By Developing Interest Educators Can Motivate Learning

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Abstract

The major premise of this article is that interest development is critical for students' motivation and learning. First, we briefly review Svinicki's (2016) IDEA paper #59, the most recent consideration of motivation and learning in this series. In it, she focused on three motivational theories (expectancy value, goal orientation, and self-determination) and then identified related motivational strategies for classroom use. Following this, we point to differences between these theories and interest development. Whereas students' consciously formulated beliefs and perspectives are central to the theories reviewed, they are not essential to the conceptualization of interest as a cognitive and motivational variable. We describe characteristics of interest, the Four Phase Model of Interest Development, and implications from research on interest development for motivating students and classroom practice.

Keywords: interest, interest development, motivation, expectancy value, goal orientation, self-determination

By Developing Interest Educators Can Motivate Learning

In this article, we argue that the Four Phase Model of Interest Development (Hidi & Renninger, 2006) provides a basis for motivating learning, and we describe ways in which educators can support interest development. Interest is a critical factor for engagement and reengagement (Renninger & Hidi, 2020). For example, research shows that when undergraduate students' interest is triggered by the content of the lectures they are attending, not only do they improve their performance, but they also are likely to re-enroll in related courses over as many as seven terms (e.g., Harackiewicz, Barron, Tauer, and Elliot, 2002; Harackiewicz, Durik, Barron, Linnenbrink, & Tauer, 2008). Triggers for interest initiate engagement, and provide the basis for the seeking behavior characteristic of developing interest. Such triggers for interest in the lecture context might include: personal anecdotes, fun facts, novel, well-organized and clear information (e.g., Palmer, Dixon, & Archer, 2016).

We start by overviewing points made by Svinicki (2016) in her IDEA paper #59, Motivation: An Updated Analysis. In it, she extended Cashin's (1979) description of the importance of student motivation which he laid out in the very first IDEA paper. Svinicki focused her review on three motivational theories: expectancy value theory (e.g., Eccles & Wigfield, 2002), goal orientation theory (e.g., Elliot & Harackiewicz, 1996), and self-determination theory (e.g. Ryan & Deci, 2000).

Following a short description of each, she suggested strategies for their implementation in classrooms.

First, Svinicki explained that Expectancy Value Theory (e.g., Eccles & Wigfield, 2002)[1] focuses on students beliefs about whether they can succeed in an activity and their perceived value about performing the activity; in other words, students' ask themselves: "Can I be successful at this task?" and "Is my effort worth it?" and their answers are based on their beliefs. Svinicki proposed strategies for enhancing expectancy of success such as revisiting past success, or pointing to similar learners who have been successful. She also listed strategies that could increase learners' perceptions of value.

Second, in discussing Goal Orientation Theory (e.g., Elliot & Harackiewicz, 1996), Svinicki explained that there are different types of goals on which students may focus, and that each reflects a different perception of success and corresponding behavior. The most researched goals include mastery goals (focused on learning, including a willingness to take risks and openness to feedback), performance approach goals (focused on demonstrating competence, and being better at a task than others), and performance avoidance goals (focused on avoiding appearing incompetent, and fear of making mistakes). She observed that the goals students adopt are conscious and may vary based on the situation. Considering mastery goals the most beneficial, Svinicki suggested strategies for supporting students that include providing a safe and supportive classroom environment. She also proposed that when students need to develop skills (e.g., writing, problem solving), emphasis should be placed on personal attainment rather than comparison with others.

Finally, Svinicki described Self-determination Theory (SDT; e.g., Ryan & Deci, 2000) in which students who are motivated to learn are characterized as feeling competent, belonging (social-relatedness), and in control of their learning (have autonomy). That is, students are described as having psychological needs for competence, social relatedness, and autonomy. One of Svinicki's suggestions for supporting competence was to provide a learning environment that enables learners to feel successful. In order to foster belongingness, she recommended facilitating well-functioning group work that can provide for shared history and culture. In order to support autonomy, she encouraged instructors to empower students to make decisions, allowing them to determine what topics need further discussion and/or the timeframe for assignments.

Svinicki explained that her purpose was to provide sufficient information about the three theories so that educators would know how they could increase students' motivation and learning. She suggested that "learners' beliefs and interpretations of what is happening that make something motivating" (p. 1). To further demonstrate this point, Svinicki provided an example of how one student might view receiving corrective feedback as demotivating (i.e., as criticism), whereas another student could understand the feedback as an impetus for trying harder to perform. Svinicki concluded that it is the learners' perspective that results in motivation or in the lack of it. We suggest, however, that interest provides an essential basis for student motivation that educators are in a position to promote.

Interest and Its Characteristics

Ours is a different view of motivation, one in which motivation is not driven by learners' beliefs. We certainly acknowledge that learners have beliefs, including beliefs about interest; however, we argue that conceptualized and assessed as a cognitive and motivational variable that can develop, interest provides a foundation for supporting students to do so. As such, students' level of existing interest

can influence how they perceive a particular situation. Considering the example that Svinicki provides about feedback, we suggest that if students are interested in a task, they are more likely to positively respond to corrective feedback than when such interest does not exist.

For example, in their study of interest and writing, Lipstein and Renninger (2007) reported that most students do want feedback, but the type of feedback that they are ready to work with has a lot to do with how interested they are in the writing that they are working on. If students are working on getting a paper written, and really have little interest in writing, they will work most effectively with brief feedback that first acknowledges what they are trying to do and something simple that they can focus on doing. If, on the other hand, students are really interested in writing (not just acting interested because of good manners, or having the intention of getting a higher grade), and want to revise what they are working on, feedback for them would ideally not only acknowledge specific strengths, but would include detailed suggestions that relate to what they are trying to do.

There are five characteristics of interest that do not necessarily characterize other motivational variables (Renninger & Hidi, 2011). These are that interest:

- has a biological basis,
- is always content specific,
- has three components: knowledge, feelings, and value
- is not simply conscious involvement, and
- exists in the interaction of the person and the environment.

Interest Has A Biological Basis

Neuroscientific findings clarify that interest and curiosity[2] differ from other motivational variables such as expectancy, goals, and self-determination in that they involve seeking behavior and are associated with activation of the reward circuitry (e.g., Ainley & Hidi, 2014; Panksepp, 1998). This means that both variables have a biological basis. In other words, all mammals including humans are "hard-wired" to search for information, such search itself is rewarding.

More specifically, neuroscientists have demonstrated that information search is associated with the activation of the reward circuitry of the brain (e.g., Gottlieb, Oudeyer, Lopes, & Baranes, 2013; Gruber, Gelman, & Ranganath, 2014; Kang, Hsu, Krajbich, Lowewenstein, McClure, et al., 2009). It has been shown that activation of the reward circuitry improves attention (Anderson, Laurent, & Yantis, 2011), enhances memory (Adcock, Thangavel, Withfield-Gabrieli, Knutson, & Gabrieli, 2006; Murayama & Kitagami, 2013), and is energizing (Bunzec, Doeller, Fuentemilla, Dolan, & Duzel, 2009). Findings such as these indicate that interest may be triggered, sustained, and developed for all students— including college students— in any subject matter, regardless of what their previous experiences have been with that discipline (see Renninger, Bachrach, & Hidi, 2019 for more detail).

Interest is Always Content Specific

Interest is always content specific. This explains why students may have less interest in one subject, and more in another. It is important to recognize that the same student is likely to have different levels of interest in various subjects, and also that because interest has a biological basis this situation can be changed. In fact, educators are in prime positions to support students to develop their interest (e.g.,

Alexander, et al., 2019; Xu, Coats, & Davidson, 2012), and as Xu, et. al (2012) noted, educator interest in subject matter and in their students' learning of the subject matter is critical to their motivation and learning.

Interest Has Three Components: Knowledge, Feelings, and Value[3]

Interest includes three components: knowledge, feelings, and value. These are coordinated in their development, although the prevalence of each varies. Early in the development of interest, when a student is just beginning to make connections to the content to be learned, feelings and value may dominate, whereas later in the development of interest when connections to content continue to deepen, knowledge and its coordination with value does. As such, interest is neither just a cognitive, nor just an affective motivational variable.

Interest Is Not Simply Conscious Involvement[4]

Interest is both a psychological state and a process of engaging, or participating; it describes behavior, it is not simply a conscious belief. A major difference between interest and other motivational variables such expectancies, goals, or competence, and/or the need to feel autonomy, maybe the fact that interest is not simply conscious involvement. To reiterate, whereas interest is a particular psychological state that involves active information search, a belief is a cognitive concept that is not necessarily linked to either a psychological state or information search. There are many beliefs that student hold. They are stored and may or may not impact their behavior. Beliefs are only energizing if there is a need to defend or support the belief for some reason. Engaging in an activity that is of interest, on the other hand, is always energizing and can engage you in information search without that being a conscious intention. If educators promote the development of interest, they are supporting meaningful engagement that involves information search, questioning, receptivity to feedback and instruction, as well as positive affect. When interest development is encouraged, students' abilities to make and deepen their connections to content are supported.

Interest Exists in the Interaction of the Person and the Environment

Interest may be supported to develop through the interactions that students have with their environment. Rather than considering this to be a one-sided proposition—how the learner perceives the environment—we suggest that educators might want to recognize that interest can be supported to develop in all subject areas (for a review of interest in different subjects, see Renninger, Talian, & Kern, in press). Educators can make a difference by encouraging students to make their own meaningful connections to content to be learned. They should be forewarned that the engagement of students in the earlier phases of interest at first may be dominated by their feelings and value and only later shift to include voluntary and independent information search that is content related. In the earlier phases of interest development, extrinsic motivators may play an important role in supporting continued engagement. In later phases, however, extrinsic motivators are not required for students to continue to pursue their activity. As such, encouraging the development of interest may include providing students with projects and tasks that feel rewarding because they engage them meaningfully with content, even when the students do not yet believe that they are able to be successful in doing so.

The Four-Phase Model of Interest Development

Hidi and Renninger (2006) described the four phases in the development of interest as including: triggered situational, maintained situational, emerging individual, and well-developed individual interest (see Table 1 on page 5). Briefly, triggered situational interest, the first phase of interest

Table 1:

	Phases of Interest Development			
	Less-Developed (Earlier)		More-Developed (Later)	
	Phase I: Triggered Situational Interest	**Phase 2:** Maintained Situational Interest	**Phase 3:** Emerging Individual Interest	**Phase 4:** Well-Developed Individual Interest
Definition	• Psychological state resulting from short-term changes in cognitive and affective processing associated with a particular class of content	• Psychological state that involves focused attention to a particular class of content that reoccurs and/or persists over time	• Psychological state *and* the beginning of relatively enduring predisposition to seek reengagement with a particular class of content over time	• Psychological state *and* a relatively enduring predisposition to reengage a particular class of content over time
Learner Characteristics	• Attends to content, if only fleetingly • May or may not be reflectively aware of the experience • May need support to engage from others and through instructional design • May experience either positive or negative feelings • May not persevere when with confronted with difficulty • May simply want to be told what to do	• Reengages content that previously triggered attention • Is developing knowledge of content • Is developing a sense of the content's value • Is likely to be able to be supported by others to find connections to content based on existing skills, knowledge, and/or prior experience • Is likely to have positive feelings •May not persevere when with confronted with difficulty • May want to be told what to do	• Is likely to independently re-engage content • Has stored knowledge and stored value • Is reflective about the content • Is focused on their own questions • Has positive feelings • May not persevere when with confronted with difficulty • May not want feedback from others	• Independently reengages content • Has stored knowledge and value • Is reflective about the content • Is likely to recognize others' contributions to the discipline • Self-regulates easily to reframe questions and seek answers • Has positive feelings • Can persevere through frustration and challenge in order to meet goals • Appreciates and may actively seek feedback

The Four Phases of Interest Development (Hidi & Renninger, 2006): Definitions and Learner Characteristics, Revised. From The Power of Interest for Motivation and Engagement by K. A. Renninger & S. E. Hidi, 2016, Table 1.2, p13. Copyright by Taylor and Francis, reprinted with permission.

development, describes the phase in which a student's attention is initially activated, or triggered. The triggering of interest may be serendipitous or facilitated by others. For example, instructors may trigger student interest by inserting novelty or surprise into demonstrations or lab assignments (Nieswandt & Horwitz, 2015), personalizing content (e.g., Bernacki & Walkington, 2018; Walkington & Bernacki, 2015), and supporting students to attend to self-related information such as utility, the usefulness of the topic being learned (e.g., Harackiewicz, Smith, & Priniski 2016; Hecht, Grande, & Harackiewicz, 2020; see Hidi, Renninger, & Northoff, 2019), or reflect on critical elements of the activity (e.g., Renninger, Austin, Bachrach, Chau, Emmerson, et al., 2014). In terms of feedback on their work, however, students with a triggered situational interest do not have much if any connection to the content and are often concerned about criticism; as such, they are likely to want comments that require few changes and feel manageable (Lipstein & Renninger, 2007).

Support to re-engage with content may enable students to shift to a maintained situational interest, the second phase of interest development. When students' interest shift to become a maintained situational interest, their feelings tend to be positive, their knowledge and value for content have begun to develop, and they may even begin to work with the content independently. Activities such as hands-on projects, working in groups with other people, and games have all been found to support the transition from triggered to a maintained situational interest (e.g., Mitchell, 1993; Swarat, Ortony, & Revelle, 2012). For students who have a maintained situational interest, feedback is most welcome when it is positive and includes specific directions about how to improve their work; students in this phase of interest look to teacher for standards for performance (Lipstein & Renninger, 2007).

As students begin to independently seek additional information about their interest, and work to create their own opportunities for doing so, their phase of interest shifts to become an emerging individual interest. They can be supported in their searching by the encouragement to take time to explore, and opportunities to think with others who already have developed an understanding (Azevedo, 2006; Nolen, 2007a, b; Xu, et al., 2012). In this phase of interest, students' feelings about the content continue to be positive, even if they encounter difficulties that result in negative emotions (see Fulmer & Frijters, 2011; O'Keefe & Linnenbrink-Garcia, 2014). Students with an emerging individual interest may not want feedback that provides specific directives or questioning of their decision making. They prefer their ideas to be heard and to have their work appreciated. They often do best with feedback that acknowledges their ideas and provides them with opportunities to continue to explore their understanding (Lipstein & Renninger, 2007).

The continued development of interest into a well-developed individual interest, the fourth phase of interest development, is primarily self-generated. In this phase of interest, students are typically committed to deepening their understanding of content, and they are voluntarily involved in ongoing information search. Their experience of interest is positive and they persevere through failed experimentation, for example, recognizing that they are continuing to learn (Neumann, 2006). Instructional conditions and/or the conditions of online connectivity may lead them to seek clarification, resolution, and or/deeper understanding (e.g., Azevedo, 2006, 2013 a, b; Barron, Gomez, Pinkard, & Martin, 2014; Ito, Baumer, Bittanti, boyd, Cody, et al., 2010). Students who have a well-developed interest want honest feedback in any form, especially if it is constructive criticism; they also tend to prefer initial feedback on content, followed by feedback about technique (Lipstein & Renninger, 2007).

To summarize, as students' interest in some content continues to develop and deepen, they are more likely to re-engage that content to seek information. In the earlier phases of interest development (triggered situational and maintained situational interest), students often need support to make connections to the content on which they are working. That is, they need assistance to know how to engage with the content and they may need to be rewarded for meaningful engagement. Rewards can be verbal, such as positive feedback about some aspect of the work undertaken. In the later phases of interest development (emerging individual and well-developed individual interest), students have developed enough connections to the content, have begun to generate questions that they want to answer, and their pursuit of information activates the reward circuitry. For them their interest in this content has become its own reward, and they may not need external rewards. This does not suggest that external rewards such as verbal feedback or praise are not appreciated, but rather that students who have more developed interest are likely to continue their engagement without external reward.

Implications of Research on Interest Development for the Classroom

A key strategy for enabling students to develop their interest involves helping them to make connections between what they already know and new information (Renniger & Hidi, 2016, 2019). This support can be promoted by the design and tasks of the environment as well as through their interactions with other people. As Nieswandt and Horowitz (2015) report, however, interest is more likely to be triggered and sustained if students have some basic knowledge of the content to be learned. For those who are new to subject matter, or who "believe" that they cannot engage it, encouragement to find connections to it are essential. When such connections are identified, they can be powerful because they typically lead students to ask questions and seek information on their own.

Crouch, Wisittanawat, Cai, and Renninger (2018) reported on using life science content as the examples in demonstrations, laboratory work, and homework for an introductory college-level physics course for life science students. At the end of the course, students who had little interest in physics at the start of the course performed at the same level as those who had had a more developed interest when the course began. In addition, those with less developed interest were supported to develop their interest in physics. In describing interview data from this study, Renninger and Hidi (2019) reported that students with less developed interest explained that the life science triggers enabled them to make meaningful connections to physics. Those with more developed interest described the life science triggers as deepening their connections to the physics they were learning as long as they did not already know the information. In other words, these findings suggest that when students already know something, it is not interesting to them to revisit that information in exactly the same way. For interest to continue to develop and deepen, learners need to continue to stretch what they know- to continue to ask questions and search for information.

Educators are key: they plan and design instruction, and the types of decisions that they make are critical (e.g., Xu, et al., 2012). Interest can be triggered in many different ways (see Renninger, Bachrach, & Hidi, 2019). Whether they use demonstrations, lectures, or project-based learning, educators can make the content of instruction meaningful by including complexity, novelty, surprise, and/or questions (e.g., asking students to share what they notice, and on hearing about others' observations, to ask questions, see Ray-Riek, 2013) in their teaching (Pressick-Kilborn, 2015), In addition,

educators can rely on students generally being interested in other living things (Glynn, Bryan, Brickman, & Armstrong, 2015) and authentic situations (Nieswandt & Horowitz, 2015), including opportunities to meet people in careers related to the subject matter they are studying (e.g., scientists) who talk with them about their work (Ainley & Ainley, 2015). Culturally-relevant texts can be used to encourage students to make and sustain meaningful associations with content (e.g., Clark, 2017).

Yet another strategy involves leading students to make self-related, or self-specific, connections to content (Hidi, Renninger, & Northoff 2018, 2019). Utility-value, or relevance, interventions are examples of a self-specific strategy that encourages students to identify the value of a given experience (e.g., doing mathematics) for themselves (e.g., Canning & Harackiewicz, 2019; Harackiewicz, et al., 2014; Hulleman, Kosovich, Barron, & Daniel, 2017). The interventions are informed by situated expectancy-value theory and they typically involve students writing (e.g., Canning & Harackiewicz, 2019) or working with scenarios (Gaspard, Dicke, Flunger, Brisson, Hafner, et al., 2015) that are designed to lead them to make links between themseleves and the content to be learned. Improved performance, as well as, increased value and interest for content have been reported, especially for populations at-risk for school success.[5]

There are many strategies that can be used to support students to make connections to the content being taught; however students also need to continue to reengage with content in order to consolidate their developing understanding of it. They need repeated and varied opportunities to continue to engage with the content (e.g., Clark, 2017; Renninger & Hidi, 2019; Xu, et al., 2012). Practice that feels meaningful (and not rote) is essential. For example, in her study of different "doses" of culturally relevant texts, Clark (2017) reported that any opportunities for readers to work with culturally relevant texts were beneficial, however students who worked continually with culturally relevant texts benefitted the most.

We have argued that motivating learning by developing interest is important—whether this is undertaken using culturally relevant text, life science examples to provide context for learning physics, or providing feedback that acknowledges what students are trying to do and helping them to think about corrective information as supporting them. More specifically, educators have an essential role to play in supporting students' interest to develop. We propose that promoting interest development provides added value to Svinicki's (2016) suggestions for motivating students. Task interest has been shown to develop first in studies of expectancy-value (Wigfield & Cambria, 2010). Goals have been shown to be reciprocally related to interest development, and changes in goals have been show to impact subsequent engagement (e.g., Harackiewicz, et al., 2008). We note that that the relation among interest and psychological needs is also reciprocal. On the one hand, interest may result in the development of a sense of competence and being autonomous, and, on the other hand, interest may also be an outcome of a sense of competence and autonomy (Renninger & Hidi, 2011). When students have begun to develop an interest in what they are learning, they are focused on meaning-making and participating. This is the goal. If interest is supported to develop, students' expectancies for success will be met, or seen as within reach. As students' interest develops, they will begin setting goals that can be expected to result in both information search out of interest, and achievement. They are also likely to feel competent and to feel that they "belong" in the discipline, as well as that they are in control of their activity. As Renninger and Hidi (2020) have argued, by promoting interest development it is possible to support the motivation and learning of all students.

Author Biographies

Suzanne E. Hidi is an Adjunct Professor of Educational Psychology at the Ontario Institute for Studies in Education, the University of Toronto. She holds a PhD in Educational Psychology from the University of Toronto, Toronto, ON, Canada. Her early work addressed academic writing, attention and text processing. Her studies informed her conceptualization and subsequent study of situational interest. Her current research interests are in the area of motivation and neuroscience and how findings from these two fields could be integrated. She is a co-editor of the American Educational Research Association volume, Interest in Mathematics and Science Learning (AERA, 2015) and of the Cambridge Handbook on Motivation and Learning (Cambridge University Press, 2019). Her paper co-authored with K. Ann Renninger on the Four-Phase Model of Interest Development (2006) was a basis of their recently published book, The Power of Interest for Motivation and Engagement (Routledge, 2016). Most recently, she was a co-editor of a special issue for Educational Psychology Review focused on the conceptual distinctions, relations and implications of curiosity and interest for educational practice.
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