

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/333710395>

The Mediatlional Role of Engagement in the Relationship Between Curiosity and Student Development: A Preliminary Study

Article in *Journal of Happiness Studies* · April 2020

DOI: 10.1007/s10902-019-00140-8

CITATIONS

18

READS

623

3 authors:



Veselina Vracheva

Chapman University

17 PUBLICATIONS 771 CITATIONS

SEE PROFILE



Robert C. Moussetis

North Central College

9 PUBLICATIONS 81 CITATIONS

SEE PROFILE



Ali Abu-Rahma

Abu Dhabi University

14 PUBLICATIONS 117 CITATIONS

SEE PROFILE



The Mediational Role of Engagement in the Relationship Between Curiosity and Student Development: A Preliminary Study

Veselina P. Vracheva¹ · Robert Moussetis² · Ali Abu-Rahma³

© Springer Nature B.V. 2019

Abstract

This paper examines relationships among curiosity, engagement, and student development across five domains—(1) cognitive complexity, (2) knowledge acquisition, construction, integration, and application, (3) humanitarianism and civic engagement, (4) intrapersonal and interpersonal development, and (5) practical competence. Although extant research examines antecedents and outcomes of engagement extensively, no study explicitly assesses curiosity, engagement, and student development. Results suggest that engagement mediates epistemic and perceptual types of curiosity and student development. Educators and administrators can use these findings to create engaging education during which curiosity swiftly transforms into holistic student development.

Keywords Engagement · Curiosity · Student development · Mediation

1 Introduction

In modern education contexts that prepare young people to face contemporary challenges, there is growing interest among researchers to determine what constitutes student happiness (Michalos 2017). Multiple studies investigate relationships between education and happiness (Chen 2012; Chen and Davey 2008; Chyi and Mao 2012; Hu 2015; Soutter et al. 2011; Yang 2008) and the influence of education on happiness-like constructs, such as life satisfaction (Zullig et al. 2009), hope (Gallagher and Marquez 2017), and friendship (Demir et al. 2012). Considering the global impetus for value-based instruction (Pathak and Pathak 2010), educators and administrators are increasingly focusing on student

Ali Abu-Rahma: Deceased 8 November 2018.

✉ Veselina P. Vracheva
vracheva@chapman.edu

¹ Argynos School of Business and Economics, Chapman University, 1 University Dr., Orange, CA 92866, USA

² School of Business and Entrepreneurship, North Central College, 30 N Brainard St., Naperville, IL 60540, USA

³ College of Business, Abu Dhabi University, Al Ain Rd., Abu Dhabi, UAE

development as it relates not only to improvements to competencies that enhance employability, but students' physical, spiritual, ethical, and intellectual growth that lasts throughout their lives (James et al. 2011; Ransome 2011). Thus, a value-based curriculum is a holistic approach to enhancing student wellbeing that promotes values such as love, peace, cooperation, freedom, tolerance, honesty, and happiness (Iyer 2013).

Wellbeing that derives from living life in a full and deeply satisfying way is known as eudaimonia (Deci and Ryan 2008), distinguished from wellbeing as "a subjective condition of getting what one wants and the pleasure that comes with it," also known as hedonia (Schueller 2013, p. 2661). Eudaimonia is not a mental state or feeling of satisfaction; it is a way of living (Ryan et al. 2008), contingent on progress in at least six domains—self-acceptance, positive relationships with others, personal growth, purpose in life, environmental mastery, and autonomy (Ryff and Singer 2008)—and defined in terms of whether an individual is doing what is worth doing and having what is worth having, thereby calibrating an individual's optimal psychological functioning (Waterman et al. 2008). Eudaimonic wellbeing has been studied in many contexts, including aging (Mackenzie et al. 2018), corporate leadership (Grant et al. 2018), meaningful customer experiences (Knobloch et al. 2017), and economics (Richards 2013). Of interest to researchers have also been numerous correlates of the construct, such as parental modeling (Huta 2012), moral identity (Sage and Kavussanu 2010), and intrinsic motivation (Waterman et al. 2008). Since life achievement and progression associate with life satisfaction, happiness, and overall eudaimonic wellbeing (Abele et al. 2016; Kryza-Lacombe et al. 2018), we argue that exploration of eudaimonic antecedents of student development, particularly as a reflection of successful academic and life progression, is warranted.

Although this topic is not studied extensively from a student perspective, some research supports integration of eudaimonia and student development. From a positive psychology standpoint, in academic contexts learning and wellbeing correlate, and as contributors to learning, development, and personal effectiveness, wellbeing and happiness are useful tools to student-affairs educators (Mather 2010). Clement (2010) conceptualizes links between eudaimonia and student affective, cognitive, and social development, underscoring the synergy between cognition and affect. Cognitive skills that are promoted during education cannot function in isolation from the state of student emotions and body, and yet empirical investigations that test such associations are limited.

One way to enhance student development is by cultivating curiosity and engagement (Lejeune et al. 2016) because curious and engaged students are good learners who adapt more quickly to education and work demands (Guthrie and Anderson 1999; Skinner and Belmont 1993). Research suggests that student engagement associates positively with student development (Hulme et al. 2013), especially in terms of effort toward achieving concrete, performance-based outcomes, such as grade point average (Kuh et al. 2008). Curiosity influences student development by generating comfort with ambiguity and complexity, prompting knowledge investment to unravel highly complex challenges (Chamorro-Premuzic 2014). Curiosity is also reflected in faster learning (Gruber et al. 2014), recognition of personal growth opportunities (Kashdan et al. 2004), and overall happiness (Kashdan and Steger 2007).

Defining curiosity is challenging because of variations in its meaning and operationalization (Kashdan et al. 2009). Those who conceptualize it as an innate human desire to gain knowledge and experiences that trigger probing behaviors (Kashdan 2009; Litman and Spielberger 2003; Litman 2010) argue that people are intrinsically curious, focusing on figuring something out or wondering about idiosyncrasies in the world (Opdal 2001). Others conceptualize it as "a reaction to novel stimuli that involves feelings of interest and

uncertainty” (Collins et al. 2004, p. 1128). We integrate these two conceptualizations, defining curiosity from two perspectives: (1) as an innate interest in developing and testing new knowledge, also known as epistemic curiosity, and (2) as a state of mind triggered by sensory stimulation that leads to new knowledge, also known as perceptual curiosity. Research suggests that curiosity has a eudemonic expression. Kashdan et al. (2008) argue that highly curious individuals are more responsive to growth-oriented events versus hedonistic experiences. Curiosity has also been studied “as a mechanism for achieving and maintaining high levels of well-being and meaning in life” (Kashdan and Steger 2007, p. 159).

Engagement constitutes degree of involvement, commitment, passion, absorption, focused effort, zeal, dedication, and energy (Schaufeli 2014). Interesting work generates greater engagement and enjoyable persistence, coupled with better performance (Schlehty 1994). Many studies support a positive association between engagement and student development (Kuh 2009; Pascarella and Terenzini 2005). Due to their capacity to entice individuals to challenge themselves and search for personal growth, both curiosity and engagement correlate with eudaimonia (Disabato et al. 2016), suggesting that engagement and curiosity both influence student development and therefore have eudaimonic effects that impact both the content of a student’s life and processes involved in living well in an academic context, in comparison to hedonic pursuits such as outcomes associated with achieving positive affect and avoiding pain (Ryan et al. 2008). However, the mechanisms by which these relationships occur are understudied.

Extant research provides sufficient evidence to assess whether engagement mediates the correlation between curiosity and student development. This study assesses student development as a eudaimonic phenomenon, and thus development is defined holistically in terms of five domains as the Council for the Advancement of Standards in Higher Education (2015) suggests and that are conducive to eudaimonic wellbeing: (1) cognitive complexity, (2) knowledge acquisition, construction, integration, and application, (3) humanitarianism and civic engagement, (4) intrapersonal and interpersonal development, and (5) practical competence.

1.1 Curiosity, Engagement and Student Development

Using an academic context, Reschly and Christenson (2012) propose a conceptual model that outlines antecedents and outcomes of engagement, arguing that engagement mediates the relationship between context and student development. They also argue that engagement is an action term and that degree of student engagement depends partially on context, defined as interactions at home, school, with peers, and in the community, and partially on the individual. Although their model focuses on mediation of engagement between context and student development, it inherently suggests that a student perspective is paramount to changes to student learning and behavior, and that “it is critical to understanding the person-environment fit and to efforts to enhance student engagement” (p. 13). We use this argument to construct a conceptual model that links curiosity, engagement, and student development. In the model, curiosity and engagement are a product of context, such as an individual’s sociocultural environment, family, friends, and school (Reschly and Christenson 2012). Regarding individual attributes, the model acknowledges the role of demographics, psychographics, and individual needs (Fig. 1).

The model offers only a sample of contextual and individual factors that associate with this study’s primary variables, and it is not intended to offer an exhaustive list of correlates.

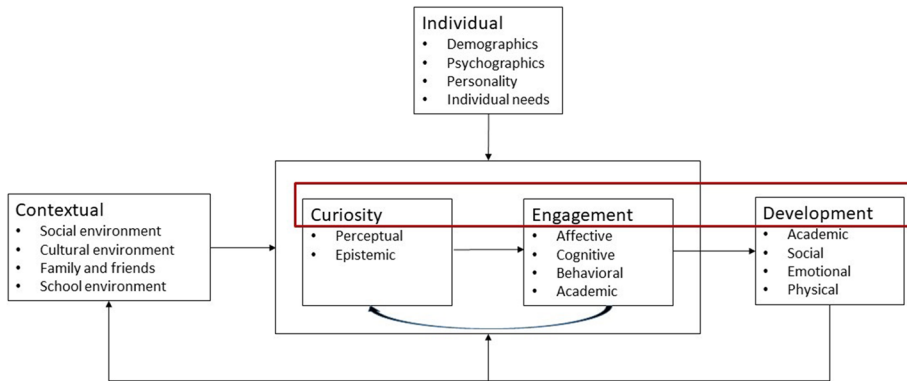


Fig. 1 Conceptual model with the present study's model outlined in red

Its purpose is to contextualize the investigation. An important aspect of the model is feedback loops from student development to curiosity and engagement, from student development to contextual factors and individual attributes, and from engagement to curiosity. The last pair is paramount to understanding the intent of this study. Arnone et al. (2011) address the association between curiosity and engagement and between engagement and curiosity, proposing a model to explain conditions under which curiosity leads to engagement. Citing Reeve (2006), they suggest that when engagement associates with positive emotions and opportunities to express one's voice (among other factors), engagement triggers curiosity. Although our model acknowledges such relationships, assessing effects of feedback loops lies outside of the investigation's scope. Instead, a literature review synthesizes studies that find relationships between engagement and student development, curiosity and student development, and curiosity and engagement. We empirically test associations among student curiosity, engagement, and success in selected domains as part of a conceptual model. Findings suggest that educators and administrators should promote value-based education, create engaging learning, and transform student curiosity into desired outcomes along the five outcome dimensions, which support life success and wellbeing beyond academic experiences. This study thus identifies a mechanism by which curiosity translates into sound student development.

2 Literature Review

2.1 Engagement and Student Development

In academia, engagement broadly describes relationships among the institution, students, the campus, and society (Solomonides et al. 2012). Engagement is a multidimensional construct that reflects a combination of behavioral, emotional, and cognitive aspects. Behavioral characteristics of student engagement encompass showing up to class, positive conduct, learning involvement, exerting effort, following instructions, and participating (Fredricks et al. 2004). Emotional engagement involves a sense of belonging at school (Goodenow and Grady 1993), identification with the school (Finn 1993), school connectedness (Shochet et al. 2006), and attachment to school (Johnson et al. 2001). Cognitive engagement

relates to a student's degree of thoughtfulness about education and being devoted to learning (Craik and Lockhart 1972; Marks 2000).

Research suggests relationships among dimensions of engagement to aspects of student development. For example, behavioral engagement associates with academic performance (Carbonaro 2005). Behavioral and emotional engagement correlate positively with student learning outcomes (Borman and Overman 2004), and cognitive engagement and life satisfaction correlate bidirectionally and positively in the United States (Lewis et al. 2011). Several studies assess whether student wellbeing, as a eudaimonic phenomenon, is a manifestation of multidimensional engagement. As an affective manifestation, eudaimonia is viewed as "feelings of happiness that results from engaging in activities that are intensely interesting and personally meaningful to the individual" (Medhurst and Albrecht 2016, p. 31), and as a cognitive expression, it is "complete absorption in and deep connection to moment-to-moment experiences and activities" (Medhurst and Albrecht 2016, p. 31). Closer to the context of the current study, Clement (2010) argues, "Any consideration of student wellbeing at school cannot be constricted to a narrow set of indicators, but must be multi-faceted and holistic and include personal, cognitive, affective, social, physical, psychological, moral and spiritual dimensions" (p. 37).

Student engagement associates with an increase in positive development in personal and interpersonal skills, such as enhanced societal awareness and civic engagement (Berry and Workman 2007), and subsequently, students' emotional intelligence (Marques 2016). It also boosts relationship skills (Besana and Esposito 2017), emotional regulation (Reschly and Christenson 2012), intercultural communication, conflict resolution (Paulus et al. 2006), and academic satisfaction (Urquijo and Extremera 2017). Active student engagement relates to better academic performance (Fredricks et al. 2004; Lee and Shute 2010; Schaufeli et al. 2002) and vigor, and dedication produces academic success (Salanova et al. 2010). Engagement also increases student adaptability to environmental changes (Fredricks et al. 2004). Numerous studies evidence engagement as a predictor of student development (Salanova et al. 2010; Schaufeli et al. 2002; Vasalampi et al. 2009). In contrast, disengaged students struggle academically and behaviorally, and commonly drop out (Fredricks et al. 2004), suggesting that academic failure and dropping out are not isolated events but the result of a long-term process of disengagement from school (Randolph et al. 2004).

2.2 Curiosity and Student Development

Various studies focus on the context of student development, including college environments, institutional factors (Calcagno et al. 2008), social strata (Hatt et al. 2005), educational practices such as peer cooperation, faculty–student interactions, active learning (Koljatic and Kuh 2001), and other classroom experiences (Allison et al. 2001; Herzog 2007). Economic, social, psychological, and organizational factors are also antecedents of academic success and development. As characteristics of the environment, motivation also influences student development positively (Pajares 1996). When assessing student growth, personal attributes explain variances in academic achievement beyond intelligence and context (Bratko et al. 2006; Gilles and Bailleux 2001; Nofle and Robins 2007; Poropat 2009). The Big Five personality traits are stronger predictors of student development than are intelligence and the context in which learning occurs (Higgins et al. 2007). As a central factor of human happiness and derivative of an individual's core motivational inclinations (Ryan and Deci 2000), curiosity has been studied as a correlate of student development (Lohman 2009).

Curiosity research assesses various conceptualizations of the construct, including interpersonal (Litman and Pezzo 2007), moral (Sekerka et al. 2013), epistemic (Litman 2010), and perceptual (Berlyne 1965). Curiosity has also been studied in various fields, such as psychology (Litman and Jimerson 2004), neurobiology (Kang et al. 2009), and education (Engel 2011; Eren 2009). Studies of curiosity among students suggest that curious students learn better than those who lack an intrinsic drive for new knowledge and have strong interests in understanding and explaining the world (Kashdan et al. 2009). Student curiosity is a prerequisite to development of intelligence, wisdom, and coping with stress (Renninger et al. 1992), motivation and improved learning (Kashdan et al. 2004), engagement and performance in learning contexts (Harackiewicz et al. 2002; Kashdan and Yuen 2007), and emotional intelligence (Leonard and Harvey 2007). Lack of curiosity represents a risk factor for anxiety disorders, with adverse influences on academic achievement (Silvia 2006).

In comparison to other conceptualizations of curiosity, the epistemic variety has attracted more attention in education contexts because it is highly relevant to student learning, achievement, and cognitive development as central goals of traditional, evidence-based approach to education (Engel 2011). Eren (2009) found a positive association between epistemic curiosity and student achievement orientation. Epistemic curiosity also correlates with a student's deeper understanding of knowledge (Richards et al. 2013), and in turn with graded performance (Eren and Coskun 2016). It also influences creative problem-solving and performance (Hardy et al. 2017), positive outcome expectancies, and thoughtful evaluation and fun-seeking (Lauriola et al. 2015). Although broader literature on student curiosity focuses on epistemic curiosity (Harrison et al. 2011; Litman and Silvia 2006), a few studies have also explored student development outcomes of perceptual curiosity (Collins et al. 2004).

Perceptual curiosity stimulates exploratory behaviors (Berlyne 1960) that link to sentiments that influence student learning, motivation achievement, and holistic curiosity (D'Mello and Graesser 2012; Mega et al. 2014). However, it has received limited attention in education research, and a valid psychometric instrument that assesses perceptual curiosity was unavailable until the late 1990s (Collins 1996). Subsequent research focused primarily on understanding the construct itself (Collins et al. 2004; Litman and Spielberger 2003), and thus more research is needed to assess its influence on student development. Epistemic curiosity is widely researched regarding student engagement and development (Engel 2011; Eren 2011). Curiosity in academic contexts affects both performance and engagement positively (Harackiewicz et al. 2002), and thus we discuss the sparse research that links curiosity with engagement.

2.3 Curiosity and Engagement

Assessing contextual antecedents during student engagement, research evidences the role of family, schools, peers, and communities (Reschly and Christenson 2012), other contextual factors (Arnone and Small 2013), and behavioral, emotional, psychological, cognitive, and academic factors (Appleton et al. 2008; Fredricks et al. 2004). Few studies, however, assess the relationship between curiosity and engagement (Garrosa et al. 2017) but collectively suggest that highly engaged students exhibit greater curiosity (Hulme et al. 2013; Louis and Hulme 2012), though curiosity does not automatically lead to engagement (Arnone and Small 2013) due to influences of various internal and external factors.

With some exceptions, research that suggests an association between curiosity and engagement do not distinguish epistemic from perceptual curiosity. Various arguments

have been made regarding mechanisms by which curiosity affects engagement positively. Some researchers suggest that curiosity represents a type of intrinsic motivation, projecting aspects of an individual's personal orientation (Arnone and Small 2013), and a tendency to explore one's surroundings through activities that facilitate learning and growth (Silva 2012). Thus, curiosity motivates individuals to be more highly engaged in challenging activities that require high levels of energy and effort, and that subsequently increase wellbeing (Ouweneel et al. 2012). In a study of Spanish undergraduate students, Garrosa et al. (2017) demonstrate the potential of curiosity to enhance engagement. To establish the validity of the career adaptation ability scale, comprising concern, control, confidence, and curiosity subscales, in an international context, Merino-Tejedor et al. (2016) found a strong direct effect of curiosity on engagement.

Some researchers characterize curiosity as a driver of student engagement (Hulme et al. 2013). Curiosity is a character strength that influences a student's drive and the degree of academic engagement (Garrosa et al. 2017). To satisfy their curiosity, students must engage. Highly curious individuals have more meaningful learning experiences and better information retention since they engage more intensely in their own learning (Silvia 2006). Since curious individuals experience a desire to search for and discover opportunities to acquire new information and experiences (Hulme et al. 2013) and learn the unknown, they engage in enhanced curiosity-related behaviors, emotions, and cognitions, such as engagement directed at favored outcomes. Many studies demonstrate an association between epistemic curiosity and student engagement (Eren and Coskun 2016; Litman 2010; Rotgans and Schmidt 2014), but none assesses perceptual curiosity and student engagement.

3 Methods

3.1 Research Model

The Fig. 1 shows the research model tested in this paper, which suggests that engagement mediates the association between perceptual and epistemic curiosity and student development.

3.2 Participants and Procedures

Prior to data collection, the questionnaire and procedures used in this study received approval from the Institutional Review Board of the study's home institution. We used purposive sampling to collect data from students at a private liberal-arts college located in the Midwestern United States. A survey was distributed online, and students from various majors were solicited. One hundred eighty-three students enrolled in twelve majors submitted usable responses. The majors represented a range of fields, including elementary education, sociology, political science, actuarial science, global studies, religious studies, graphic design, exercise science, psychology, English studies, and business majors such as accounting, economics, management, marketing, and international business. Fifty-five percent of participants were female and 45% were male. The mean age was 21.59 years ($SD=2.37$). Participants completed an online survey that collected variables required

to test the model. Professors were asked to present the study to participants and provide 15 min of class time for students to complete the survey online.

3.3 Measures

The measure for student development was adapted from the Student Learning and Development Outcomes of the Council for the Advancement of Standards in Higher Education (2015) CAS professional standards for higher education, which designates five broad domains of student development: (1) cognitive complexity, (2) knowledge acquisition, construction, integration, and application, (3) humanitarianism and civic engagement, (4) intrapersonal and interpersonal development, and (5) practical competence. Using the council's descriptions of dimensions that comprise student learning, we developed a 20-item scale to measure student development. Using a 5-point, Likert-type scale (1 = strongly disagree, 5 = strongly agree), students reported their agreement with each item. Sample items included "My education helps me enhance my critical thinking abilities," "My education helps me increase my sensitivity to the needs of others," and "My education helps me improve my decision-making." The full scale appears in the "Appendix". Engagement was measured using the student version of a 17-item Engagement Scale from Schaufeli et al. (2002). Using a 5-point, Likert-type scale, students reported their agreement with items such as "When I get up in the morning, I feel like going to class", "To me, my studies are challenging," and "When I am studying, I forget everything else around me." Perceptual curiosity was measured using the Perceptual Curiosity Scale of 12 items from Collins et al. (2004). The students used a 5-point, Likert-type scale (1 = very untrue, 5 = very true) to rate the truthfulness of statements such as "I travel to places I have never been to," "When I smell something new I want to find out what it is," and "I like trying different foods." Epistemic curiosity was measured using the 10 Epistemic Curiosity Scale items from Litman and Spielberger (2003). The students used a 5-point, Likert-type scale (1 = definitely false, 5 = definitely true) to rate whether statements described them. The statements included "I enjoy learning about subjects which are unfamiliar," "I like new kinds of arithmetic problems and enjoy imagining solutions," and "I like riddles and am interested in trying to solve them." We controlled for sex (female = 0, male = 1), major (0 = non-business major, 1 = business major), and work experience (0–10 h/week = -1, 11–15 h/week = 0, 16–20 h/week = 1, > 20 h/week = 2).

4 Results

Means, standard deviations, construct correlations, and reliabilities are shown in Table 1. The reliabilities of the constructs were 0.95 (student development), 0.89 (engagement), 0.86 (perceptual curiosity), and 0.88 (epistemic curiosity), which exceed recommended values for research in the social sciences (Riffe et al. 2005). Data were analyzed using multiple regression (maximum-likelihood discrepancy) to obtain standardized betas, F statistics, *p*-values, and error terms for the endogenous variables. Results of these analyses appear in Table 2. β values discussed below are standardized.

Table 1 Correlation matrix and descriptive statistics

	Mean	SD	1	2	3	4	5	6
1. Student success	3.92	.71	(.95)					
2. Engagement	3.08	.63	.59**	(.89)				
3. Perceptual curiosity	3.70	.73	.19**	.21**	(.86)			
4. Epistemic curiosity	3.78	.69	.31**	.39**	.47**	(.88)		
5. Work experience	.21	1.23	.02	-.07	-.02	-.07	–	
6. Major	.69	.46	-.11	-.18*	-.11	-.06	.03	–
7. Sex	.46	.50	.12	.03	.274**	-.01	.06	-.20**

Cronbach's alpha coefficients shown in parentheses

** $p < .01$, * $p < .05$, $N = 183$

4.1 Direct Effects

Regression analysis was conducted to test the direct effects of the two curiosity measures on engagement and student development. As Table 2 (Models 1 and 2) shows, perceptual curiosity ($\beta = 0.20$, $p < .01$) and epistemic curiosity ($\beta = 0.41$, $p < .01$) correlated positively with engagement. Results for Models 1a and 3 suggest that perceptual curiosity ($\beta = 0.23$, $p < .05$) and epistemic curiosity ($\beta = 0.35$, $p < .01$) influenced student development.

4.2 Engagement Mediation

A 3-step regression was conducted to examine mediation by engagement (Baron and Kenny 1986). Regression results in Table 2 show that perceptual curiosity (Model 1a) and epistemic curiosity (Model 3) correlated positively with student development. They also associated with engagement (Models 1 and 2). When engagement was entered into Models 2a (perceptual curiosity) and 4 (epistemic curiosity), associations of the two types of curiosity on student development were marginally significant ($p < .1$), suggesting mediation by engagement.

5 Discussion

This study uses an integrative approach to assess relationships among three constructs that have not been examined simultaneously—curiosity, engagement, and student development. We conceptualize these constructs as tools that teachers and administrators can use to entice students to seek eudemonic outcomes throughout their education. We thus suggest that development of work-related competencies is a necessary but an insufficient condition for students to achieve academic life satisfaction. Creating conditions for students to build character is equally important to ensuring student wellbeing. As an innate interest in new knowledge and a state of mind triggered by sensory stimuli that lead to knowledge acquisition (Collins et al. 2004; Litman 2010), curiosity influences the content of student life and can be used as a framework to help students judge what knowledge is valuable and what should be discarded. As an action item (Reschly and Christenson 2012), engagement is reflected in the processes by which student wellbeing and both academic and life

Table 2 Results of regression analysis

Independent variables	Engagement		Student development											
	Model 1	SE	Model 2	SE	Model 1a	SE	Model 2a	SE	Model 3	SE	Model 4	SE	Model 5	SE
Control variables														
Sex	.04	.10	.10	.09	.10	.11	.08	.09	.17**	.10	.11*	.08	.09	.09
Major	-.16**	.10	-.15**	.09	-.06	.11	.04	.09	-.05	.11	.04	.09	.03	.09
Work experience	-.13*	.04	-.11*	.04	.05	.04	.13**	.03	.06	.04	.13**	.03	.13**	.03
Main effects														
Perceptual curiosity	.20***	.07			.23**	.07	.11*	.06					.08	.07
Epistemic curiosity			.41***	.06					.35***	.07	.11*	.07	.08	.06
Mediation														
Engagement							.61***	.07			.59***	.07	.59***	.07
R ²	.10		.23		.09		.43		.16		.43		.43	
Adjusted R ²	.08		.21		.07		.41		.14		.41		.41	
F-value	4.94***		13.12***		4.28		26.28***		8.528***		26.25***		22.131***	
Max VIF	1.124		1.049		1.124		1.126		1.05		1.3		1.52	

Coefficients are standardized (N = 183)

* $p < .1$; ** $p < .05$; *** $p < .01$

satisfaction are attained. This study suggests that student development should reflect a form of student wellbeing that moves beyond grade point averages and other concrete, performance-based outcomes, and that curiosity and engagement associate with holistic dimensions of student development.

The study also suggests that in the context of student development, eudaimonia has a multifaceted manifestation of cognitive and affective factors, an important consideration during selection of measures of antecedents of student development—curiosity and engagement. We assess the effects of the vigor of engagement (i.e., affective) and absorption in and dedication to engagement (i.e., cognitive). We similarly explore epistemic (i.e., cognitive) and perceptual (i.e., affective) aspects of curiosity on student development, an approach that underscores that student development, understood in the context of eudaimonic wellbeing, cannot be fully assessed without accounting for multilevel factors, including personal, cognitive, affective, social, physical, psychological, moral, and spiritual factors, which synergistically reinforce each other during attainment of wellbeing. This approach accords with Clement (2010), who argues, “To be effective, education must engage students across affective, cognitive and social domains” (p. 36). Using three directions found in the literature, this investigation explores the link between curiosity and student development. Findings suggest that engagement mediates the links between both students’ epistemic and perceptual curiosity and student development, measured using five holistic student development domains—(1) cognitive complexity, (2) knowledge acquisition, construction, integration and application, (3) humanitarianism and civic engagement, (4) intrapersonal and interpersonal development, and (5) practical competence (Council for the Advancement of Standards in Higher Education 2015).

This study demonstrates that curiosity correlates positively with engagement, consistent with a few studies that identify similar links. Garrosa et al. (2017) suggest that curiosity enhances engagement regarding scholastic achievement. Eren (2011), Richards et al. (2013) and Rotgans and Schmidt (2014) also evidence an association between epistemic curiosity and engagement. Exploration of an association between perceptual curiosity and engagement is novel, with limited research on perceptual curiosity suggesting that it associates with openness to experience and need for cognition (Kelly and Daughtry 2016), both of which correlate with student development (Bowman 2014; Kilgo et al. 2015). Thus, assessment of its influence on student development is meaningful. A significant association also implies that overemphasizing epistemic curiosity development is tantamount to neglecting opportunities to increase student development using other motivators of curiosity. Studies that report a correlation between engagement and student development suggest that more engaged students enjoy better academic performance (Lee and Shute 2010) and overall academic success (Salanova et al. 2010). This association is the most well-researched component of the current study, and current findings accord with the literature.

The literature examines the relationship between curiosity and student development, finding that curiosity associates positively with student learning, achievement, cognitive development (Engel 2011; Eren 2011) and performance (Lejeune et al. 2016). Current findings corroborate such research. Although epistemic curiosity attracts more attention in educational contexts because it is highly relevant to student learning, achievement, and cognitive development (Engel 2011; Eren 2011), we find that engagement transforms into better student development not only regarding knowledge-seeking (i.e., epistemic curiosity), but also experience-seeking (i.e., perceptual curiosity), suggesting that exploratory behaviors that link with sentiments should not be ignored while engaging students to develop and

achieve success. Current findings suggest that curiosity is a necessary but insufficient factor regarding student development, a finding that corroborates Reschly and Christenson's (2012) model, which inherently recognizes the student perspective as paramount to changing the degree of student engagement and achievement of desired outcomes.

5.1 Implications

Findings from this study are consistent with research that assesses reinventing undergraduate education (Boyer 1998), the Greater Expectations Report (AACU 2002), and recommendations from the Secretary of Education's Commission on the future of higher education (U.S. Department of Education 2006), which encourages engagement of college students. Engagement in academic and social activities is critical to student development, since engaged students receive higher grades and have greater college experience satisfaction (Lewis et al. 2011). College is transformative, during which students engage in success-seeking behaviors through academic work and extracurricular activities. Employers are increasingly interested in the practical abilities and personality attributes of prospective employees, and consequently, the focus of college experiences should shift toward identifying how to leverage student curiosity to generate optimal education outcomes, including extra-curricular activities that prepare students for employment and other aspects of life. For example, interviews with former college students suggest that students remember concrete experiences such as their study abroad, a senior musical, a major sporting accomplishment, working with the community, and science or debate competitions. These events do not always take place in the classroom, so to facilitate greater student development, it is important to identify how to trigger memorable and meaningful student experiences in the classroom. One component of such events is the presence of external parties that entice students to engage publicly and purposefully. Student engagement can thus be increased by altering educational outcomes to allow students to deliver work to larger audiences beyond classmates.

In terms of education policy, findings from this study suggest several possibilities. First, findings suggest that students benefit from development of open-ended general education programs that build on curiosity. Second, creating external stimuli that train students to unravel complex, ambiguous situations provides students with non-traditional perspectives to acquire, integrate, and construct knowledge, develop interpersonal skills, and become engaged citizens. Third, professors receive minimal training on how to be teachers, and thus training how to trigger curiosity and enable engagement creates a novel critical mass of independent and creative thinkers that require less classroom instruction and more facilitation.

The general education programs that many colleges implement are rooted in traditional liberal arts colleges of the nineteenth and twentieth centuries. However, with the abundance of technology used to access information on any topic, one suggestion is to abandon traditional general education programs to create an environment that cultivates curiosity. For example, students could be allowed to take any courses they want, with the only requirement being communication (i.e., written and oral) classes. Beyond that, students should be free to explore any topic. Students who take a class by choice might have an added degree of curiosity, feel more connected to the institution, and increase engagement. First-year students should have an opportunity to explore an unstructured course in which they work with a teacher to design and implement a project in which they are interested. Students

can thus develop expert knowledge and skills by exploring a subject in-depth throughout a 4-year education (e.g., research projects, thesis, civic engagement, and practical training).

Colleges and universities should investigate how to integrate a study-abroad program into the college experience. Although most colleges offer study-abroad opportunities, purposeful use of this tool to foster curiosity is minimal. Studying abroad invites conceptual conflicts, poses unexplored questions and perspectives, provides time to explore those questions and perspectives, and introduces novelty, incongruity, surprises, complexity, and uncertainty, all of which are elements of curiosity. Such experiences also improve personal and interpersonal skills since they challenge an individual's ability to control unexpected emotions and remain calm and balanced during stressful situations. It compels them to reflect on their self-confidence, strengths, and limitations, and take initiative, measured risks, and responsibility. It improves their resilience and ability to bounce back from setbacks. Studying abroad also improves student citizenship and practical approaches to professional studies. Ample evidence suggests that studying abroad links with heightened curiosity and engagement. Colleges should train professors to help students transform curiosity into deliberate actions and assist them with expanding into new intellectual territories. College faculty should also be trained on how to manage learning activities with maximum effectiveness and be exposed to strategies to develop and trigger curiosity and engagement.

5.2 Limitations and Future Research

Participants were solicited from a single liberal arts college in the United States, and contextual variables, such as family background, quality of interactions with teachers and peers, and other student experiences, were not assessed. From these limitations, future research is suggested. Considering the achievement of desired student outcomes, the link between perceptual and epistemic curiosity and student development in terms of student learning outcomes has not been explored. Future research should take broader approaches to the combined effect of curiosity and engagement on representative samples of higher education institutions in the United States. Potential feedback loops between engagement and curiosity should also be assessed. The influence of curiosity and engagement on student development in various cultural contexts should be explored. Since cultural values affect outcomes, such as humanitarianism and civic engagement and intrapersonal and interpersonal development and competencies, findings might differ in cross-cultural contexts. Beyond the influence of cognitive and affective factors, personal, physical, psychological, moral, and spiritual variables should be examined to discover determinants of student development and wellbeing. Perceived and real attributes of instructors might also affect student development, and investigations into the link between student and instructor attributes and associations among curiosity, engagement, and student development are warranted. The present study suggests that students who work longer hours in employment outside of their education experience have lower levels of engagement than students employed in activities unrelated to their education. Explanations for these findings should be sought. This study demonstrates that business majors have lower engagement than non-business students do. Future research should examine pedagogical, personal, and contextual explanations for this phenomenon.

Appendix: Student Development Scale

Student Success Scale was adapted from the Council for the Advancement of Standards in Higher Education (2015) *CAS professional standards for higher education* (9th ed.), which designates the following broad domains for student learning outcomes: (1) cognitive complexity (CC), (2) knowledge acquisition, construction, integration and application (KAA), (3) humanitarianism and civic engagement (H) (4) intrapersonal and interpersonal development (IIC), and (5) practical competence (PC). Participants are asked the following:

Please indicate your level of agreement with the next 20 statements. Provide your answer on a scale of 1–5, with 1 being “strongly disagree and 5 “strongly agree”.

My education...

1. Helps me enhance my critical thinking abilities (CC1)
2. Helps me improve my quantitative reasoning (CC2)
3. Increases my openness to new ideas and different points of view (CC3)
4. Helps me understand knowledge from a range of disciplines (KAA1)
5. Enhances my ability to relate knowledge to daily life (KAA2)
6. Helps me understand human differences (H1)
7. Helps me appreciate human differences (H2)
8. Increases my sensitivity to the needs of others (H3)
9. Helps me improve my self-esteem (IIC1)
10. Helps me improve my self-esteem (IIC2)
11. Helps me increase my confidence (IIC3)
12. Helps me increase my integrity (IIC4)
13. Helps me develop an appreciation for the natural world (IIC5)
14. Helps me increase my sense of civic responsibility (IIC6)
15. Helps me improve my ability to work with people different from myself (IIC7)
16. Helps me improve my time-management skills (PC1)
17. Helps me improve my decision-making (PC2)
18. Will help me to be economically self-sufficient (PC3)
19. Improves my competencies in the area of my professional interest (PC4)
20. Improves my competencies in the area of my major (PC5)

References

- AACU. (2002). Greater expectations: A new vision for learning as a nation goes to college. In: *National panel report*.
- Abele, A. E., Hagmaier, T., & Spurk, D. (2016). Does career success make you happy? The mediating role of multiple subjective success evaluations. *Journal of Happiness Studies*, 17(4), 1615–1633.
- Allison, B. J., Voss, R. S., & Dryer, S. (2001). Student classroom and career success: The role of organizational citizenship behavior. *Journal of Education for Business*, 76(5), 282–288.
- Appleton, J. J., Christenson, S. L., & Furlong, M. J. (2008). Student engagement with school: Critical conceptual and methodological issues of the construct. *Psychology in the Schools*, 45(5), 369–386.
- Arnone, M. P., & Small, R. V. (2013). Acting on curiosity: What's changed, what hasn't, and what educators can do. In J. B. Jones & L. J. Flint (Eds.), *The creative imperative: School librarians and teachers cultivating curiosity together* (pp. 133–221). Santa Barbara, CA: Libraries Unlimited.
- Arnone, M. P., Small, R. V., Chauncey, S. A., & McKenna, H. P. (2011). Curiosity, interest and engagement in technology-pervasive learning environments: A new research agenda. *Educational Technology Research and Development*, 59(2), 181–198.

- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182.
- Berlyne, D. (1960). *Conflict, arousal, and curiosity*. New York, NY: McGraw-Hill.
- Berlyne, D. (1965). Curiosity and education. In J. D. Krumboltz (Ed.), *Learning and the educational process* (pp. 67–89). Chicago, IL: Rand McNally.
- Berry, G. R., & Workman, L. (2007). Broadening student societal awareness through service-learning and civic engagement. *Marketing Education Review*, 17(3), 21–32.
- Besana, A., & Esposito, A. (2017). Tourism curricula, entrepreneurial engagement and stakeholders' satisfaction: Economics and relationship marketing of universities. *Eurasian Business Review*, 7(3), 375–388.
- Borman, G. D., & Overman, L. (2004). Academic resilience in mathematics among poor and minority students. *The Elementary School Journal*, 104(3), 177–195.
- Bowman, N. (2014). Conceptualizing openness to diversity and challenge: Its relation to college experiences, achievement, and retention. *Innovative Higher Education*, 39(4), 277–291.
- Boyer, E. L. (1998). *The Boyer commission on educating undergraduates in the research university, reinventing undergraduate education: A blueprint for America's research universities*. New York, NY: Stony Brook.
- Bratko, D., Chamorro-Premuzic, T., & Saks, Z. (2006). Personality and school performance: Incremental validity of self- and peer-ratings over intelligence. *Personality and Individual Differences*, 41(1), 131–142.
- Calcagno, J., Bailey, T., Jenkins, D., Kienzl, G., & Leinbach, D. (2008). Community college student success: What institutional characteristics make a difference? *Economics of Education Review*, 27(6), 632–645.
- Carbonaro, W. (2005). Tracking students' efforts, and academic achievement. *Sociology of Education*, 78(1), 27–49.
- Chamorro-Premuzic, T. (2014). Curiosity is as important as intelligence. *Harvard Business Review*, 24(4), 166–171.
- Chen, W. (2012). How education enhances happiness: Comparison of mediating factors in four East Asian countries. *Social Indicators Research*, 106(1), 117–131.
- Chen, Z., & Davey, G. (2008). Happiness and subjective wellbeing in mainland China. *Journal of Happiness Studies*, 9(4), 589–600.
- Chyi, H., & Mao, S. (2012). The determinants of happiness of China's elderly population. *Journal of Happiness Studies*, 13(1), 167–185.
- Clement, N. (2010). Student wellbeing at school: The actualization of values in education. In T. Lovat, R. Toomey, & N. Clement (Eds.), *International research handbook on values education and student wellbeing* (pp. 37–62). Dordrecht: Springer.
- Collins, R. P. (1996). *Identification of perceptual curiosity as a psychological construct: Development of the perceptual curiosity scale (Master's thesis)*. Tampa: University of South Florida.
- Collins, R. P., Litman, J. A., & Spielberger, C. D. (2004). The measurement of perceptual curiosity. *Personality and Individual Differences*, 36(5), 1127–1141.
- Council for the Advancement of Standards in Higher Education. (2015). CAS learning and development outcomes. In J. B. Wells (Ed.), *CAS professional standards for higher education* (9th ed.). Washington, DC: Author.
- Craik, F. I. M., & Lockhart, R. S. (1972). Levels of processing: A framework for memory research. *Journal of Verbal Learning and Verbal Behavior*, 11(6), 671–684.
- Deci, E. L., & Ryan, R. M. (2008). Hedonia, eudaimonia, and well-being: An introduction. *Journal of Happiness Studies*, 9(1), 1–11.
- Demir, M., Ozen, A., & Dogan, A. (2012). Friendship, perceived mattering and happiness: A study of American and Turkish college students. *The Journal of Social Psychology*, 152(5), 659–664.
- Disabato, D. J., Goodman, F. R., Kashdan, T. B., Short, J. L., & Jarden, A. (2016). Different types of well-being? A cross-cultural examination of hedonic and eudaimonic well-being. *Psychological Assessment*, 28(5), 471–482.
- D'Mello, S., & Graesser, A. (2012). Dynamics of affective states during complex learning. *Learning and Instruction*, 22(2), 145–157.
- Engel, S. (2011). Children's need to know: Curiosity in schools. *Harvard Educational Review*, 81(4), 627–645.
- Eren, A. (2009). Examining the relationship between epistemic curiosity and achievement goals. *Eurasian Journal of Educational Research*, 36, 129–144.

- Eren, A. (2011). Prospective teachers' general epistemic curiosity and domain-specific epistemic curiosity: The mediating role of perceived instrumentality. In R. M. Teixeira (Ed.), *Higher education in a state of crisis* (pp. 163–183). New York, NY: Nova Science.
- Eren, A., & Coskun, H. (2016). Students' level of boredom, boredom coping strategies, epistemic curiosity, and graded performance. *Journal of Educational Research*, 109(6), 574–588.
- Finn, J. D. (1993). *School engagement and students at risk*. Washington, DC: National Center for Education Statistics.
- Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, 74(1), 59–109.
- Gallagher, M. W., & Marquez, S. C. (2017). Hope and the academic trajectory of college students. *Journal of Happiness Studies*, 18(2), 341–352.
- Garrosa, E., Blanco-Donoso, L. M., Carmona-Cobo, I., & Moreno-Jiménez, B. (2017). How do curiosity, meaning in life, and search for meaning predict college students' daily emotional exhaustion and engagement? *Journal of Happiness Studies*, 18(1), 17–40.
- Gilles, P. Y., & Bailleux, C. (2001). Personality traits and abilities as predictors of academic achievement. *European Journal of Psychology of Education*, 16(1), 3–15.
- Goodenow, C., & Grady, K. E. (1993). The relationship of school belonging and friends' values to academic motivation among urban adolescent students. *Journal of Experimental Education*, 62(1), 60–71.
- Grant, P., Arjoon, S., & McGhee, P. (2018). In pursuit of eudaimonia: How virtue ethics captures the self-understandings and roles of corporate directors. *Journal of Business Ethics*, 153(2), 389–406.
- Gruber, M. J., Gelman, B. D., & Ranganath, C. (2014). States of curiosity modulate hippocampus-dependent learning via the dopaminergic circuit. *Neuron*, 84(2), 486–496.
- Guthrie, J. T., & Anderson, E. (1999). Engagement in reading: Processes of motivated, strategic, knowledgeable, social readers. In J. T. Guthrie & D. E. Alvermann (Eds.), *Engaged reading: Processes, practices, and policy implications* (pp. 17–45). New York, NY: Teachers College Press.
- Harackiewicz, J. M., Barron, K. E., Tauer, J. M., & Elliot, A. J. (2002). Predicting success in college: A longitudinal study of achievement goals and ability measures as predictors of interest and performance from freshman year through graduation. *Journal of Educational Psychology*, 94(3), 562–575.
- Hardy, J. H., III, Ness, A. M., & Mecca, J. (2017). Outside the box: Epistemic curiosity as a predictor of creative problem solving and creative performance. *Personality and Individual Differences*, 104, 230–237.
- Harrison, S. H., Sluss, D. M., & Ashforth, B. E. (2011). Curiosity adapted the cat: The role of trait curiosity in newcomer adaptation. *Journal of Applied Psychology*, 96(1), 211–220.
- Hatt, S., Hannan, A., & Baxter, A. (2005). Bursaries and student success: A study of students from low-income groups at two institutions in the south west. *Higher Education Quarterly*, 59(2), 111–126.
- Herzog, S. (2007). The ecology of learning: The impact of classroom features and utilization on student academic success. *New Directions for Institutional Research*, 135, 81–106.
- Higgins, D. M., Peterson, J. B., Pihl, R. O., & Lee, A. G. M. (2007). Prefrontal cognitive ability, intelligence, big five personality, and the prediction of advanced academic and workplace performance. *Journal of Personality and Social Psychology*, 93(2), 298–319.
- Hu, A. (2015). The changing happiness-enhancing effect of a college degree under higher education expansion: Evidence from China. *Journal of Happiness Studies*, 16(3), 669–685.
- Hulme, E., Green, D. T., & Ladd, K. S. (2013). Fostering student engagement by cultivating curiosity. *New Directions for Student Services*, 143, 53–64.
- Huta, V. (2012). Linking peoples' pursuit of eudaimonia and hedonia with characteristics of their parents: Parenting styles, verbally endorsed values, and role modeling. *Journal of Happiness Studies*, 13(1), 47–61.
- Iyer, R. B. (2013). Value-based education: Professional development vital towards effective integration. *Journal of Research and Method in Education*, 1(1), 17–20.
- James, C., Koo, J., & Rodney, M. (2011, 28–29 January). Mismatches between student expectations and reality: A problem for student engagement. In: *Paper presented at the Learning in Law Annual Conference*, Warwick, England.
- Johnson, M., Crosnoe, R., & Elder, G. (2001). Students' attachment and academic engagement: The role of ethnicity. *Sociology of Education*, 74(4), 318–340.
- Kang, M. J., Hsu, M., Krajchich, I., Loewenstein, G., McClure, S., Taoyi, W. J., et al. (2009). The wick in the candle of learning: Epistemic curiosity activates reward circuitry and enhances memory. *Psychological Science*, 20(8), 963–973.
- Kashdan, T. B. (2009). *Curious? Discover the missing ingredient to a fulfilling life*. New York, NY: William Morrow.

- Kashdan, T. B., Biswas-Diener, R., & King, L. A. (2008). Reconsidering happiness: The costs of distinguishing between hedonics and eudaimonia. *The Journal of Positive Psychology*, 3(4), 219–233.
- Kashdan, T. B., Gallagher, M. W., Silvia, P. J., Winterstein, B. P., Breen, W. E., Terhar, D., et al. (2009). The curiosity and exploration inventory-II: Development, factor structure, and psychometrics. *Journal of Research in Personality*, 43(6), 987–998.
- Kashdan, T. B., Rose, P., & Fincham, F. D. (2004). Curiosity and exploration: Facilitating positive subjective experiences and personal growth opportunities. *Journal of Personality Assessment*, 82(3), 291–305.
- Kashdan, T. B., & Steger, M. F. (2007). Curiosity and pathways to well-being and meaning in life: Traits, states, and everyday behaviors. *Motivation and Emotion*, 31(3), 159–173.
- Kashdan, T. B., & Yuen, M. (2007). Whether highly curious students thrive academically depends on the learning environment of their school: A study of Hong Kong adolescents. *Motivation and Emotion*, 31(4), 260–270.
- Kelly, W. E., & Daughtry, D. (2016). The case of curiosity and the night sky: Relationship between noctcaelador and three forms of curiosity. *Education*, 137(2), 204–208.
- Kilgo, C., Ezell Sheets, J., & Pascarella, E. (2015). The link between high-impact practices and student learning: Some longitudinal evidence. *Higher Education*, 69(4), 509–525.
- Knobloch, U., Robertson, K., & Aitken, R. (2017). Experience, emotion, and eudaimonia: A consideration of tourist experiences and well-being. *Journal of Travel Research*, 56(5), 651–662.
- Koljatic, M., & Kuh, G. D. (2001). A longitudinal assessment of college student engagement in good practices in undergraduate education. *Higher Education*, 42(3), 351–371.
- Kryza-Lacombe, M., Tanzini, E., & O'Neill, S. (2018). Hedonic and eudaimonic motives: Associations with academic achievement and negative emotional states among urban college students. *Journal of Happiness Studies*, 20, 1323–1341. <https://doi.org/10.1007/s10902-018-9994-y>.
- Kuh, G. D. (2009). What student affairs professionals need to know about student engagement? *Journal of College Student Development*, 50(6), 683–706.
- Kuh, G., Cruce, T. M., Shoup, R., Kinzie, J., & Gonyea, R. (2008). Unmasking the effects of student engagement on first year college grades and persistence. *Journal of Higher Education*, 79(5), 540–563.
- Lauriola, M., Litman, J. A., Mussel, P., De Santis, R., Crowson, H. M., & Hoffman, R. R. (2015). Epistemic curiosity and self-regulation. *Personality and Individual Differences*, 83, 202–207.
- Lee, J., & Shute, V. J. (2010). Personal and social-contextual factors in K–12 academic performance: An integrative perspective on student learning. *Educational Psychologist*, 45(3), 185–202.
- Lejeune, C., Mercuri, D., Beusaert, S., & Raemdonck, I. (2016). Personal development plans supporting employee learning and perceived performance: The moderating role of self-directedness. *Human Resource Development International*, 19(4), 307–328.
- Leonard, N. H., & Harvey, M. (2007). The trait of curiosity as a predictor of emotional intelligence. *Journal of Applied Social Psychology*, 37(8), 1914–1929.
- Lewis, A. D., Huebner, E. S., Malone, P. S., & Valois, R. F. (2011). Life satisfaction and student engagement in adolescents. *Journal of Youth and Adolescence*, 40(3), 249–262.
- Litman, J. A. (2010). Relationships between measures of I- and D-type curiosity, ambiguity tolerance, and need for closure: An initial test of the wanting-liking model of information seeking. *Personality and Individual Differences*, 48(4), 397–402.
- Litman, J. A., & Jimerson, T. L. (2004). The measurement of curiosity as a feeling of deprivation. *Journal of Personality Assessment*, 82(2), 147–157.
- Litman, J. A., & Pezzo, M. V. (2007). Dimensionality of interpersonal curiosity. *Personality and Individual Differences*, 43(6), 1448–1459.
- Litman, J. A., & Silvia, P. J. (2006). The latent structure of trait curiosity: Evidence for interest and deprivation curiosity dimensions. *Journal of Personality Assessment*, 86(3), 318–328.
- Litman, J. A., & Spielberger, C. D. (2003). Measuring epistemic curiosity and its diversive and specific components. *Journal of Personality Assessment*, 80(1), 75–86.
- Lohman, M. C. (2009). A survey of factors influencing the engagement of information technology professionals in informal learning activities. *Information Technology, Learning and Performance Journal*, 25(1), 43–53.
- Louis, M. C., & Hulme, E. (2012). Thriving in the senior-year transition. In L. A. Schreiner, M. C. Louis, & D. D. Nelson (Eds.), *Thriving in transitions: A research-based approach to college student success* (pp. 167–190). Columbia, SC: University of South Carolina Press.
- Mackenzie, C. S., Karaoylas, E. C., & Starzyk, K. B. (2018). Lifespan differences in a self determination theory model of eudaimonia: A cross-sectional survey of younger, middle-aged, and older adults. *Journal of Happiness Studies*, 19(8), 2465–2487.

- Marks, H. M. (2000). Student engagement in instructional activity: Patterns in the elementary, middle, and high school years. *American Educational Research Journal*, 37(1), 153–184.
- Marques, J. (2016). Shaping morally responsible leaders: Infusing civic engagement into business ethics courses. *Journal of Business Ethics*, 135(2), 279–291.
- Mather, P. C. (2010). Positive psychology and student affairs practice: A framework of possibility. *Journal of Student Affairs Research and Practice*, 47(2), 157–173.
- Medhurst, A. R., & Albrecht, S. L. (2016). Salesperson work engagement and flow. *Qualitative Research in Organizations and Management*, 11(1), 22–45.
- Mega, C., Ronconi, L., & De Beni, R. (2014). What makes a good student? How emotions, self-regulated learning, and motivation contribute to academic achievement. *Journal of Educational Psychology*, 106(1), 121–131.
- Merino-Tejedor, E., Hontangas, P. M., & Boada-Grau, J. (2016). Career adaptability and its relation to self-regulation, career construction, and academic engagement among Spanish university students. *Journal of Vocational Behavior*, 93, 92–102.
- Michalos, A. (2017). Connecting the quality of life theory to health, well-being and education: The selected work of Alex C. Michalos. In A. Michalos (Ed.), *Education, happiness and well-being* (pp. 277–299). Berlin: Springer.
- Noftle, E., & Robins, R. (2007). Personality predictors of academic outcomes: Big five correlates of GPA and SAT scores. *Journal of Personality and Social Psychology*, 93(1), 116–130.
- Opdal, P. M. (2001). Curiosity, wonder and education seen as perspective development. *Studies in Philosophy and Education*, 20(4), 331–344.
- Ouweneel, E., Le Blanc, P. M., Schaufeli, W. B., & van Wijnhe, C. I. (2012). Good morning, good day: A diary study on positive emotions, hope, and work engagement. *Human Relations*, 65(9), 1129–1154.
- Pajares, F. (1996). Self-efficacy beliefs in achievement settings. *Review of Educational Research*, 66(4), 543–578.
- Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: A third decade of research*. San Francisco, CA: Jossey-Bass.
- Pathak, V., & Pathak, K. (2010). Reconfiguring the higher education value chain. *Management in Education*, 24(4), 166–177.
- Paulus, T. M., Horvitz, B., & Shi, M. (2006). Isn't it just like our situation? Engagement and learning in an online story-based environment. *Educational Technology Research and Development*, 54(4), 355–385.
- Poropat, A. E. (2009). A meta-analysis of the five-factor model of personality and academic performance. *Psychological Bulletin*, 135(2), 322–338.
- Randolph, K. A., Fraser, M. W., & Orthner, D. K. (2004). Educational resilience among youth at risk. *Substance Use and Misuse*, 39(5), 747–767.
- Ransome, P. (2011). Qualitative pedagogy versus instrumentalism: The antinomies of higher education learning and teaching in the United Kingdom. *Higher Education Quarterly*, 65(2), 206–223.
- Reeve, J. (2006). Extrinsic rewards and inner motivation. In C. Everston, C. M. Weinstein, & C. S. Weinstein (Eds.), *Handbook of classroom management: Research, practice and contemporary issues* (pp. 645–664). Mahwah, NJ: Erlbaum.
- Renninger, K. A., Hidi, S., & Krapp, A. (1992). *The role of interest in learning and development*. Hillsdale, NJ: Erlbaum.
- Reschly, A. L., & Christenson, S. L. (2012). Jingle, jangle and conceptual haziness: Evolution and future directions of the engagement construct. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 3–20). New York, NY: Springer.
- Richards, D. G. (2013). Eudaimonia, economics and the environment: What do the Hellenistic thinkers have to teach economists about 'the good life'? *Ethics and the Environment*, 18(2), 33–53.
- Richards, J. B., Litman, J., & Roberts, D. H. (2013). Performance characteristics of measurement instruments of epistemic curiosity in third-year medical students. *Medical Science Educator*, 23(3), 355–363.
- Riffe, D., Lacy, S., & Fico, F. G. (2005). *Analyzing media messages: Using quantitative content analysis in research* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum Association Inc.
- Rotgans, J. I., & Schmidt, H. G. (2014). Situational interest and learning: Thirst for knowledge. *Learning and Instruction*, 32, 37–50.
- Ryan, R., & Deci, E. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78.
- Ryan, R. M., Huta, V., & Deci, E. L. (2008). Living well: A self-determination theory perspective on eudaimonia. *Journal of Happiness Studies*, 9(1), 139–170.

- Ryff, C. D., & Singer, B. H. (2008). Know thyself and become what you are: A eudaimonic approach to psychological well-being. *Journal of Happiness Studies*, 9(1), 13–39.
- Sage, L., & Kavussanu, M. (2010). Moral identity and social goals predict eudaimonia in football. *Psychology of Sport and Exercise*, 11(6), 461–466.
- Salanova, M., Schaufeli, W., Martinez, I., & Bresó, E. (2010). How obstacles and facilitators predict academic performance: The mediating role of study burnout and engagement. *Anxiety Stress and Coping*, 23(1), 53–70.
- Schaufeli, W. B. (2014). What is engagement? In C. Truss, K. Alfes, A. Shantz, & E. Soane (Eds.), *Employee engagement in theory and practice edited* (pp. 15–35). Oxon: Routledge.
- Schaufeli, W. B., Salanova, M., González-romá, V., & Bakker, A. B. (2002). The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *Journal of Happiness Studies*, 3(1), 71–92.
- Schlecty, P. (1994). *Increasing student engagement*. Kansas City, MO: Missouri Leadership Academy.
- Schueller, S. M. (2013). Understanding our best: Eudaimonia's growing influence in psychology. *Quality of Life Research*, 22(10), 2661–2662.
- Sekerka, L. E., Godwin, L. N., & Charnigo, R. (2013). Motivating managers to develop their moral curiosity. *Journal of Management Development*, 33(7), 709–722.
- Shochet, I. M., Dadds, M. R., Ham, D., & Montague, R. (2006). School connectedness is an underemphasized parameter in adolescent mental health: Results of a community prediction study. *Journal of Clinical Child and Adolescent Psychology*, 35(2), 170–179.
- Silva, M. C. (2012). The scholarship of teaching as science and art. *Journal of Nursing Education*, 51(11), 599–601.
- Silvia, P. J. (2006). *Exploring the psychology of interest*. New York, NY: Oxford University Press.
- Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology*, 85(4), 571–581.
- Solomonides, I., Reid, A., & Petrocz, P. (2012). *Engaging with learning in higher education*. London: Libri.
- Soutter, A., Gilmore, A., & O'Steen, B. (2011). How do high school youths' educational experiences relate to well-being? Towards a trans-disciplinary conceptualization. *Journal of Happiness Studies*, 12(4), 591–631.
- Urquijo, I., & Extremera, N. (2017). Academic satisfaction at university: The relationship between emotional intelligence and academic engagement. *Electronic Journal of Research in Educational Psychology*, 15(3), 553–573.
- U.S. Department of Education. (2006). A test of leadership: Crafting the future of U.S. higher education. In: *A report of the commission appointed by secretary of education margaret spellings, pre-publication copy*.
- Vasalampi, K., Salmela-Aro, K., & Nurmi, J. E. (2009). Adolescents' self-concordance, school engagement, and burnout predict their educational trajectories. *European Psychologist*, 14(4), 332–341.
- Waterman, A. S., Schwartz, S. J., & Conti, R. (2008). The implications of two conceptions of happiness (hedonic enjoyment and eudaimonia) for the understanding of intrinsic motivation. *Journal of Happiness Studies*, 9(1), 41–79.
- Yang, Y. (2008). Social inequalities in happiness in the United States, 1972–2004: An age-period-cohort analysis. *American Sociological Review*, 73(2), 204–226.
- Zullig, K. J., Huebner, E. S., & Pun, S. E. (2009). Demographic correlates of domain-based life satisfaction reports of college students. *Journal of Happiness Studies*, 10(2), 229–238.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.