

Self-Determination Theory and student motivation

Excerpt from a Prewrite Reading document prepared for the 2017 KEEN Retreat and Workshop held at University of St. Thomas School of Engineering

Doug Dunston
doug.dunston@stthomas.edu

Self-Determination Theory

One active research area in educational psychology that seems to dovetail particularly well with our interest in supporting and sustaining our students' curiosity is Self-Determination Theory (SDT), a theory of motivation introduced by psychologists Richard M. Ryan and Edward L. Deci. SDT is also being explored in undergraduate engineering education studies by some of our KEEN network partners, including Jonathan Stolk and others at Olin College. SDT features robust and broad findings that may provide a helpful framework for our continuing exploration and practical experimentation with EML.

SDT lays out a taxonomy of “regulatory styles.” One concise form of the taxonomy includes the following four regulatory styles of motivation [1]:

- **Amotivation** – the lack of motivation to engage and no perception of relevance
- **Extrinsic regulation** – “when behavior is regulated by rewards or in order to avoid negative consequences”
- **Identified regulation** – “occurs when a behavior is valued and perceived as being chosen by oneself...as a means to an end”
- **Intrinsic motivation** – “behaviors that are engaged in for their own sake”

The taxonomy is not an index of development, as travel along the spectrum does not necessarily proceed in one direction:

A person might originally get exposed to an activity because of an external regulation (e.g., a reward), and (if the reward is not perceived as too controlling) such exposure might allow the person to experience the activity's intrinsically interesting properties, resulting in an orientation shift. Or a person who has identified with the value of an activity might lose that sense of value under a controlling mentor and move "backward" into an external regulatory mode. Thus, while there are predictable reasons for movement between orientations, there is no necessary "sequence" [2].

Ryan and Deci functionally define three specific "basic psychological needs," which they propose can lead to "enhancement of intrinsic motivation, internalization and integration, and individual and social wellness and vitality" when supported and satisfied [3]:

- **Autonomy** "refers to feeling willingness and volition with respect to one's behaviors...The need for autonomy describes the need of individual to experience self-endorsement and ownership of their actions—to be self-regulating in the technical sense of that term. The opposite of autonomy is heteronomy, as when one acts out of internal or external pressures that are experienced as controlling. Autonomy does *not*, as we use it, refer to independence."
- **Competence** "refers to feeling effective in one's interactions with the social environment—that is, experiencing opportunities and supports for the exercise, expansion, and expression of one's capacities and talents."
- **Relatedness** "refers to both experiencing others as responsive and sensitive and being able to be responsive and sensitive to them—that is, feeling connected and involved with others and having a sense of belonging."

SDT is "specifically framed in terms of social and environmental factors that *facilitate* versus *undermine* intrinsic motivation. This language reflects the assumption that intrinsic motivation, being an inherent organismic propensity, is catalyzed (rather than *caused*) when individuals are in conditions that conduce toward its expression" [2: p.58].

Significantly, extrinsic reward systems appear fundamentally unable to catalyze intrinsic motivation, whereas the presence of autonomy support (e.g. in the forms of choice or self-direction) can enhance it:

Although the issue of rewards has been hotly debated, a recent meta-analysis...confirms that virtually every type of expected tangible reward made contingent on task performance does, in fact, undermine intrinsic motivation. Furthermore, not only tangible rewards, but also threats...deadlines...directives...and competition pressure...diminish intrinsic motivation because, according to CET [Cognitive Evaluation Theory, a component theory of SDT], people experience them as controllers of their behavior. On the other hand, choice and the

opportunity for self-direction...appear to enhance intrinsic motivation, as they afford a greater sense of autonomy [2: p. 59].

Beyond catalyzing intrinsic motivation in activities that are already intrinsically interesting to an individual, the support and satisfaction of students' basic psychological needs correlate with positive shifts along the continuum from amotivation-to-intrinsic motivation continuum, although Ryan and Deci caution that reaching the regulation style of intrinsic motivation, characterized by immersive enjoyment, is not a given [3: p. 198].

It is possible that curiosity plays a mediating role between regulating styles, particularly between identified regulation (choosing to engage an activity as a means to an end) and intrinsic motivation (engaging the activity for its own sake). Stolk relates (J. Stolk, personal communication, April 7, 2017) that the relationship between curiosity and intrinsic motivation has not yet been studied extensively, however, particularly in the area of translating curiosity-oriented research into practice.

In the absence of such established research, our work on curiosity in undergraduate engineering education may provide clues on how to leverage the relatively large corpus of SDT research and the pedagogical explorations of our KEEN partner universities to realize our Transformation Machine goals.

Expanding the Possible: Autonomy Support

When designing course activities for students that offer “choice and opportunity for self-direction...afford[ing] a greater sense of autonomy,” an instructor holds in mind multiple stakeholders and constraints, including, but not limited to:

- Students' developmental and knowledge levels
- How the activities are intended to contribute to the course objectives
- How the work in the course is intended to contribute to the engineering curriculum
- The size of the group and the instructor's facilitative experience
- Time available for planning, running, and following up on the activities

Many dimensions of choice and self-direction can be made available to students, allowing instructors to design in autonomy-supporting freedom while still providing structure and guidance. It is not necessary to relinquish course objectives in a “free for all” in order to allow for student choice, and the “ambiguity shock” students can experience if suddenly presented with too much choice can be overwhelming and counterproductive. Instead, as students' confidence in navigating choice grows, it is possible to gradually provide more opportunity for student self-direction.

Stolk's “Student Autonomy Breakdown” can help instructors find and select aspects of activities for which it could make sense to delegate authority or control to students (J. Stolk, personal conversation, April 19, 2017). The categories include:

- Learning goals
- Course content
- Learning strategies
- Products, deliverables
- Applications, context
- Grading, evaluation
- Due dates, schedule
- Team roles & structure
- Resources
- Physical space

Considering which of these aspects could reasonably and productively be opened to student determination in an activity can be a direct way for instructors to begin exploring student autonomy support.

The “Situational Motivation Scale” (SIMS) is a 16-question, Likert scale instrument instrument that only takes a few minutes to administer and that can provide a “quick read” on students’ motivational state in conjunction with an activity [1]. Stolk and his colleagues have created a straightforward method for visually translating SIMS data so they can be interpreted rapidly. Additional instruments are available that could conceivably be applied on larger time scales (e.g. each year) to start building a picture of student experience over the course of their undergraduate years; application of these tools would not directly impact individual course design or delivery but could provide another form of informative feedback to instructors to aid in course development.

The Recursive Nature of Autonomy Support

The autonomy support that instructors themselves receive has a significant effect on how effectively those instructors can support the autonomy of their students, both immediately and over the long term:

[Researchers] suggested that teachers experience pressure from above (e.g., from accountability standards) and also from below (e.g., from students who are inattentive and unengaged).... In sum, this set of studies provides confirmation that teachers do require satisfaction of the basic psychological needs [autonomy, competence, relatedness] and that when the needs are frustrated by thwarting environmental pressures, whether from “above” or “below,” the teachers will tend to be more controlling with their students and will also be more likely to experience burnout [3: p. 375].

In the effort to satisfy basic psychological needs, the School of Engineering is very well-positioned to support its faculty to in turn support their students. Stolk suggests that a combination of Tools, Choice, and Trust is necessary for a faculty to thrive and teach in a sustainable way [4]:

- Tools - Faculty are provided with “real tools,” i.e. what they need to be creative in the classroom. There are people available who can equip the faculty with pedagogical tools.
- Choice - Faculty experience “real choice” when it comes to scheduling, space, content, and pedagogical approaches. There is an expectation and a welcoming of experimentation in teaching.
- Trust - There is an environment of mutual trust.

References

- [1] F. Guay, R. Vallerand, C. Blanchard, "On the Assessment of Situational Intrinsic and Extrinsic Motivation: The Situational Motivation Scale (SIMS)," *Motivation and Emotion*, vol. 24, no. 3, pp. 177-213, 2000.
- [2] R. Ryan and E. Deci, "Intrinsic and extrinsic motivations: Classic definitions and new directions," *Contemporary Educational Psychology*, vol. 25, pp. 54-67, 2000.
- [3] R. Ryan and E. Deci, *Self-determination theory*. New York: Guilford Press, 2017, pp. 80,86.
- [4] NewsMedia UFM. (2013, Dec. 9). Jonathan Stolk and Robert Martello: Intrinsic motivation. [YouTube video]. Available: <https://www.youtube.com/watch?v=EqAlj3XZjjY>. Accessed May 12, 2017.