

Topic: Who are our students and how do they learn

What is my job as a teacher?

Have you ever asked yourself what is your job when you teach a class? Is your job merely to teach because that is what you are doing? Or do you view your job as a more expansive definition of the goal you are pursuing, in this case, helping your students learn.

If you ponder on that for a bit you will come to agree with me that by expanding how we define our job, it frees our thinking and gives us more choices on how we can design our classes to make it more meaningful for our students. In this video I will share some pointers and techniques to know our students better to inform our course delivery choices.

Reference: <https://www.youtube.com/watch?v=IdMvWLARF1w>

Why do we need to know the students?

A Student's mind is not a blank slate, they have expectations, experiences and concepts that will shape their interpretation of subject matter. It is part of our responsibility to understand those preconceived notions that may or may not be impediments to learning in the classroom. Once we recognize those, the next step would be to use the pedagogical approaches available at our disposal to enable students to fulfill their needs and achieve their goals.

What does it mean for SJSU students to succeed in life?

One might be tempted to say "I have been a student once, I know what concepts are fundamental and important in a particular topic and can design the course with me as a student in mind" but the fact is you are NOT your learner. Let me share with you some findings from scholars who have looked at this question.

How are the students different?

You choose a life of a scholar, designing and directing your attention to the problems you cared about deeply. For that purpose, you willingly spend many hours researching, reading and engaged in scholarship activities. In contrast your students may not have the desire to go into the library and spend a couple of weeks there let alone a few hours.

Charles Schroeder* and others based on data collected on college students, concluded that about 50% of the students are categorized as “concrete active”. That is, the students learn best by seeing the phenomenon before learning about the theory. 50% of the students compared to about 10% of the faculty members.

On the other hand only about 10% of the students are abstract reflective learners ,who prefer going from theory to practice, who are autonomous and self directed or perhaps require minimal direction.

This has implications in how we teach our students and provides perspective when the majority of the students perform better when the assignments are structured and provide a linear learning experience.

Further according to research, students today are spending much less time on homework as compared to their peers a decade before. Instead of spending time out of class thinking about the topic, more and more students now spend out of class time earning money or taking care of their family responsibilities. This might shed some light on why we are seeing a decrease in motivated learners in our classroom.

Third, Students are picking applied fields and focusing on degrees that can get them a job quickly

Fourth, the class composition is changing with a more racially and ethnically diverse student body.

Reference: *Charles C Schroeder, “New Students -New Learning Styles,” Change 25, no. 5 (1993): 21-27

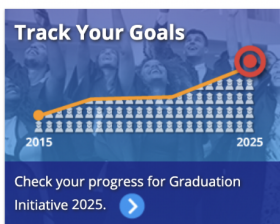
Therese Huston “ Teaching what you don’t know” Chapter 6: Teaching students You don’t understand

How can we learn about our learners?

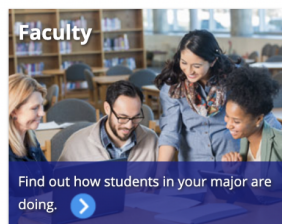
So how can we learn more about our students?

Before we step into our class room, there are two excellent portals that provide a view into the students in CSU system

Graduation Initiative 2025



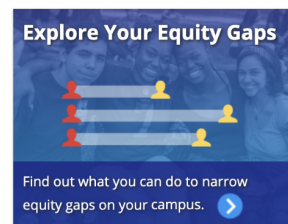
Faculty Dashboard



CSU by the Numbers



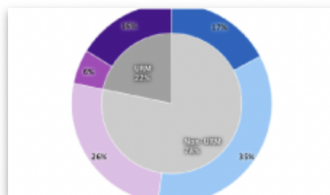
Equity Gaps Dashboard



-- CSU student success dashboards provides four main dashboards as you can see on your screen. Of these the faculty dashboard provides the background and academic patterns of the students. You can drill down to specific majors offered by the college on a specific campus. It is fantastic as it lets you see not only demographics by a particular cohort but also trend over time.

<https://csusuccess.dashboards.calstate.edu/public/faculty-dashboard>

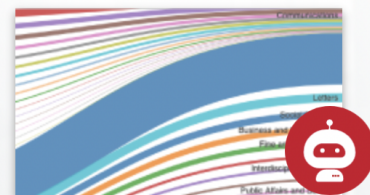
As you review the contents of this report, consider asking yourself...



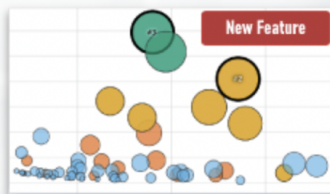
Who Are My Students?



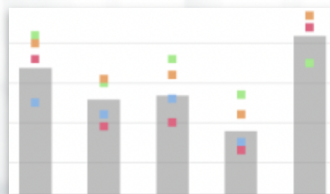
How Quickly Do They Progress Toward Degree?



What Paths Do They Follow?



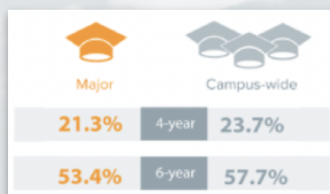
In Which Courses Do They Struggle?



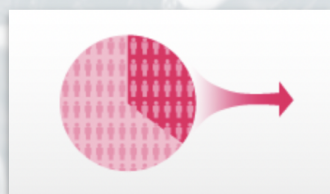
Which Courses Have the Largest GPA Equity Gaps?



Once Students Achieve Junior Status, How Long Do They Take to Graduate?



What Are Their Academic Outcomes?



Which Students Leave Before Graduating?

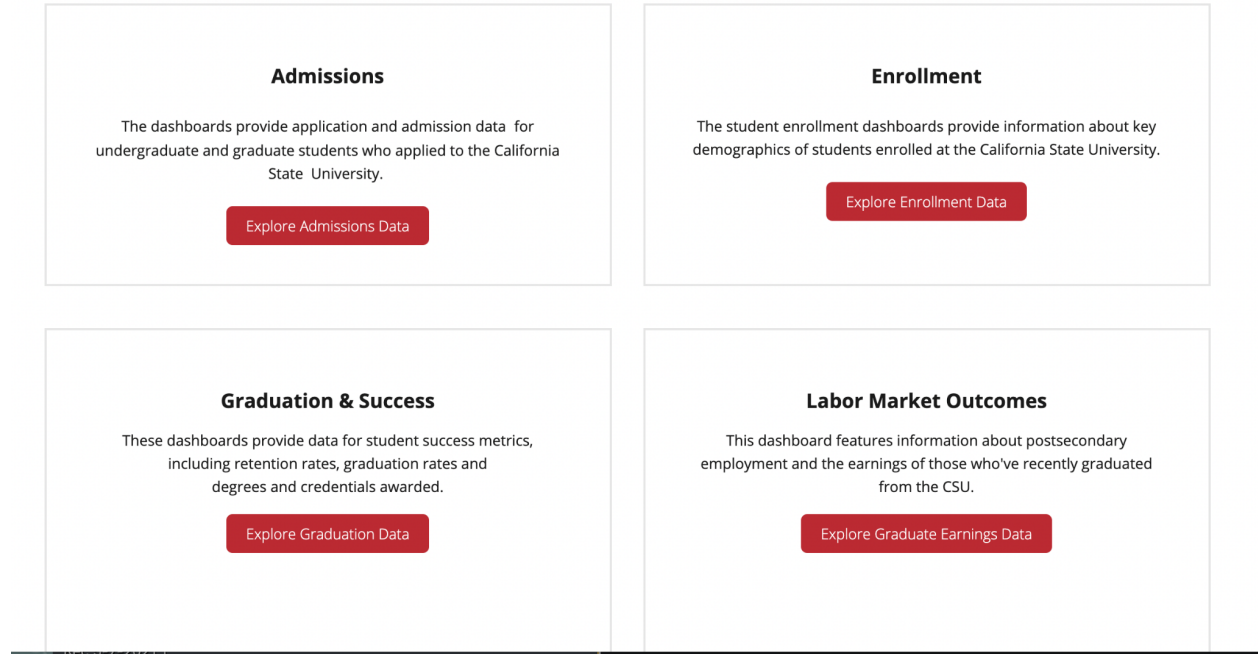


Which Students Enroll in Postgraduate Programs?

Explore the Data

Another portal maintained by the CSU Institutional Research and Analysis has four dashboards corresponding to admissions, enrollment, graduation and success, labor market outcomes

Dashboards



In almost all these dashboards you can drill down to the campus, college and major level.

<http://asd.calstate.edu/dashboard/enrollment-live.html>

-- Another approach for learning about your student is to conduct an incoming survey to better understand their context, needs and goals. A starter list of questions to better understand your learners could include:

Survey

1. What is their course load that semester
2. What are their goals with the class
3. What are their goal with the degree they are pursuing
4. What questions they have about the course
5. What kind of problem do they think they might encounter in the course that would hurt their performance
6. What are their expectations for this course and/or instructor
7. What have you heard about this course

You can find the template of the survey I use in my class Start of Semester Survey

-- Plan to conduct periodic quick survey (focus on self reflection on their performance, what topics they found interesting and some concepts they are struggling with) You can find the template of the midpoint reflection I use in my class [Midpoint Reflection](#)

-- With all this information spend a few minutes to build learner personas that capture:

1. General background about the learner
2. Learner needs
3. Learner goals
4. Other considerations

Reference: <https://teachtogether.tech/en/index.html#s:process-personas>

Some tips from Educational Psychology? AKA What do we know from research in learning about designing lessons?

I would like to start with citing the work of Patricia Bener who researched how nurses moved from being a novice to expert. The key finding was that learners moving through these cognitive transitions don't necessarily amass more knowledge but what they found was the expert organized the knowledge differently, in what we call these days as mental models.

Expert's mental models have important pieces of information and how they relate. Novice might have lot of concepts and even connections missing from their mental models

Experts : know more and knowledge is organized differently. Mental models

Novice: mental models are rudimentary, incomplete, shallow and often contain misconceptions

Our job is to help the novice build that mental model by bridging the gaps between what's already known and what's about to be learnt

Design lessons:

1. Experts can be given a problem to be solved after a concept is introduced vs novice would need more structured problems. For instance try to use fading examples as initial formative assessment as where one or more pieces of solution is missing and the student is able to visualize both the process and arrive at a solution.
2. Cognitive load theory suggests teaching one skill at a time. Minimal instruction increases the germane and extrinsic load and makes learning the new skill slower.
3. Try to introduce and represent the concepts every few weeks so the students can see the connection between the concepts.
4. Reflection to give students opportunity to reflect on how the concepts relate to prior knowledge and what other applications could be in a different context

5. Assess prior knowledge by short quiz or tests or “create” prior knowledge. That would help you tailor your lessons to meet the students where they are and make the learning more effective.

Reference:

<https://www.learning-theories.com/>

[Teaching Tech Together](#)

Context - what got me interested in this field

Thank you for listening to me today, I am a lecturer in the ISE department where I teach R/Python programming to seniors and graduates and Math foundations for data science to graduate students. Before teaching I was a data scientist for over a decade at various companies in the silicon valley. The presentation today is the result of researching, designing and implementing most of these techniques in my classroom. I am interested in learning new ideas in pedagogy and if you would like to chat, please feel free to reach me at shilpa.gupta@sjsu.edu. Thank you for listening