



Independent learning, the learning sciences and feedback: What have we learned from student failure?

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Introduction

In higher education, the construct of independent learning is widely regarded as a critical aspect to achieving higher levels of learning such as critical, creative and complex learning skills.

Beliefs about independent learning

Many of the beliefs about independent learning are encompassed in this quote by Simsek (2012):

... the rationale behind the concept of learner control is quite strong. Many educators suggest that learner control improves learners' involvement, motivation, mental investment, achievement, and attitudes toward learning. They claim that learner control provides learners freedom to select learning activities that suit their needs, expectations, and preferences. The idea is that informed learner control by motivated learners generally increases effectiveness, engagement, and efficiency of instruction. (n.p.)

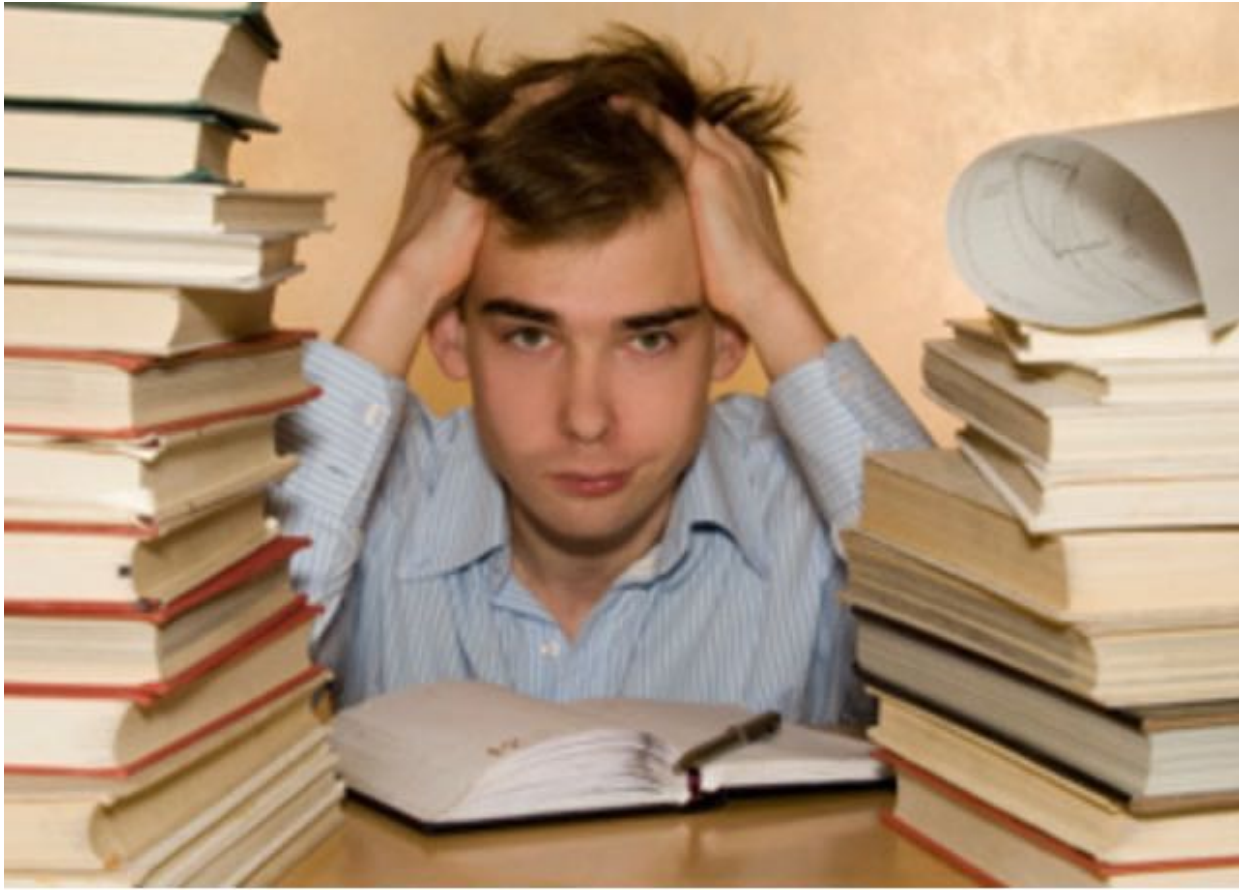


However...

... based on what we know from the learning sciences, there are a few underlying assumptions that render these approaches unrealistic and often unachievable:

1. Not all learners want to engage in self-directed projects.
2. Not all learners are capable of directing their own learning activities.
3. Few learners are equally effective at managing their learning across all subjects.





What do we know about independent learning?

Noticeably absent in much of the literature on independent learning within higher education is what we know about how the mind and brain works.

An important aspects to consider:

Cognitive overload.

Another problem which can also arise...

... is called conceptual disorientation that occurs when a learner loses sight of the task while exploring the content.

Early research on independent learning

The results of early studies (1980-90) showed that some learners' achievement was the same with control as without control but learners who were poor performers in the subject area learned the least (e.g., experienced failure).

These learners seemed to have two major deficiencies:

1. they failed to employ adequate review strategies and
2. they did not know how to manage their time

Also:

- Greater task engagement and attitudes but not greater achievement and sometimes led to worse performance

More recent studies?

The results are still in agreement with earlier research and none of the studies reviewed were in conflict.

A problematic and misguided assumption

A key assumption about independent learning is that the instructors' role, while recognized, should be minimized to guiding the learners, allowing learners a high degree of control (e.g., 'guide on the side').

A related assumption is that low levels of pedagogical control (e.g., student centred approaches) is necessary for the achievement of critical and creative thinking skills.

The research in the cognitive sciences tells us much about student failure, such as:

- Intrinsic load
- Split attention effect
- Extraneous load

Here's what we know:

- When a task is not overly complex there are likely to be few, if any, benefits of student-directed learning
- Students with little knowledge of the content do not perform as well under student-directed learning
- The less a student knows about a subject, the greater the need for instructional support – key to this is feedback

And with respect to feedback, we know:

- Academic feedback is more strongly and consistently related to achievement than any other teaching behaviour.
- This relationship is consistent regardless of grade, socioeconomic status, race, educational environment.
- When feedback and corrective procedures are used, most students can attain the same level of achievement as the top 20% of students.

We also know:

Instructors need to provide feedback that is:

- Timely
 - Frequent
 - Evenly distributed
 - Individualized and content specific
- (Crisp & Bonk, 2013)

However, research also reveals that the best kind of feedback involves a number of complex issues beyond these well known feedback dimensions

Research on feedback:

What we've learned from student failure

NF – no feedback

KCR – Knowledge of correct response

KIR – knowledge of incorrect response

KR – knowledge of response

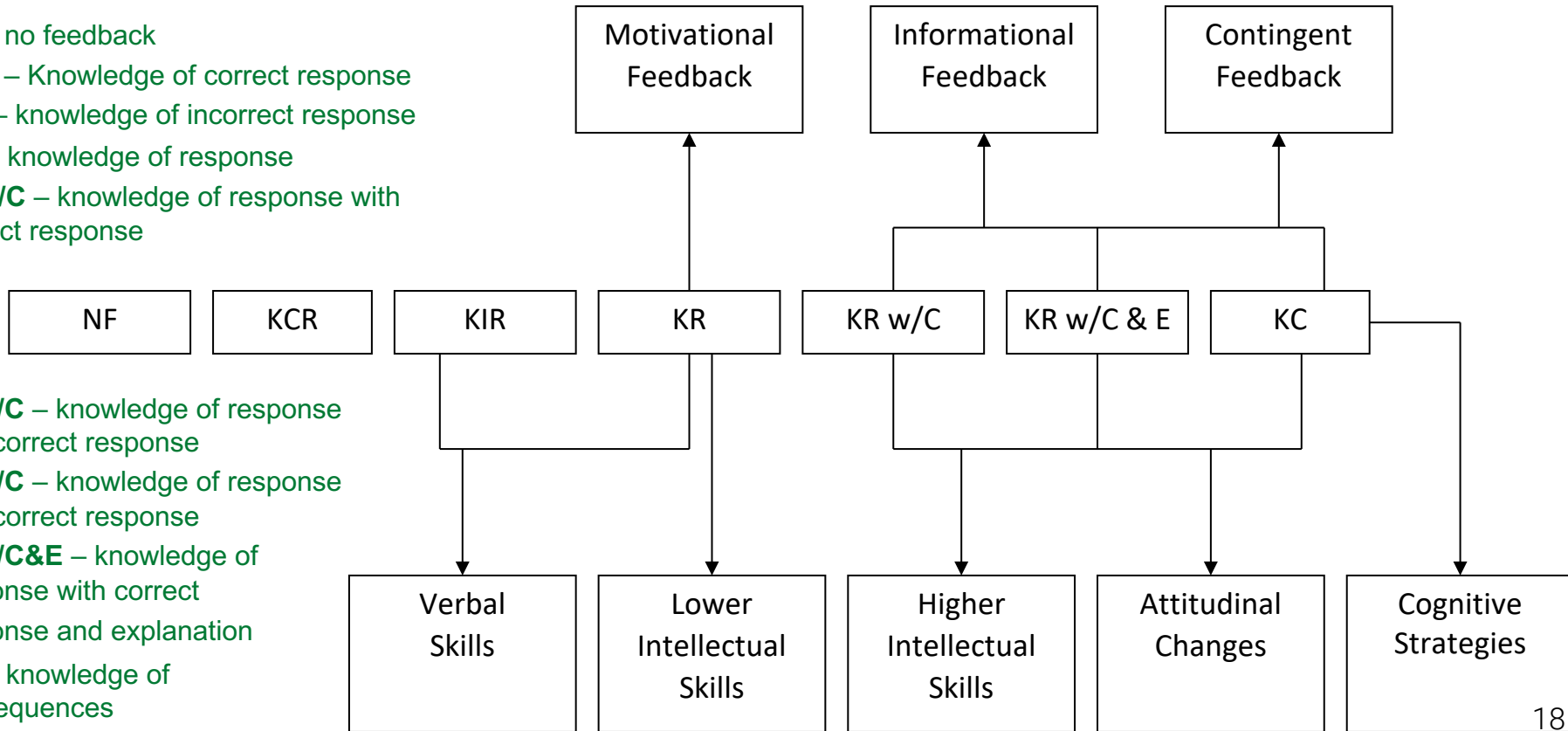
KRw/C – knowledge of response with correct response

KRw/C – knowledge of response with correct response

KRw/C – knowledge of response with correct response

KRw/C&E – knowledge of response with correct response and explanation

KC – knowledge of consequences



Other things we have learned from student failure...

Other research on feedback to consider:

- Immediate feedback
- Delayed feedback

Immediate feedback

With respect to student readiness:

- Low mastery – immediate feedback seems to facilitate instruction
- No prior knowledge of the subject matter – immediate feedback seems to be mandatory
- High mastery - immediate feedback can impede the pace of learning and be perceived as a deterrent (*KR)
- Immediate feedback has been shown to facilitate short-term retention and initial acquisition of material (*recognition/recall)
- End-of-session feedback seems to facilitate long-term retention, especially with high-mastery learners

In closing...

The unbridled enthusiasm for independent learning (e.g., student centred approaches) and its concomitant instructional methods (discovery learning, inquiry-based learning, experiential learning, constructivism, etc.) might feel good for both learners and instructors; however, there is little evidence that it facilitates critical and creative learning.

THANK YOU

Questions?