Situational interest and learning: Thirst for knowledge

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1. Introduction

The close connection between interest and learning is by many seen as self-evident; the more interest a student has in a particular topic, the more willing he or she is to learn about that topic (Schiefele, 1991; Schraw, Flowerday, & Lehman, 2001). Alternatively, those who have little interest in a discipline, tend to learn less. It is generally assumed that interest is a motivational force in learning: it induces learners to persist with a task, even if it is a difficult one; it focuses their attention on the task, and it produces positive affect regarding the task and the result of this is learning (Ainley, Hidi, & Berndoff, 2002; Durik & Harackiewicz, 2007; Harackiewicz, Durik, Barron, Linnenbrink-Garcia, & Tauer, 2008; Hidi, 2006; Hidi & Renninger, 2006; Schraw & Lehman, 2001; Schraw, Bruning, & Svoboda, 1995; Schraw et al., 2001; Tobias, 1994).

The prototypical example is learning a new computer game. Many children are interested in gaming, and even if the game is difficult to master, they would immerse themselves in the game, persist for long hours and indicate enjoyment. Some even contend that interest and learning reinforce each other: interest leads to an increase in knowledge, which, in turn, leads to an increase in interest (Alexander, Jetton, & Kulikowich, 1995; Alexander, Kulikowich, & Jetton, 1994a; Bergin, 1999; Kintsch, 1980; Schraw et al., 2001; Tobias, 1994). This would explain the common observation that those who have much knowledge about a topic—say soccer or lunar travel—tend to be highly interested in that topic as well. This type of interest is often referred to as individual interest (Hidi, 2006; Renninger, Ewen, & Lasher, 2002) and let’s call this the standard explanation of the relationship between interest and learning: with increases in individual interest knowledge also increases.

Recently, however, two alternative hypotheses explaining the relationship between interest and learning have emerged, stressing the situational nature of interest, which is why it is referred to as situational interest (Hidi, 2006; Hidi & Baird, 1986). The first hypothesis is referred to as the trigger-maintenance hypothesis (Hidi, 1990, 2006; Hidi & Baird, 1986; Hidi & Renninger, 2006; Mitchell, 1993). Under this account, it is assumed that interest is not always a more or less stable attribute of the learner, only changing with the growth of knowledge, but can also be a situational phenomenon, aroused or “triggered” by precipitating events in the learning situation (Durik & Harackiewicz, 2007). Once triggered, situational interest needs to be maintained in order for learning to take place (Ainley, 2006). In this trigger-maintenance explanation there is no need for interest to increase with increasing knowledge gains; maintaining a sufficiently high level of situational interest is all that is needed for learning to take place.

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Among the first authors who proposed the trigger-maintenance hypothesis were Hidi and Baird (1986). (But see Dewey, 1913.) They noted that “As a process, interest has a durational aspect—there are triggering conditions and there are conditions which ensure the continuation of interest” (p. 191). One of these maintenance conditions they mention is providing learners with information that has high personal significance. Mitchell’s (1993) contribution also fits with the trigger-maintenance account as he developed a questionnaire consisting of subscales that tap into the triggering and maintaining of situational interest (which he referred to it as “catching” and “holding” interest following Dewey (1913) in secondary-school mathematics). He proposed that triggering interest could be achieved by presenting various cognitive and sensory stimuli (e.g., computers, puzzles), whereas maintaining it could best be achieved by involving students in meaningful activities that empower them in their learning. In a similar vein, Ainley and Patrick (2006) proposed that situational interest can be triggered by a learning task and if the information flow regarding the task is at a steady rate it matches or maintains the initial level of activation. According to these authors, situational interest can even increase if the incoming information relevant to the task contains twists and turns that make it more intriguing to students.

As a process, interest has a durational aspect. As Berlyne calls it, the emergence of situational interest (or epistemic curiosity as Berlyne calls it) is the result of a gap between what one knows about a particular topic and what seemingly needs to be known; situational interest in this point of view is triggered by the experience of a knowledge deficit. If a precipitating event in the learning situation produces such awareness and therefore situational interest, the learner seeks additional knowledge about the topic until the gap is closed. A counterintuitive prediction of the knowledge-deprivation hypothesis, first noticed by Rotgans and Schmidt (2011a), is that with the increase of knowledge situational interest must decrease. If the perceived gap is closed because of knowledge gains, there is no additional impetus for further knowledge to be acquired and, hence, situational interest must be reduced. Situational interest is “thirst for knowledge”, and like ordinary thirst, situational interest can be satisfied by being “quenched” with knowledge. In short, the knowledge-deprivation hypothesis suggests that perceived lack of knowledge leads to situational interest, which then leads to learning. However, the result of this learning is that increased knowledge diminishes situational interest.

Although the trigger-maintenance and the knowledge-deprivation hypotheses are similar in a number of ways—both assume that situational interest needs to be triggered and that novelty and surprise produced by the precipitating event is a necessary condition for situational interest to emerge—they are distinctive in other ways. An example may elucidate this. Assume that secondary-school students in Singapore will be presented the following History problem: “During the Second World War the Japanese conquered the island of Singapore despite the fact that the British and Allied Forces outnumbered them three to one. How was this possible?”

Under the trigger-maintenance framework this problem will trigger situational interest if it is perceived as sufficiently novel, surprising, unexpected, or personally relevant (Hidi & Renninger, 2006; Schraw & Lehman, 2001; Schraw et al., 2001). The knowledge-deprivation framework, however, further specifies this requirement of novelty or surprise. It states that situational interest only arises if the learner (a) does not have sufficient knowledge to understand the problem in full and (b) becomes aware of a knowledge deficit between what he or she understands about the problem and what is needed to fully understand it. If no gap is perceived, no situational interest will be triggered.¹

A second difference between the two points of view is that the trigger-maintenance hypothesis suggests that while studying a text containing new information about the conquest of Singapore (after having been confronted with the problem) situational interest will be maintained at an optimal level, as long as the text contains meaningful and personally relevant information. The knowledge-deprivation hypothesis however predicts that, while studying the text and gaining knowledge about it, situational interest will be “satisfied” and therefore will decrease.

### 1.1. Research into situational interest

Historically, research into situational interest has predominantly been concerned with identifying factors that trigger it (Schiefele, 1991; Schraw, 1997; Schraw et al., 1995). For instance, studies suggest that factors such as text coherence, vividness, relevance, novelty, unexpectedness, suspense, seductive details, puzzles, computers, hands-on and physical activities trigger students’ situational interest (Fraughton, Sansone, Butner, & Zachary, 2011; Holstermann, Grube, & Bögelholz, 2010; Palmer, 2004, 2009; Schraw et al., 2001). There are, however, far fewer studies that have investigated how it is maintained after having been triggered. An exception is Mitchell (1993)’s questionnaire study on interest in mathematics, mentioned earlier. This study suggests that meaningfulness of mathematics for students’ personal lives and active involvement of students in the learning process are preconditions for situational interest to be maintained. Other contributions to the trigger-maintenance framework are theoretical rather than empirical in nature and suggest that a supporting (learning) environment is a key element in maintaining situational interest (Hidi & Renninger, 2006; Renninger & Hidi, 2011).

Although there is general consensus among interest researchers that situational interest positively affects student learning and knowledge attainment (Ainley, 2006; Ainley et al., 2002; Hidi, 1990, 2006; Hidi & Harackiewicz, 2000; Renninger & Hidi, 2002), there is surprisingly little research showing that situational interest actually has a positive effect on knowledge acquisition. It seems that most authors take positive effects of situational interest on learning for granted. The focus in most studies is on what triggers interest, rather than on how situational interest induces learning.

A third problem is that in the typical study of the phenomenon, situational interest tends to be measured only once (e.g., Chen, Darst, & Pangrazi, 2001; Cordova & Lepper, 1996; Schraw, Flowerday, & Reisetter, 1998), whereas from our description of the possible relationship between situational interest and learning can be deduced that it involves discontinuous changes over time. Thus, as noted by Ainley et al. (2002), measurement of interest before or after a task does not necessarily provides insight in what happens during the task.

In an attempt to study situational interest in the natural classroom setting, Rotgans and Schmidt (2011a) applied what they refer to as a “micro-analytical measurement approach”. This approach entails that...
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