (CHE) developed a discussion document and introduced the REconceptualising LeArning and Teaching (RELATE) project to reimagine learning and teaching futures. The CHE also extended the concession for universities to continue offering courses through remote online distance/blended modes in 2022.

Continuity Plan

The COVID-19 pandemic of 2020-22 taught us that a preparedness to pivot between the different modes of teaching and learning at any stage is necessary. A key component of any contingency plan involves shifting between different modes of instruction without compromising instructional quality and student success. However, lecturers should be present and available physically or virtually (Bb Collaborate) during regularly scheduled class time to discuss difficult concepts and answer questions. This keeps students on track and makes them feel safe. The approach could be described as technology-enabled self-directed flipped learning, which is inquiry-based and assessment-driven.



It should be noted that the University of Pretoria's undergraduate courses are only accredited for full-time contact mode.

Study guides & clickUP: The study guide must be available on clickUP and should provide a clear, weekly work schedule so that students can keep up independently. It is preferable that a schedule with the dates, times, pre-class and in-class activities be made available to students at the start of the semester in the study guides and clickUP. Clear descriptions of the in-class activities that

pertain to the week's lecture/s should be provided to students in clickUP. Careful consideration should be given to the impact of the choice of activities on both academics and students as notional hours should be adhered to.

Levels of immediacy & student success: The most basic contingency plan, in case of a disaster, is the traditional (now dated) distance learning model, which focuses on self-study. However, different teaching modalities are better aligned to different student cohorts. In general, instructional models with low levels of immediacy, models that lack a sense of community, and those with low levels of lecturer and student interactions have lower undergraduate throughput rates. First-year university students, especially first-generation university students, enter a new and unfamiliar social and academic environment when commencing their first year at university. Adapting to this new environment is a significant aspect of the first semester at university.
Adjusting to the university environment includes becoming familiar with the university's teaching and learning ecosystem, including clickUP, the online learning management system. Research indicates that failure to adjust adequately to this environment in the first semester of any university programme is a strong indicator of failure to perform academically, not only in the first semester but later as well. This risk may increase substantially where first-year students do not have the opportunity to interact with the new environment in a face-to-face manner. An on-campus presence should support students' development of a sense of belonging through the formation of informal support networks. This is an important determinant of student success. Also, interacting with lecturers and professional and support staff in a face-to-face manner improves students' willingness to seek assistance and support.

Student success data and student support

A digital teaching and learning strategy needs to follow from a coherent research-based teaching and learning plan. This must be supported by a digital student success strategy based on an integrated data collection and analysis plan. The integration of digital teaching, learning and student success software with the LMS means not just connecting applications but also requires careful planning of the flow of learning and student success data. All the data from the various electronic platforms flow into one central system via the LMS (Blackboard), except for the Learner Case Management System. The University uses Pyramid Analytics software to collect all the data and to develop user-friendly student success dashboards for management, lecturers, and students.

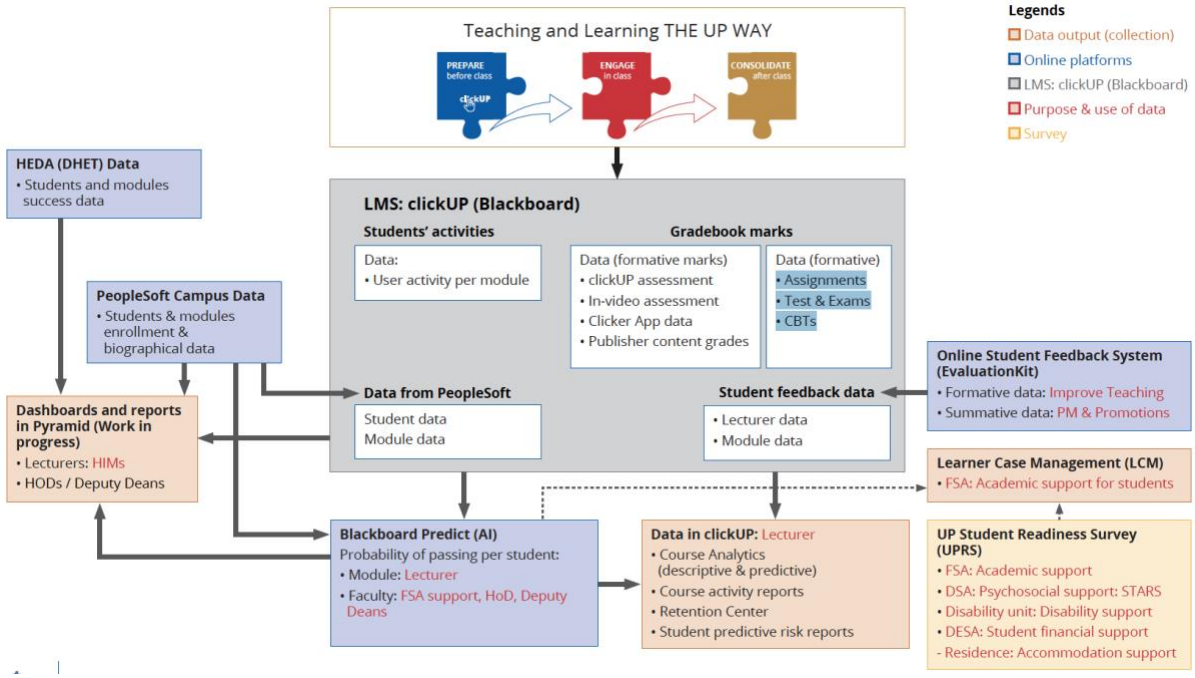


Figure: Teaching, learning and student success data flow diagram

The success of our students is our priority. The University of Pretoria is committed to the improvement of teaching and learning through dedicated support to lecturers and students. New technologies and artificial intelligence create many new opportunities to monitor and enhance student success.

The effective use of data to predict student success and identify and support at-risk students enables the University to develop early interventions to support at-risk students. Instead of looking backwards and acting after a problem has become apparent, the use of predictive analytics' early alerts can prevent a possible future problem. UP's student success-related technologies consist of three categories: identification, information, and support, which is further explored in the table below.

Identification	Information	Support
Predictive analysis	Support information hubs	Enhance accessibility
Analytics software	Dashboards and nudges	Support information hubs
Survey platform	Reports	
	Case management systems	

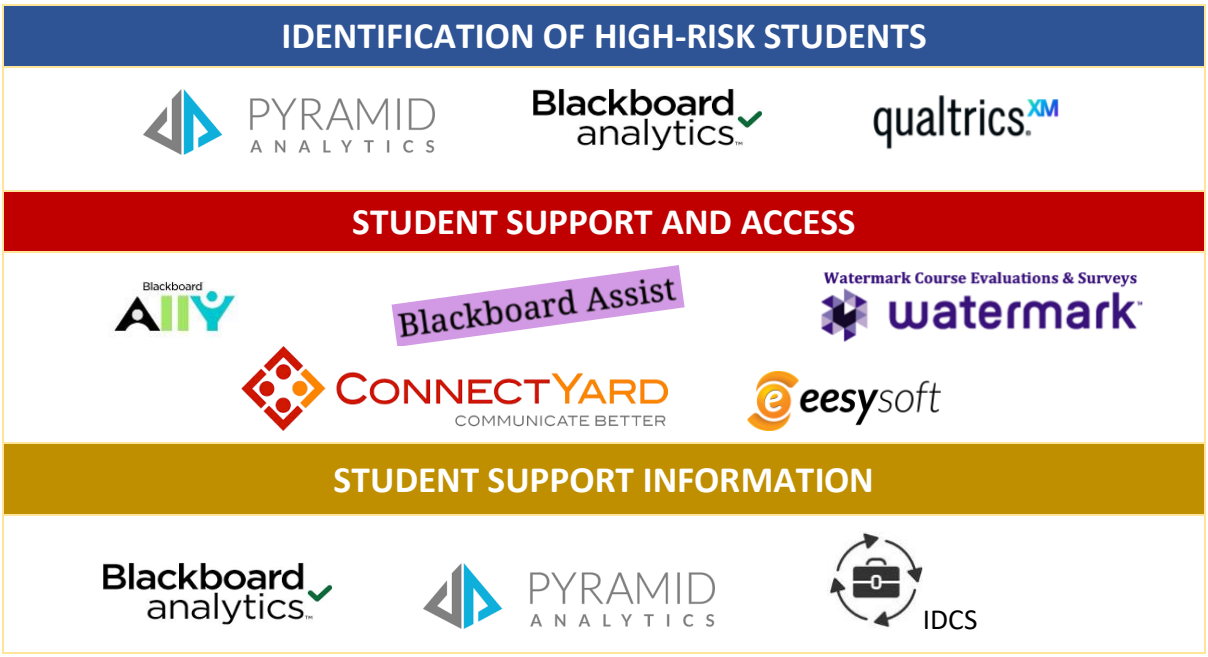
There are several data functions embedded in clickUP (Blackboard). The first essential requirement is the use of **Bb Grade Center** (see the Grade Center clickUP help site). The following are some of the important links: create calculated columns and set up a meaningful external grade column. The use of the grade centre will allow a lecturer to monitor their students' performance using the:

- Performance Dashboard (displays all types of user activity in your course),
- Retention Center (early warning system: identify at-risk students and send automated messages),
- Course reports (view summaries of course usage), and
- Analytics for Learn report (run different reports for your courses that keep track of how your students are performing).

Lecturers may enable the Blackboard Analytics for Learn Student Report and make it available to the students within each course. The report allows students to compare their activity and progress with their peers in the same course. Lastly, each undergraduate course also has access to the Student Risk Reports under Evaluation in the Course Management links. There are online courses on the use of the Grade Center and data in clickUP. The Metrical course focuses on using data in clickUP to monitor student participation. In contrast, the Grade Center course includes relevant information such as allowing students to monitor their progress using a progress mark, etc. Lecturers do not need to register for these courses; they can enrol themselves and continue. Upon completion of a course they will receive a letter of participation.

The University aims to create a more inclusive and supportive environment and broaden students' access to learning material. To achieve this, the University uses Blackboard Ally to enhance digital content for access and learning and help institutions build a more inclusive learning environment. It improves the student experience by assisting students in controlling course content with usability, accessibility and quality in mind. For students to manage their own needs and contact the many different support services offered by the University, we use Blackboard Assist in clickUP as a central information hub.

UP's digital student success ecosystem consists of the following:



Faculty Student Advisors (FSAs) offer a vital anchoring function to provide a 'safety net' service, advising and referring students for whatever form of support or intervention they require.

The primary function of FSAs is to provide co-curricular support and development, specifically, advice on module choice, dropping modules, study skills, time management, stress management, and so on. A new initiative introduced in 2021 was the introduction of peer advisors.

Their primary duties are to assist students with basic advising questions and serve as a resource to connect students with the FSAs (where applicable) and available campus resources.

Peer advisors will help undergraduate students by working closely with FSAs and answering common student questions related to the registration and deregistration of modules, degree/module planning, preparation for appointments with professional advisors, etc.

The University uses the UP Readiness Survey and predictive analytics to identify students at risk of failing. This allows the FSAs to identify and proactively support students who are at risk of failing, using targeted interventions such as the STARS peer mentorship programme or academic advising by the FSAs. The FSAs will then reach out to the at-risk students for training and support.

The information is also used to identify and refer students who have indicated financial distress, accommodation challenges, or a recognised disability, to the respective support departments (DSA, Finance, Residence, Disability Unit). Another model is used in Pyramid to identify at-risk students in need of support.

The University embarked on an exciting new initiative that should foster an evidence-based approach to improving teaching and learning and supporting student success. We created Pyramid dashboards, targeted at Deputy Deans and Heads of Departments, to achieve this.

Professional development, training and support

UP's Department for Education Innovation provides institution-wide workshops and priority courses to develop the teaching, assessment and e-learning skills of academic staff members. The courses enable lecturers to use clickUP, Turnitin, and QuestUP, as well as to create digital lectures. The Education Consultancy Unit presents many faculty-focused workshops and teaching and learning events, as well as the flagship Academic Induction programmes.

Please visit the **Department for Education Innovation's website** for more information, training opportunities, and support information. A team of dedicated instructional designers and educational consultants is also available to support you.

UP's Department for Education Innovation provides support for optimising student learning. The Education Consultancy Unit provides strategic leadership and change management for curriculum, teaching, learning and assessment innovation, as well as continuing opportunities for teaching development to build capacity to implement an inquiry-based approach.

The e-Education Unit provides strategic leadership, support and training opportunities for staff development to build capacity to implement a hybrid approach. Both subject-specific teaching innovation and pedagogical innovation are promoted and supported to enhance student learning. The available Scholarship of Teaching and Learning (SoTL) grants and the Flexible Futures conferences stimulate such innovation.

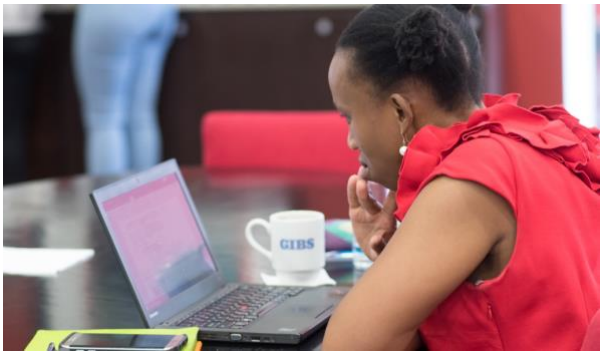
A team of dedicated instructional designers and educational consultants is also available to support you. You can also visit the Department for Education Innovation's website for the latest updates: https://www.up.ac.za/education-innovation.

Educational consultants can advise you on:

- learning design
- didactically sound hybrid teaching and learning
- assessment
- curriculum
- professional development, and
- the use of open educational resources (OERs).

Instructional designers can advise you on:

- e-learning and hybrid learning
- clickUP
- assessment technology (QuestUP, clickUP, Turnitin, Respondus)
- planning the use of computer-based testing (CBT)
- clickers, and
- in-video assessment.



Summary and concluding remarks

Educational research gives us a better understanding of how to develop the knowledge and skills our students need for their future. Students actively construct their own knowledge and understandings. We know that transmitted information does not automatically transform itself into student understanding. Students make meaning of the information based on their prior knowledge, and build new understandings by making logical connections between pieces of information. The application of knowledge and the effective retrieval of knowledge require a well-organised and connected knowledge structure. This entails a learning environment in which students actively participate to take control of (monitor and regulate) their learning. Effective teaching encourages students to construct a personal understanding and develop a critical attitude towards knowledge. Formative assessments make students' thinking visible. This enables students to monitor their progress and allows lecturers to meet students there. For this reason, we promote a flipped inquiry-based pedagogical approach. A flipped teaching approach requires students to prepare before class, enabling new teaching to build actively on existing knowledge. In this way, more time is available in class for inquiry-based teaching during which lecturers can focus on inquiry-based activities such as developing ideas, exploring consequences, justifying solutions, discussions, and solving problems.

In an effort to leave no student behind during remote/online teaching, various forms of inequalities and the impact of these inequalities were brought to our attention. It also shows us how those small things, like updated, quality study guides, matter. The UP study guide templates require lecturers to provide information to students about comprehensive assessment plans, and how to prepare for every lecture session. Although many students are left behind every year, we were all aware of these inequalities based on the online data gathered during the past months. For example, using the Retention Center, lecturers can see which students have not logged in for the past five days, and contact them. The LMS data allows us to see what we would not be able to see in a face-to-face environment. Students who can afford to pay for transport and do not attend classes are largely unnoticed, but students without devices or data made us realise how many students are left behind. We can see the student engagement data and know who attends classes. On the other hand, traditional teaching also deepens inequality. In an article in *The Chronicle of Higher Education*, Supiano (2020) explains how traditional teaching disadvantaged black and Latino students (in the USA).

He suggests a strong focus on two main components of inclusive teaching: "putting more structure into a course, giving clear instructions so that all students know what to do before, during, and after class; and thoughtfully facilitating class discussion, so that everyone can participate."[4] An online/remote environment provides rich and actionable data about student engagement, and enables us to provide more effective support. This, combined with essential face-to-face interaction, may enable us to truly leave no student behind.

The success of remote teaching during the COVID-19 lockdown period and the feedback from students and lecturers suggest that a mix of remote, online and contact teaching is ideal. It provides the opportunity for lecturers to create a new learning environment for students. Other possible advantages and benefits of this hybrid model are that it:

- promotes independent learning
- provides rich data about student engagement
- requires fewer lecturing halls and parking spaces
- is a more sustainable solution, with less traffic, and
- saves time on the road as well as moving between classes.

[4] https://www.chronicle.com/article/Traditional-Teaching-May/243339?key=17K21y7n_SjUZ04t4-9d7lOkgeOIOadPLiv9KXWx066EvvWTSLX9pc7NmdtyoL...

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