Understand and Promote Your Students' Intellectual Growth of Reasoning

Our students are on a journey that takes them through various stages of thinking and understanding themselves and how they learn. If we can recognize and anticipate those stages, we are better able to respond effectively and assist students en route to becoming critical thinkers.

We will also be able to let go of the frustration that comes our way when students resist certain kinds of thinking or seem stuck with perspectives that do not serve them well in their learning. Such is the function of the "Perry Scheme" or similar descriptions of the stages of intellectual growth.

The late William Perry, professor at Harvard, originally published his research in 1970, using as his subjects the white males in his university courses. Subsequent researchers (for example, M. Belenky, Women's Ways of Knowing) have updated the original thesis by Perry, to uncover its relevance for a broader population and other researchers have created their own models of knowing – but often most of the researchers follow a similar progression of understanding learning and advancements in the development of learning.

Perry identifies nine sub-stages with respect to intellectual and moral development, but the stages can be grouped into four basic stages: Dualism, Multiplicity, Relativism and Commitment to Relativism.

The summary provided in this document is a pragmatic simplification of the scheme. It assumes that an individual student at any single point in time may be at a different stage regarding different subject area content or exposure to new content.

Most post-secondary students enter college or university at the multiplicity stage, but many first-year students may still feel the instructor (and/or the textbook) is the disseminator of all truths.

Students who are not yet at the relativism stage may not understand active learning techniques and may push back on strategies that shift their roles from being recipients of knowledge (passive learners) to being participants and collaborators.

Intellectual growth is related to the development of critical and reflective thinking – a core competency of the British Columbia K-12 curriculum. Typically, the development of critical thinking falls into four key areas as follows:

1) analyzing and critiquing

2) questioning and investigating

3) designing and developing and

4) reflecting and assessing

Becoming familiar with the various ways in which intellectual growth of reasoning and critical thinking develop may cause you to question why much of education is concerned with what is taught and not so much focused on how students think and reason.

Review what is presented below about Perry. But also explore other ways of looking at intellectual development and growth of cognitive process especially discipline-specific ones.

Dualism – Received Knowledge

Black and White – Right/Wrong Answers

Student Attitude Toward Learning	Student Perception of the Teacher	Student Value of Critical Thinking and Learning Processes
• Valid questions have specific answers • Answers are either right or wrong – simple and definitive • All problems are solvable • The more you know the smarter you are. • "Basic" stage is right/wrong, good/bad whereas "Full" stage is recognition of other perspectives but those that differ from own are wrong/bad • Simplicity is correct, complexities are wrong	• Teacher has authority with all the right answers • Teacher awards grades based on quantity of information retained and remembered • Other authority figures like "experts" have "the answers"	• Knowledge is comprised of an accumulation of facts. • Learning means memorizing • Learning means getting an "A" • Learning means getting the right answer that the teacher told me • There are strategies to remember the right answers and tools to find the right answers • There is no 'both-and' in this stage. • Must learn the right solutions and ignore other perspectives

Common Questions and Statements from Students

- Will this be on the test?
- What is the right answer?
- I don't understand why I lost marks on this question.
- You said to write two pages for the essay and so I wrote two pages.
- Memorizing worked in high school, why not now?
- Why won't the teacher answer my questions?
- I am lost in this class; the professor is clueless!

Frustrations for Students

- Students find questions without clear-cut answers are perceived as "tricky," unfair and not useful
- Students struggle to really grasp a concept because they are focused on the facts in previous learning and haven't come to understand how learning is full of relationships and connections
- Mostly courses in non-math and non-science tend to frustrate students who have dualistic thinking – so humanities and social sciences courses are more challenging for students

Other Notes

- Students may feel that when authority figures do not give them the answers, they are holding back to teach something or trying to teach them to think.
- While dualism is often seen more so in elementary and secondary school environments, post-secondary students and adults can exhibit dualistic thinking in different circumstances or in relation to their job or role
- If evaluation is a lot of multiple choice, short answer type of questions that are not of higher order thinking, then dualistic thinking can be reinforced, or some students may slide back to dualistic thinking
- If content is presented with only one viewpoint or there is a heavy reliance on one source of information (e.g., a textbook) then pushing students out of dualism thinking is tougher
- There are many disciplines and aspects within disciplines that are with only right or wrong answers (e.g., law, math, physics) – dualism really isn't about this

Multiplicity – Subjective Knowledge

Grey – Conflicting Answers and Multiple Opinions

Student Attitude Toward Learning	Student Perception of the Teacher	Student Value of Critical Thinking and Learning Processes
• There are two kinds of problems: those whose solutions we know; and those who solutions we don't know yet (early multiplicity stage) • Most problems are those with solutions we don't know yet– therefore everyone has a right to their own opinion or there are problems that are not with solutions – therefore it doesn't matter which solution you choose (late multiplicity) • All knowledge is suspect; all opinions and statements are equally OK	• Teacher may be the authority, but they represent just another opinion • Grades are awarded by "good expression" or are arbitrary • There are many people who seem to have knowledge and so not sure who to trust	• Learning means playing the teacher's game to get the "A", there is only opinion, and one is as good as the other • Just parrot back the answers and solutions that are already provided • There are conflicting answers and so must trust their 'gut' and not any authority or external sources as they can't rely on them anymore • Learning is about identifying 'right solutions" • Learning is also about hypotheses building for unanswered questions

Common Questions and Statements from Students

- I think I'll switch away from English and study math instead (want to move away to a safer discipline with clear answers and less uncertainty)
- Everyone has a right to their own opinion
- Doing well at college is playing a game - find out what the teacher wants and give them that to get your marks
- I am going to drop out of school – I can't stand college because all they want is the right answers, yet no one gives you the right answers and instead they give you many answers
- How can you give me a "D"? (in a self-expression writing assignment)
- Even though the teacher doesn't have all the answers, they still control most of them.
- How can the teacher evaluate my work if it's just a matter of OPINION whether it's good or bad?

Frustrations for Students

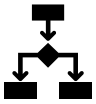
- Grades are based on whom the professor likes…and students think that learning is a result of favouritism or popularity because students are just seeing multiple perspectives and with no clear understanding of what is going on yet
- There is so much ambiguity (e.g., in some realism like sociology, politics etc.) that this likely is due to the instructor's lack of expertise or research on the subject
- This is a very difficult transition time for students

Other Notes

- Metacognition (or thinking about thinking) has not yet developed at this stage.
- Students are usually lacking in awareness or strategies about how they learn
- While students have moved on from their black/white stance on learning, they are now conflicted with so many possibilities, so many opinions and so many perspectives on a topic.
- Typically, you see students not just wanting to know the correct answer but the teacher's preferred answer or what the teacher said or did – as this is the only guiding direction right now for figuring out how to 'play the school game' and get the grades
- Teachers need to have discussions and questions and activities that are muddy, mucky and not with clear cut answers or solutions to show students this is how thinking develops

Contextual Relativism – Procedural Knowledge

Everything has Context – All Answers Could be Correct – Not all Equal



Student Attitude Toward Learning	Student Perception of the Teacher	Student Value of Critical Thinking and Learning Processes
• Knowledge is suspect, but some things are supported by evidence and reasons • Information changes and can be interpreted using the tools of the discipline • All proposed solutions are supported by reasons or preferable theories, so you just need to identify that theory • Some solutions are better than others depending on context – so context is important • Ambiguity is a way of life	• Teacher is a conversation partner, acts as guide, shows the direction, helps students discover • Models of "open" acceptance of change rather than rigid authority • Grades assess appropriate support for theoretical stance	• Learning means realizing that what we "know" is colored by perspective and assumptions • Facts, data are essential, but not sufficient. • Learner sees a necessity to make choices and commit to a solution • Need to learn how to evaluate solutions by explicitly working with criteria that support theories • Logical consistency • Agreement with data • Verifiable causes that explain and predict

Common Questions and Statements from Students

- In English writing classes there are different approaches for different purposes.
- It all 'depends', so we must learn to evaluate solutions to figure out answers.
- I really don't get what is going on in college – what I thought was correct is now with so many options.
- I'm surrounded by students who are clueless.

Frustrations for Students

- Students often feel they need more information and more than one perspective, and so a course or a class may feel narrow or limited in how it treats the subject matter.
- Some post-secondary classes are often perceived as not challenging enough.
- Students become frustrated with approaches to teaching that rely heavily on the textbook or a set curriculum.

Other Notes

- Likely the most uncomfortable of all the stages. Students may be in a stage of discomfort for some time as no way of figuring out conflicting meanings and now way to reconcile challenges.
- Students may just refuse to deal with decisions at this point in that hope that some authority will come back and make things better. Students yearn to go back to simpler times when they refuse to accept ambiguity.
- Students may retreat to previous stage for a while to escape the discomfort.
- Eventually students will come to see the ways to make meaning for themselves as they progress through later parts in this stage.

Commitment to Relativism – Constructed Knowledge

Knowledge is Not Isolated – It is Relative but We Do Our Best to Understand

Student Attitude Toward Learning	Student Perception of the Teacher	Student Value of Critical Thinking and Learning Processes
• Learning is the growth of a personal commitment unravelling complexity • Knowledge affects personal actions outside the classroom • What matters are facts, feelings, and perspectives and how students will act upon them • Learning is about making a commitment to a position, approach, direction • Ambiguity and uncertainty are a part of personal identity • Approach problem solving using diverse frameworks • Complex resolutions are better than simple answers	• Teacher is a source among other sources • Instructors are mentors and companions in the search for potential paradigms • All views different and all have validity in their own context • Teacher must model and help the personal search for values associated with preferred paradigms and defensible positions	• Learning includes making choices, and taking responsibility for those choices • The values are rooted in the disciplines • There is a flexible paradigm comparison • Lots of questions being formulated • The commitment to the choice is an ongoing, unfolding, evolving activity and part of learning • Student commits to a set of values, a vocation, a person or some other ideal • When committed they can stand in uncertainty as the commitment offers structure for the ambiguity

Common Questions and Statements from Students

- In English writing classes I feel I need to be prepared to defend the choice I made.
- "This is right for me" – I am making a choice that benefits me.
- I just don't fight the ambiguity and uncertainty anymore – it is part of life.
- I have different points of view in different classes and have comfort with that.

Frustrations for Students

- Students need to be in classes with constructivist/creation of knowledge approaches.
- Students are frustrated when they are confined to a specific assessment or project that doesn't allow them to make choices or explore other options for sharing their understanding.

Other Notes

- Students need ongoing opportunities to explore options and make decisions
- They need support for living in the ambiguous world and how to take a stand for a choice
- At this stage of development students have a good grasp of the aspects of critical thinking and routinely engage in reflection and analysis of their learning

Other Perspectives on Intellectual Growth

The University of Calgary's teaching and learning centre produced a very thorough analysis of Perry and outlined other perspectives as briefly summarized below. See Blackman, Galicia. "Cognitive Development: Students' Beliefs about Knowing." *Taylor Institute for Teaching and Learning Guide Series.* Calgary, AB: Taylor Institute for Teaching and Learning at the University of Calgary, April 2016. http://www.ucalgary.ca/taylorinstitute/guides

Belenky, Clinchy, Goldberger, and Tarule: Women's Ways of Knowing

silence	identifying themselves as mindless, voiceless, and at the whim of external authority
received knowledge	believing themselves capable of receiving knowledge
subjective knowledge	believing themselves capable of intuiting knowledge
procedural knowledge	investing in pursuing knowledge
constructed knowledge	seeing themselves as producers and consumers of knowledge

Baxter Magolda's Epistemological Reflection Model: Awareness of What and How One Knows

absolute knowing	believing • knowledge is absolute or certain • their peers have limited knowledge, but should share materials • authorities have that absolute knowledge and should communicate it • evaluations (i.e., tests) are opportunities to show what they know by reproducing the authority's knowledge
transitional knowing	believing • transitional understanding, so some knowledge is certain, but there are limitations to what one can know • peers ought to exchange ideas • authorities have limited knowledge and should facilitate rapport with students • evaluations may focus on understanding rather than memorization
independent knowing	believing • knowledge is uncertain because all people have their own beliefs and can create knowledge • peers are now a source of knowledge • authorities promote independent thinking and exchange of opinions • evaluations reward independent thinking
contextual knowing	believing • knowing depends on analyzing contextually significant evidence, and they can merge their knowledge with others after this analysis • peers and authorities enhance learning through discussion and critique • evaluation can actually measure competence as students and teachers work toward shared goals

From a Canadian study done by D. Bateman and J. Donald called, *Measuring the Intellectual Development of College Students: Testing a Theoretical Framework*, they found that rather than the stages of development there are two possible levels or positions that students take.

1. Knowledge consists of facts and data and instructors supply them.

2. Knowledge is a quest in which students have responsibility for their own learning and are expected to be able to judge the validity of arguments, and to identify and defend their own point of view.

King and Kitchener's Reflective Judgment Model: Ways of Thinking about Problem Solving

pre-reflective thinking stages 1-3	learners believe that knowledge is absolute and derived from experience, so they have difficulty evaluating competing claims and making decisions to solve problems
quasi-reflective thinking stages 4 and 5	learners describe knowledge in self-centered, subjective ways and are limited in their abilities to resolve problems
reflective thinking stages 6 and 7	learners recognize knowledge as constructed and are able to integrate perspectives to draw and make decisions for problem-solving

Teaching to Support Student's Intellectual Growth

Students need different kinds of classroom structures to support movement from one stage to the next. Students in dualism need courses that open their awareness of questions that are unanswered or unanswerable. Students in multiplicity need exposure to and practice with the constructs of how to make decisions within the discipline. Students in contextual relativism need to see examples of different frameworks and paradigms blending together, shifting and changing.

Research tends to find that most students are in dualism or multiplicity stages (or related states of development per other perspectives and researchers) when they graduate secondary school and enter post-secondary education - with higher achieving students further along in contextual relativism.

When first year students push back on active learning strategies or activities that ask them to be creators of knowledge or develop new ideas, it is often because they are still thinking their role is as a 'recipient' (receiver) of knowledge and are not developmentally up to the task yet. Students need guidance, explanation, and a building of trust to try out new ways of thinking and learning. Here are some thoughts on helping students develop critical thinking and reasoning.

Dualism to Multiplicity	Multiplicity to Contextual Relativism	Contextual Relativism to Commitment to Relativism
- Present conflicting points of view - Acknowledge that conflicting points of view can be legitimate - Require students to give explicit, concrete reasons to reject alternative points of view - Ask for conditions that might cause students to change their minds - Give test questions that don't require memorization - Present one concept in multiple ways with the textbook being one perspective - Invite guest speakers, other instructors or past students in to share variety of ways of understanding - Demonstrate there is more than one way to solve a problem and all ways are 'correct' - Give students choice in projects and test questions to show that you can achieve the learning outcome in many ways	- Introduce non-absolute criteria for judging alternative options - Introduce disciplinary criteria for judging options, show variety of criteria that are possible - Engage in theory comparison and selection with ranking and judging - Have students build marking schemes and rubric like checklists to explore the variety of ways to determine what might be suitable acceptance of 'correct' - Engage students in a CPR (Calibrated Peer Review) exercise where you have sample assignments or papers from previous years (with no names) and students in groups have to figure out what mark or evaluation it would receive based on marking scheme and then defend choice - Have a debate – ask students to take on various sides and provide evidence for supporting the position	- Involve comparison of disciplinary paradigms, frameworks or perspectives in a single problem or situation - Provide models of flexible use of paradigms across disciplines - Study writings of innovators, scholars in the field, researchers and explore how they commit and defend their position or perspective - Discuss commitment to meaning-making in life and work - Engage students in building portfolios of their work with reflective summaries to explain what they did, why they did it and what they learned - Build more metacognitive learning aspects into your classes to support growth about self-regulation, self-directedness and confidence in skills - Ask students to create a plan for their learning in your course and assess its impact at end of course

References and Research Used to Develop This Handout

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