



The Why's and How's of the IE's Focus on Integration and Reflection

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We need reflection to develop complexity. We may start with a direct and sometimes relatively simple concrete experience, but that experience grows richer as we allow our brain the freedom to search for those unknown connections. And as we find those connections, our brain changes. We attach the networks of our present experience to those that represent our past experience. The art of directing and supporting reflection is part of the art of changing a brain. It is the art of leading a student toward comprehension.

(James E. Zull, 2002, *The Art of Changing the Brain*, p. 164)

In 2010, the University of Massachusetts Amherst implemented an upper-division General Education requirement, the [Integrative Experience \(IE\)](#), designed to provide a structured context for students to reflect on their own learning and explore the connections between the broad exposure provided by General Education and the more focused exposure of their major. The IE is intended to help students develop a deeper sense of their education, providing them with the opportunity to revisit General Education, explore the relevance of its learning objectives to their major(s) and rest of their college experience, and reflect on how their UMass Amherst education supports their own development and their goals for the future.

The Value of Integrative and Reflective Thinking

The literature on the science of learning, built upon fields like cognitive neuroscience, consistently identifies these twin, mutually reinforcing processes—reflection and integration—as essential elements of human cognitive processing. Our brains use these processes to take in and organize new information, connect (integrate) the new with existing information and experiences, and reformulate these connections to creating new (additional, more advanced) meaning. As such, reflection and integration are essential for fostering content mastery and deep learning (National Academy of Sciences, Engineering, and Medicine, 2018; National Research Council, 1999; National Research Council, 2001; Kuh, et. al., 2018; Zull, 2002).

Integrative and reflective thinking are also essential for fostering student metacognition (the process of reflecting on and directing one's own thinking) and self-directed learning (Ambrose, 2010; National Academy of Sciences, Engineering, and Medicine, 2018; National Research Council, 1999; National Research Council, 2001; Zull, 2002)

Metacognition...[is] a higher order thinking process, which involves the student actively taking control over his or her cognitive processes. In other words, when students reflect on a learning action they have recently performed, they are consciously revisiting the event. This is expected to result in more effective learning before proceeding to the next stage of learning. ...[T]he research literature seems to endorse that individuals demonstrating higher levels of metacognitive awareness and self-directed learning readiness are more likely to become successful independent learners. (McCarthy, 2013, p. 3)

As McCarthy's description suggests, metacognition is also essential for fostering mastery learning, where the learner is able to review and evaluate their own thinking, consider alternative approaches, and make changes/take action to adapt and improve their approach/their analysis/their thinking.

Because this emerging learning science research identifies the centrality of reflective and integrative thinking for advanced learning, these processes have received increasing emphasis in higher education in recent years. This emphasis includes a leading higher education association, Association for American Colleges and Universities (AAC&U), identifying integration as one of the Essential Learning Outcomes for all higher education graduates and the National Institute for Learning Outcomes Assessment (NILOA) identifying "periodic, structured opportunities to reflect and integrate learning" as one of the key features of well-executed High Impact Practices (HIPs) offerings (AACU, 2007, p. 3; NILOA, 2018, p.9).

The then AAC&U president further described the value of integrative learning (and by inference reflective learning), saying integrative learning is concerned with

...teaching a set of capacities—capacities we might also call the arts of connection, reflective judgement, and considered action—that enables graduates to put their knowledge to effective use....lead[ing] students to connect and integrate the different parts of their overall education, to connect learning with the world beyond the academic, and, above all, to translate their education to new contexts, new problems, new responsibilities. (Schneider, 2003, pp. 1-2, as quoted in Booth, 2011, p. 48)

As Schneider's emphasis on "teaching capacities" suggests, this focus on integrative and reflective learning also calls on higher educational institutions to build *intentional* opportunities for students to practice these types of thinking (Association of American Colleges and Universities (AACU), 2005; AACU and the Carnegie Foundation for the Advancement of Teaching, 2004; Huber & Hutchings, n.d.; Kinzie, 2013; Mahoney & Schamber, 2011; Peet, et. al., 2011; Rogers, 2001).

The Challenges of Teaching for Effective Integrative and Reflective Learning

It is important to keep *intentional* instruction and guidance in mind when working to facilitate students' integrative and reflective learning, because learners (especially novice learners) can easily be misdirected (Ambrose, et. al., 2010; Huba & Freed, 2000; Huber & Hutchings, n.d.; Lardner & Malnarich, 2009; Leonard, 2012; McCarthy, 2013; National Academy of Sciences, Engineering, and Medicine, 2018; National Research Council, 1999; National Research Council, 2001). While these processes are naturally occurring elements of the way our brains function, the practice of connection and reflection are not always effective or easy: "knowledge does not transfer very readily" from where/how it was developed beyond the limited context in which it was acquired (National Research Council, 2001, p. 87).

Prior learning, external stimuli, and other factors can either hamper or facilitate the effectiveness of these processes—leading to either unsophisticated and mis-directed learning, or (instead) learning for mastery and increased self-direction and meaning making.

The challenge is particularly intense when we are asking students to develop connections across quite disparate contexts (like connections between their early college learning and their current major, across learning and experiences in non-classroom contexts and experiences with more directly academic contexts, etc.). This is especially true for novice learners. As Ambrose and her colleagues describe:

Far transfer [when the learning contexts you want students to connect are dissimilar] is, arguably, the central goal of education: we want our students to be able to apply what they learn beyond the classroom. Yet most research has found that (a) transfer occurs neither often or automatically, and (b) the more dissimilar the learning and transfer contexts, the less likely successful transfer will occur. In other words, much as we would like them to, students often do not successfully apply relevant skills or knowledge in novel contexts [...] A little prompting....can go a long way in helping students apply what they know. (Ambrose et al, p. 108, p. 111)

Metacognitive processes are also challenging to develop:

To become self-directed learners, students must learn to monitor and adjust their approaches to learning. Learners may engage in a variety of metacognitive processes to monitor and control their learning...[including] evaluating their own strengths and weaknesses, planning their approach....and reflecting on the degree to which their current approach is working. Unfortunately, students tend not to engage in these processes naturally. When students develop the skills to engage these processes, they gain intellectual habits that not only improve their performance but also their effectiveness as learners. (Ambrose, pp. 6-7)

As is suggested in the excerpts provided above, students need direction, guidance, and structure to effectively use their powers of reflection and integration to develop mastery and self-directed learning. Ambrose writes:

Transfer does not happen easily or automatically. Thus it is particularly important that we ‘teach for transfer’—that is, we employ instructional strategies that reinforce a robust understanding of deep structures and underlying principles, provide sufficiently diverse context in which to apply these principles, and help students make appropriate connections between the knowledge and skills they possess and new contexts in which those skills apply. (Ambrose p. 111-112)

Through these methods, “[t]ransfer can be improved by helping students become more aware of themselves as learners who actively monitor their readiness for particular tests and performances. (National Research Council, 1999, p. 67)

And this is where the IE specifically makes its contribution to students’ advanced learning.

Achieving IE’s Purpose: Teaching for Effective Integrative and Reflective Learning

The task for the teacher is to help her students in this search [to unify their varied experiences]. But it is inherently private, and we cannot enforce it directly. Our work is to give assignments that require reflection and that induce learners to reflect on the right things. (Zull, p. 154)

The IE was introduced into the UMass Amherst undergraduate curriculum to provide an *intentional* and structured opportunity for students to connect the varied elements of their education and reflect on how the elements together contribute to their learning and development. The IE can also offer students the opportunity to reflect on their strengths and areas for improvement, on how their experiences have contributed to those strengths and exposed those aspects that need work, and help them to develop strategies for moving forward.

These are the teaching and learning opportunities the IE offers—to guide students towards effective reflective and integrative learning. Of course, this focus also represents a pedagogical challenge for IE instructors. Developing *intentional* assignments and activities that provide the “prompting” (Ambrose, et. al., p. 111) that will help students practice effective reflective and integrative thinking requires careful thought and some creativity.

However, as Ambrose and her colleagues indicate, the approach doesn’t always have to be elaborate—as they say, “a little prompting” can go a long way to fostering effective reflection and integration. UMass Amherst research has shown how even relatively simple “prompting” exercises like asking students to map their learning experiences can reap rich evidence of the kinds of connections students can make. Students’ reflections on these connections also offer evidence of the wide range of learning impacts such connections provide to students. ([Stassen, 2019](#)).

There are also a range of helpful examples of assignments and activities emerging from current IE offerings. Annotated examples from a range of IEs are available [here](#).

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