The Essentials of Recognizing and Addressing Students' Prior Learning: Evidence-Based Guidance

What Is Prior Knowledge?

- Prior knowledge is actual knowledge, skill, or ability which students bring before a certain learning task (Jonassen and Gabrowski, 1993, as cited in Dochy, Segers & Buehl, 1999).
- It is dynamic in nature, structured and contains concepts and understandings of how to monitor, assess and regulate those concepts that individuals know (Dochy & Alexander, 1995).

What Is Prior Learning?

The recognition of prior learning:

- It is a process of giving official acknowledgment to formal, informal and non-formal prior knowledge (Stenlund, 2010).
- The term is also known as the Prior Learning Assessment and Recognition (PLAR), Prior Learning Assessment (PLA), the Assessment of Prior Learning (APL), the Assessment of Prior Experiential Learning (APEL) (Moss, 2018).
- Although RPL is on the rise, PLA (prior learning assessment) and PLAR (prior learning assessment and recognition) are the most popular terms in North America (Conrad, 2010).
- Canada occasionally uses accreditation of prior learning (APL) rather than assessment of prior learning (Stenlund, 2010).

What Learning Benefits Does Activating Prior Knowledge Offer?

- Prior knowledge is an effective aid for learning new knowledge (Dochy, Segels & Buehl, 1999).
- Activating the prior knowledge at the beginning of a learning process (Gurlitt & Renkl, 2010)
  - provides a framework for the new information to be organized and assimilated,
  - reduces the time for knowledge components to be recalled,
  - produces cues to access the information from the long-term memory,
  - enables the reconstruction of information that is not directly retrieved, and
  - constraints learning goals to be pursued.
- It increases in self-esteem and confidence among the applicants (Stenlund, 2010).

- It creates flexibility and opportunities for responding to the current labour shortage in Canada (Conrad, 2010).
- It provides a bridge between the workplace and academia (De Graaff, 2014).
- It can offer valuable information as to the instruction and guidance for future learning (Dochy, Segers & Buehl, 1999).

How Should You Assess and Recognize Prior Learning?

Meaningful learning and successful education require prior knowledge

- If you want to stimulate meaningful learning during the class, connect new information to the existing knowledge base (Gurlitt & Renkl, 2010).
- According to Maciejewski (2016) and other scholars, the most successful education could be measured by how well you connect the new information to the existing knowledge

Prior knowledge and performance

- Prior knowledge may impact one's study skills and performance, however it is not the only variable which influence learner outcome (Dochy & Alexander, 1995).
- Learning strategy and the structure of the prior knowledge are also important for student performance (Dochy, Segers & Buehl, 1999).

Assumptions about prior knowledge

Confusion can arise from the lack of knowledge and assumptions made by the students about each other's cultural norms and practices. Similarly, rather than assuming that instructors lack of knowledge about teaching and learning, the focus should be on building upon the existing knowledge base (Olesan & Hera, 2014). Ramburuth & Tani (2009) found that there are significant differences among students born in Australia, Asia and other countries on the experience and learning perceptions. The differences are mostly rooted in prior learning and preparation before entering to undergraduate program, self-confidence and the classroom discussion participation, interacting with peers and teaching staff from diverse cultural backgrounds.

Interest and prior knowledge

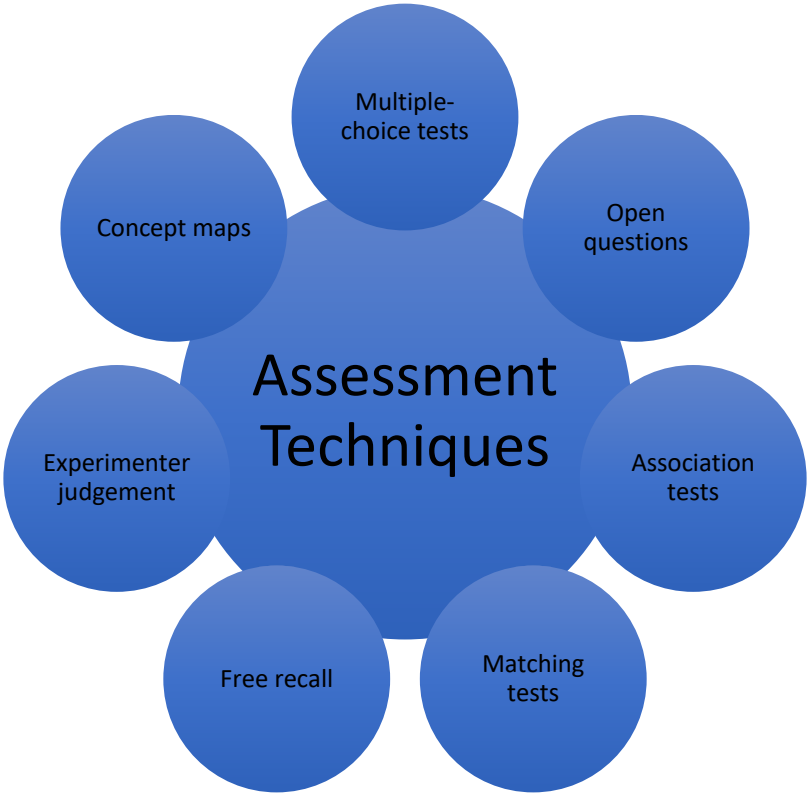
- Interest inspires deeper levels of comprehension processes (Tobias, 1994)
- Interest leads to greater use of imagination (Tobias, 1994)
- Interest may give rise to more intensive and wider network of relevant associations than are invoked by prior knowledge (Tobias, 1994)
- If students have both low interest and low prior knowledge in a given topic, the learning process will suffer the most (Carrell & Wise, 1998).

Dealing more adequately with diversity in the classrooms

- Divide students into small groups in order to give personal attention, diagnose and prescribe individuals (Cross, 1983).
- If your educational institution has specialized services such as counselors, financial aid officers, peer tutors, basic skills specialists and etc., then teach in large group (Cross, 1983).
- Spend your time on designing a new education system which can handle student diversity rather than addressing their special needs (Cross, 1983).
- Help your students to reach their destinations, and diagnose and provide remedies for their learning problems (Cross, 1983).

- Coherent and consistent instruction in writing is the most common problem that students are struggling. Provide a clear definition of good writing and support it by published institutional grading criteria (Cross, 1983).
    - Determine the number and types of errors that you could tolerate in correcting and grading the students' writing. Keep in mind that the reasonable expectation from a college graduate that they need to write grammatically correct prose.
- Develop critical thinking and problem-solving skills of the students, because it is reported that these are the primary areas in which first-year students need further development (Lundell, Higbee, Hipp, & Copeland, 2004, as cited in Conley, 2007).
- Organize a cross cultural training.
    - It will lead understanding and appreciation among students in each other's cultural influences on various project aspects, such as concept of time and work habits (Hoda, Babar, Shastri & Yaqoob, 2017).
- Motivate students to take socio-cultural issues seriously.
    - You might consider giving formal credit to demonstrate knowledge and skills in socio-cultural issues (Hoda et al.2017).
- Support different English accents in the classroom.
    - Due to different accents or having different native languages, encourage students to talk slowly, take classroom notes, use both verbal and non-verbal communication. (Hoda et al.2017)

Assessing the prior knowledge



- The kind of assessment techniques used to assess prior knowledge: (a) multiple-choice tests, (b) open questions / cloze tests / completion tests, (c) association tests, (d)

recognition tests/ matching tests, (e) free recall, and (f) experimenter judgement (Dochy, Segers & Buehl, 1999).

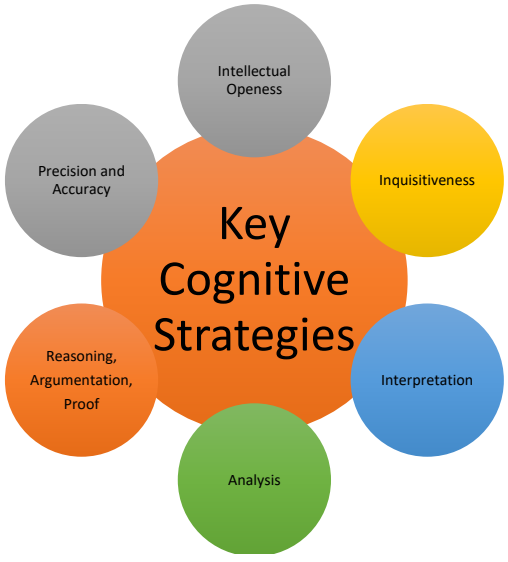
- It is recommended to use concept maps as a tool for educators to get examine students' prior knowledge at the beginning of the learning process (Novak and Gowin 1984, as cited in Gurlitt & Renkl, 2010).
- If you leave assessing the prior knowledge to students, challenges may occur. Such, students with little prior knowledge could rate their own knowledge high and oppositely who possess a large amount of prior knowledge could estimate their own knowledge little. This is explained by the students who know a lot in an area also know what they do not know and they could think that they are missing quite large. As a result, it is essential for researchers and instructors to consider which form of assessment is used (Dochy, Segels & Buehl, 1999).
- To assess prior knowledge, Hashweh (1987) suggests looking at four dimensions:
    1. Knowledge of subject,
    2. Knowledge of other discipline concepts, principles and its relations,
    3. Knowledge of discipline higher-order principles or conceptual schemes, and
    4. Knowledge of approaches or of different ways of relating the subject to other discipline whether to compare it with other topics, concepts, principles, or conceptual schemes.

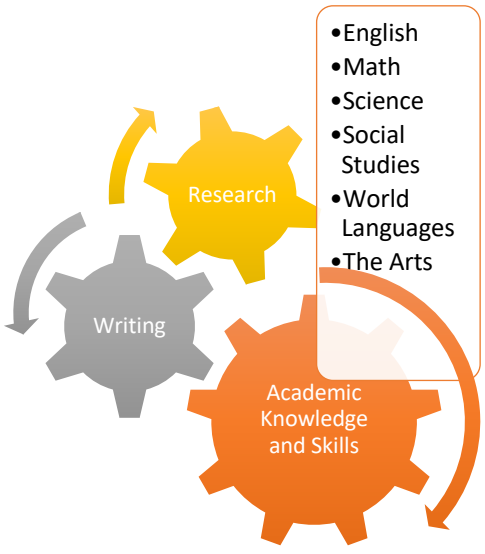
Gender differences in prior knowledge (Carrell & Wise, 1998)

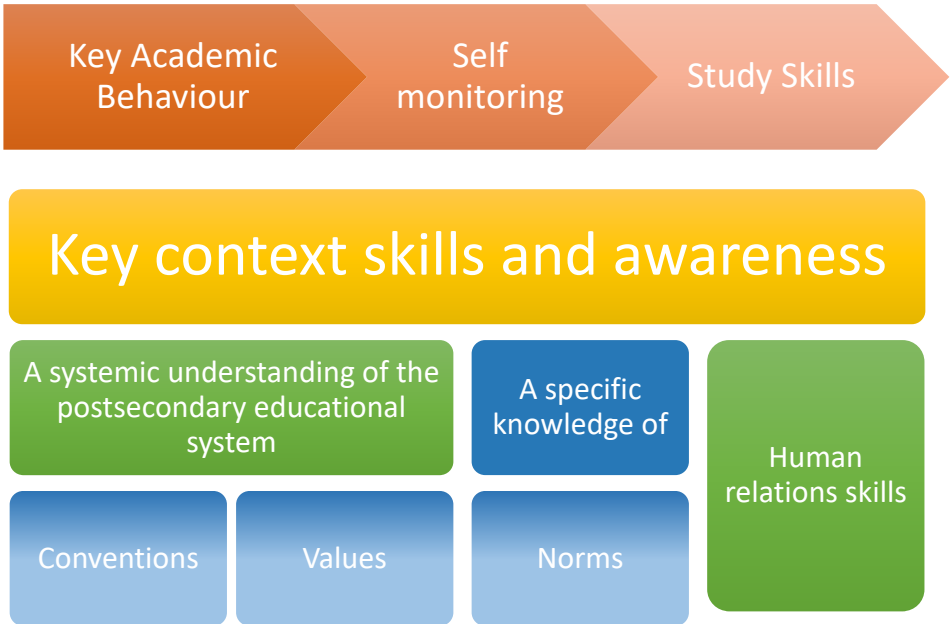
- Gender differences may function differently with respect to the interactive effects of prior knowledge and topic interest, as well as of the fact that the importance of these variables may differ at different proficiency levels.
- Females actually performed better on understanding the texts in which they had low topic interest.

College readiness and prior knowledge (Conley, 2007)

Students need to have prior knowledge and skills in order to succeed in courses. College readiness is an essential concept which means operationally as the level of preparation student needs in order to enroll and succeed. According to Conley (2007), high portion of college students need remedial or developmental education during their studies. For that reason, he came up with key terms and skills which college student has in order to succeed.







Mature students

- Mature student definition is adopted by Phillips (1986) study whose age is 25 and over, thereby emphasizing the likely time spent outside the education system and within the industry.
- Most of the mature students had suffered from unemployment in their pre-higher education experience (Phillips, 1986).
- The more preparatory steps that mature students take before their studies, the fewer problem they encounter during their studies (Phillips, 1986).
- By students get older, knowledge and interest may come to correlate as examples exist in adult education (Carrell & Wise, 1998).

Suggestions for RPL

- Use open learning - flexible, negotiated and suited to each person's needs –could be used as a strategy for solving challenges for recognition of prior learning (Conrad, 2010).

Important fact on RPL

- There is no difference between RPL students and other students in academic achievement (Stenlund, 2010).

What Challenges Arise When Assessing Prior Learning?

- It is hard to assess prior knowledge of the students (Carrell & Wise, 1998).
- There is not simple functional tool to assess and activate prior learning (Gurlitt & Renkl, 2010).
- If students have an interest in a subject, it does not mean that they possess a large amount of prior knowledge, similarly if they possess a large amount of prior knowledge, it does not mean that they are interest in that subject. Knowledge and interest do not necessarily correlate (Carrell & Wise, 1998).
- Students found activating the relevant prior knowledge difficult because they do not spontaneously engage in monitoring what they already know and do not know (Gurlitt & Renkl, 2010).

- If instructors are teaching for many years, they do not want to learn new teaching practices to activate the prior knowledge. Firstly, the value of new approaches in relation to the existing practices should be demonstrated for educators (Oleson & Hera, 2014).
- Educators perception on the amount of prior knowledge that students have might impact the instruction. In result of this, the conflict may occur between how students view the subject and how the instructor provides it (Maciejewski, 2016).

There is not national framework for recognition of prior learning. In Canada, all educational decision making is made by provincial jurisdiction.

Maciejewski (2016) gives an example:
Instructor believes that the students have fragmented, procedure-oriented perception on mathematics, therefore the instructor thinks that the students are not prepared for a conceptually-oriented task. Unfortunately, this may be a missed opportunity for learning. Such a disconnection can have profound implications for student development.

In this current time, this topic suffers because of (Conrad, 2010)

- (1) term confusion which differs from country to country,
- (2) lack of time which is given by academic faculty and portfolio assessors and
- (3) lack of motivation of rewarding system.

- It is time consuming to assess the prior learning. Unfortunately, employers, faculties, and social services, tend not to recognize immigrants' prior learning (Stenlund, 2010).

Consider These Issues When Assessing Recognizing Prior Knowledge in Specific Disciplinary Areas

Commerce	• In **professional programmes**, discipline, knowledge base and curriculum are the main, determinant of the feasibility of implementing RPL in some cases (Haris & Wihak, 2017),
Engineering	• **Engineering** students should be encouraged to expose themselves to different accents and pronunciations styles to improve verbal communication with teams during their area courses (Hoda et al.2017). • Mostly students who are confidence in science and math courses continues STEM major for higher education (Phelps, Camburn & Min, 2017). • The secondary school GPA were the strongest impact on first and final year academic achievement as well as graduation or withdrawal (Derr, Hübl & Ahmed, 2018). • Student's background and learning preferences vary. While delivering e-learning training, try to use individualized approach which allows the course to become flexible. Mironova, Amiltan, Vendelin, Vilipold, & Saar (2015) proved that students got higher grades when the e-learning training delivered according to students' prior knowledge (beginner, advanced user, or expert) and students' learning preferences (active and reflective,

	sensing and intuitive, visual and verbal, and sequential and global).
Fine Arts	No sources identified in this review.
Humanities	• **Tourism Management** and **Journalism** appeared to be the most open to use of RPL (Haris & Wihak, 2017). • Teaching abstract concept and rules in argumentation has a positive impact on students' general academic success (Quintana & Schunn, 2019). • Collaborative learning setting in the classroom is effective and efficient for the knowledge co-creation process because interactivity among students reduce the gap between students with prior knowledge vs. student without prior knowledge (Chan, Lo, Ng, Cheung & Kiang, 2017).
Natural Sciences	• The **physics** teacher's knowledge, compare to biology teacher, more stable, however **biology** teachers had more the depth of the knowledge (Hashweh, 1987). • Subject matter knowledge is measure by differentiating two main **physics** concepts which are force and work (Hashweh, 1987). • "**Physics** teachers used the force/motion and the work/energy schemata to categorize, however **biology** teachers used the surface features of the problems which had lever, pulley and ramp categorizations" (Hashweh, 1987, p. 112). • Science programmes was the least open to the use of RPL (Haris & Wihak, 2017). • In **chemistry class**, if you are using computer simulations, that will work as tools to confirm their predictions and conclusions for the students who have higher level of prior knowledge. For the students with a low level of prior knowledge, the computer simulation will work as a major resource to generate answers for accomplishing the tasks after several trials (Lui, Andre & Greenbowe, 2008). • Rau (2018) had a paper on how do sense-making skills and perceptual fluency relate to learning of chemistry knowledge. The author found that *sense making activities* did not enhance learning and *fluency building activities* enhance learning for student who has high prior knowledge.
Social Sciences	• **Tourism Management** and **Journalism** appeared to be the most open to use of RPL (Haris & Wihak, 2017). • Angelovska (2017) adopted Input-Practice-Output (IPO) method in her paper on teaching L2 grammar acquisition. The author recommends that during the input phase, you could precisely use similar adverbs in order to learners to sensitize the correct word order. Plus, she suggests using colors, sizes, blurbs, underlining, fonts an intonation for your design of the materials.

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