Psychosocial learning environments and the mediating effect of personal meaning upon Satisfaction with Education

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Abstract   This article reports the quantitative phase of a mixed-methods study that was conducted to investigate the relationships between psychosocial learning environments and student satisfaction with their education as mediated by Agentic Personal Meaning. The interdisciplinary approach of the study integrated the fields of learning environment research, existential meaning research and positive psychology research. A postulated model was tested using structural equation modeling to determine goodness-to-fit with data obtained from secondary and college students in two progressive private schools in India. Findings indicate that the learning environment variables of Teacher Support, Task Orientation, Cooperation, Student Cohesiveness, Involvement and Equity were significantly correlated with student Satisfaction with Education and with Agentic Personal Meaning. Findings also provide evidence that existential meaning and life purpose mediates the relationships between the psychosocial learning environment variables of Teacher Support, Task Orientation and Cooperation and the outcome variable of student Satisfaction with Education.

Keywords   Agentic Personal Meaning · Existential meaning · Life purpose · Psychosocial learning environments · Satisfaction with Education · Structural equation modeling · What Is Happening In this Class? (WIHIC)

Introduction

Since time immemorial, humanity has collectively strived to understand its place in the world and in the cosmos. As individuals, human beings have the important task of discovering their rightful place in society. In all places and at all times, people have sought to understand the meaning of life and the meaning behind events that affect their lives. In doing so, conscious individuals arrive at a sense of life purpose that is uplifted and informed by their sense of personal meaning. Indeed, there is abundant evidence across the

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span of human activities—in the arts, history, philosophy, politics, sociology, psychology, science and religion—that human beings are by their very nature meaning makers (Frankl 1962; Pink 2005; Reker and Chamberlain 2000).

If the search for meaning is of central importance in people's lives, then the need to foster in students a strong sense of personal meaning and life purpose through education becomes evident. Whereas life offers many opportunities for youth to develop personal meaning and life purpose—such as through involvement in family, peers, faith, community and work—schools and the educational opportunities they offer also represent highly significant sources of meaning (Benson 1997, 2002; Benson et al. 2006; Damon 2008; Hamilton et al. 2004).

Learning environment research

The field of learning environment research offers a potent framework for exploring the relationships between education and the fostering of meaning and purpose in the lives of students. Learning environment research involves the complex interrelationships between teacher and student perceptions of school psychosocial climates and student cognitive, affective and motivational outcomes (Moos 1979; Fraser 1998, 1999, 2012; Lorsbach and Jinks 1999; Taylor et al. 1997). The nature of a learning environment is influenced by the activities that teachers provide in it, the social practices and affective attitudes of teachers and learners in it, and how it is structured psychologically and physically (Fraser and Fisher 1982). How these psychological and social climate factors mutually interact and affect learner affective, attitudinal and cognitive outcomes represents the central focus in learning environment research. Some of the outcomes investigated in learning environment research include academic achievement (Johnson and Stevens 2006), attitudes towards subject areas (Dorman et al. 2006; Nix et al. 2005) and academic efficacy (Lorsbach and Jinks 1999; Kim and Lorsbach 2005).

Existential meaning and life purpose

During the second half of the twentieth century, an emergent body of research documented the study of existential meaning and life purpose, particularly in the areas of gerontology (DeVogler and Ebersole 1983; Ebersole and DeVogler-Ebersole 1985; Reker 1991, 1992, 1994, 1997, 2000; Reker and Chamberlain 2000; Reker et al. 1987; Reker and Wong 1988), holistic nursing and health (Bauer-Wo and Farran 2005) and existential, clinical, positive and social psychology (Battista and Almond 1973; Csikszentmihalyi 1990; Damon 2008; Debats 2000; Frankl 1962; Maddi 1970; Maslow 1966; Seligman and Czikszentmihalyi 2000; Yalom 1980; Zika and Chamberlain 1992). These disciplines have roots in the modern school of the existential philosophers Kierkegaard, Heidegger, Jaspers, Tolstoy and Sarte, as well as in the humanist psychology of Maslow, Rogers, Assagioli and May (Lurie 2000; Maddi 1968; Yalom 1980).

The distinctive thrust of these fields of inquiry is the exploration of the antecedent and mediating roles that the presence or lack of existential meaning plays in the lives of people who are coping with personal challenges such as aging, addictions, delinquency, divorce, psychopathology and various health issues. Where there is an existential vacuum or psychopathologies of meaning, the effects can be debilitating (Damon 2008; Frankl 1962; Maddi 1968, 1970; Yalom 1980). Conversely, where there is meaningfulness, people are better able to live healthy, productive and rewarding lives (Csikszentmihalyi 1990; Csikszentmihalyi and Csikszentmihalyi 2006; Maslow 1966, 1967; Seligman 2005; Seligman and Czikszentmihalyi 2000). Positive human functioning is enhanced through the

strengthening of subjective well-being and is limited or supported by the social and eco-
logical influences with which one lives. How one conducts oneself in choosing one's path
in life is directly related to one's sense of personal meaning comprised of one's cognitive
interpretation of life events, the motivational drives arising out of one's self-constructed
value system, and the delight of affective being, fulfillment or satisfaction that one seeks,
strives for and obtains (Reker 2000; Reker and Wong 1988, 2012).

Meaning, purpose and education

The lack of meaningful learning, teacher support and motivation during youth development
has been identified as a leading contributing factor in student alienation and failure. Mau
(1989) found that powerlessness, social isolation, and meaninglessness are four charac-
teristics of alienation among Australian high school students. Brown et al. (2003) pointed
out that the level of student alienation has been found to be associated with a number of
characteristics of school environments such as student and school culture, teacher control,
student–teacher relationships, school size and curriculum relevance. When adverse, the
effects of these conditions in schools can be devastating for students.

Personal Meaning System

For the purposes of this study, working definitions for personal meaning, life purpose and
personal agency were based on Reker and Wong's (1988) triadic structural component
model of the Personal Meaning System (PMS), provided in Fig. 1. The cognitive com-
ponent of the PMS is Personal Meaning, which is a composite construct of Purpose and
Coherence. Where there is coherence, there is a strong sense of personal identity. Where
there is life purpose, there are short and long-term personal goals, as well as a sense of
having a mission in life that serves an ideal greater than one's self. This definition is
consistent with that of Damon et al. who hold that "purpose is a stable and generalized
intention to accomplish something that is at once meaningful to the self and of
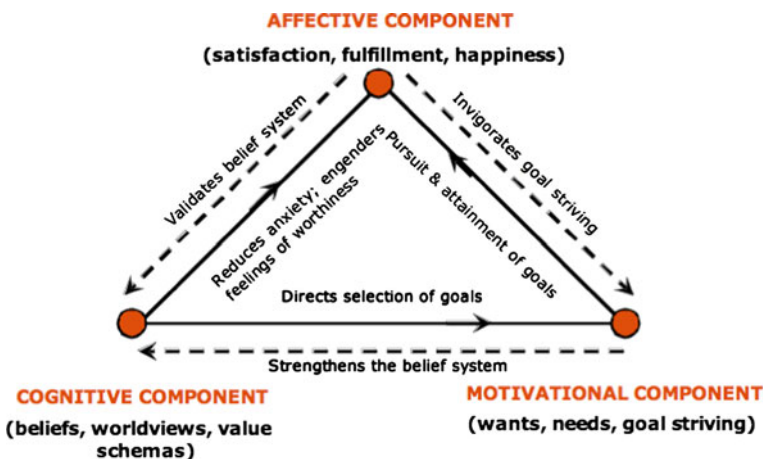

Fig. 1 Triadic model of the Personal Meaning System. *Note*: *Solid arrows* represent the direction of influence; *dashed arrows* represent feedback.

consequence to the world beyond the self" (2003, p. 121). It is possible for a person to have a strong sense of personal meaning that is comprised of purpose and coherence and yet, because of a lack of motivation, the person is unable to act upon it. Thus, in order for a person to have a strong PMS, a second component is needed. That component is agency. *Personal agency* is, therefore, the dimension that represents the motivational component of Reker and Wong's model. Personal agency consists of having a sense of control over the directionality of one's life. Where there is agency, there is a sense of freedom of choice in one's life, the intrinsic motivation to pursue meaningful activities, and the disposition to take personal responsibility for one's actions. Even with a sense of personal meaning and motivation, the Personal Meaning System can lack comprehensiveness. This is why a third, affective component of the PMS is necessary. The affective component is viewed as a value-oriented dimension of Life Satisfaction, which arises when goals are fulfilled and a life mission is pursued.

Purpose and rationale for the study

The purpose of the study was to analyse the psychosocial learning environments in two schools founded by progressive thinkers and to learn how those environments contribute to students' sense of meaning and purpose, personal agency and life satisfaction. There is a need to explore these dimensions as an essential outcome in educational research. This is because of the fact that, despite their importance in human development, there has been a dearth of inquiry into meaning and purpose in educational research, and there has never been a study within the field of learning environment research that explored the relationship between psychosocial learning environments and students' sense of life purpose and personal meaning.

Context for the study

This study was conducted within two schools in India: the Sri Aurobindo International Centre of Education (SAICE), located in Pondicherry, and the Future Foundation School (FFS) in Kolkata. These private schools have embraced and practised an approach to education known as Integral Education, which seeks to harmonise the sometime disparate aspects of the human personality such as the physical, emotional and mental beings, and to integrate these parts with the inmost self of being, a soul-principal, the *psychic being*, which is regarded as residing within each human being. To the extent that this lofty aim is achieved, the creative potential of the student is awakened and one is able to explore one's unique talents and interests and to become conscious of not only of one's self, but also of one's unique life purpose. The cardinal aim of the Integral approach to education, then, is the discovery and living out of one's life purpose. In 1950, Mirra Alfassa, the founder of SAICE, succinctly shared this idea with the teachers and students at the school:

> An aimless life is always a miserable life. Everyone one of you should have an aim. But do not forget that the quality of your life will depend upon the quality of your aim. Your aim should be high and wide, generous and disinterested; this will make your life precious to yourself and to others. [Translation by author] (Alfassa 1950, p. 3)

She goes on to say that, to do so, one must develop personal mastery over one's nature by cultivating self-knowledge and self-discipline, discovering one's unique capacities, and finding meaning in one's life.

The schools were thus selected for this study because their educational programs expressly seek to promote the development of meaning and life purpose among their students. In addition to emphasising traditional academics and the performing, visual and liberal arts, the Integral approach to education in these schools stress the development of self-awareness and higher consciousness. That is, students are taught and inspired to become active co-creators in a rapidly changing world. These schools, moreover, are highly successful in that they have created and maintained educational programs that have stood the test of time. Their graduates are known to have moved on to successful lives and careers, with many eventually sending their own children to their respective alma mater.

Research questions and hypotheses

This study tested four hypotheses, addressing three research questions, using a variety of statistical analyses. A summary of the research questions, hypotheses and tests are provided in Table 1. The hypothesis on the relationships between student perceptions of their psychosocial learning environments, their attitudes towards life and Satisfaction with Education, as well as a second question related specifically to the life attitude composite

Table 1 Description of data analyses for testing each of the study's hypotheses

Research question	Hypothesis	Data collection	Data analyses
1. What are the relationships between students' perceptions of their school psychosocial learning environments and their satisfaction with their education?	1a. The learning environment is related to the observed variables of purpose, coherence, personal agency and Satisfaction with Education.	Student survey on learning environments, life attitudes and satisfaction	Simple bivariate correlation
	1b. In these schools, there is evidence supporting the presence of Agentic Personal Meaning and Satisfaction with Education.	Student survey on learning environments, life attitudes and satisfaction	Scale statistics
2. What differences do the data reveal between SAICE and FFS?	2. There is no difference between the two Indian schools with respect to the relationships between the variables	Student survey on learning environments, life attitudes and satisfaction	Independent sample t test
			Kenny test
			Multiple regression using interaction terms
3. Do the data provide support for the mediating effect of Agentic Personal Meaning upon the relationships between student perceptions of the psychosocial learning environments in their schools and their self-report of Satisfaction with Education?	3. There is evidence of that Agentic Personal Meaning mediates the relationship between psychosocial learning environments and student Satisfaction with Education in these schools.	Student survey on learning environments, life attitudes and satisfaction	Structural equation modeling

construct, Agentic Personal Meaning (APM), were analysed using bivariate correlations and scale statistics. With the exception of the testing of structural equation models, all the statistical tests for this study were conducted using SPSS.

Survey instrument and variables

The survey used to explore the quantitative questions was a composite instrument comprised of selected scales from three reliable and validated instruments that have been extensively used in previous research with school age students and with at-risk populations. Table 2 provides descriptive information for the variables analyzed in the study.

Table 2 Descriptive information for the WIHIC, LAP–R, and SWES

Scale	Scale descriptions	Domains and constructs
Observed independent variables: learning environment—WIHIC		
Student Cohesiveness	The extent to which students know, help and are supportive of one another	Relationship Domain
Teacher Support	The extent to which the teacher helps, befriends, trusts and is interested in students	Relationship Domain
Involvement	The extent to which students have attentive interest, participate in discussions, do additional work and enjoy the class	Relationship Domain
Task Orientation	The extent to which it is important to students to stay on task and complete school work	Personal Development Domain
Cooperation	The extent to which students co-operate rather than compete with one another on learning tasks	Personal Development Domain
Equity	The extent to which students feel their teachers treat them equally	System Maintenance and Change Domain
Observed dependent and mediating variables: Personal Meaning System—LAP–R and Modified SWLS (SWES)		
LAP–R—Purpose	A sense of direction from the past, in the present, and toward the future. Purpose provides thrust and direction to one's life.	Cognitive Component: Global Personal Meaning, Agentic Personal Meaning, and Personal Meaning System
LAP–R—Coherence	A sense of order and reason for existence, a sense of personal identity, and greater social consciousness	Cognitive Component: Global Personal Meaning, Agentic Personal Meaning, and Personal Meaning System
LAP–R—choice/ responsibleness (Agency)	An operational index of the degree to which a person perceives having personal agency in directing his or her life	Motivational component: Agentic Personal Meaning and Personal Meaning System
Observed outcome variable		
SWES—Satisfaction with Education	Extent to which one is satisfied with one's educational experiences in school	Affective Component: Personal Meaning System

A modified version of the What Is Happening In this Class? (WIHIC) questionnaire constituted the first part of the online student survey. This instrument was chosen for this study because it has demonstrated robust scale validity and reliability (Dorman 2001; Dorman et al. 2006), has been utilized in cross-national studies (Dorman 2003; Dorman et al. 2003), and measures useful variables that have been correlated with a number of outcome variables in past learning environment research. The WIHIC thus been proven to be a reliable instrument to specifically measure meaningful aspects of psychosocial environments in schools. For the purposes of this study, the WIHIC was modified for a school-level analysis rather than an individual classroom-level analysis. That is, instead of framing the questions by using the phrase "In this class…", the modified versions reads "In this school…" and instead of the phrase "My teacher…", the modified version reads "My teacher(s)…").

The second part of the on-line survey was made up of scales from Reker's (1992) Life Attitude Profile—Revised (LAP–R). The first of the three LAP–R scales used in this study represented the dimension of Coherence, consisting of a "logically integrated and consistent analytical and intuitive understanding of self, others, and life in general" (Reker 1992, p. 15). Coherence embraces a sense of order, reason for existence and personal identity and a strong social awareness. Next, the dimension of Purpose refers to when a person has sense of a mission in life that gives him or her direction from the past, in the present, and towards the future. Such a mission would be of central importance in one's life. Coherence and Purpose constitutes the cognitive component of Reker and Wong's (1988) Structural Component Model of the Personal Meaning System. The third LAP–R scale used in the study is Choice/Responsibleness, which is a measure of personal agency in which a person has a positive attitude regarding his or her ability to take personal responsibility for decisions and to freely direct his or her life. Where there is Choice/Responsibleness, there is a strong motivation to exercise personal mastery in one's life and achieve one's aims. This dimension represents the motivational component of the Structural Component Model of the Personal Meaning System. These three LAP–R dimensions were computed and employed as a mediating latent variable: Agentic Personal Meaning (APM). This construct is a global measure pertaining to ultimate concerns and attitudes towards life. This is an important composite construct because it has been observed that having a sense of personal meaning is not sufficient for a person to fulfill his or her life purpose unless that person also has a strong sense of efficacy that carries with it the motivation to exercise personal agency.

A modified domain-specific version of the Satisfaction With Life Scale (SWLS; Diener et al. 1985; Pavot and Diener 1985, 1993, 2008), the Satisfaction with Education Scale (SWES), was designed to measure Satisfaction with Education and it constituted the third part of the composite online student survey. This variable represents the outcome variable in this study. For the purpose of this study the SWES variable is referred to as Satisfaction with Education.

Instrument reliability and validity

The student survey was a composite of three instruments that had been validated and tested for reliability in previous research: the What Is Happening In Class? questionnaire (WIHIC), the Life Attitude Profile—Revised (LAP–R) and a modified version of the Satisfaction With Life Scale (SWLS) that was contextualised for Satisfaction with Education (SWES). Table 3 provides data from this study about the reliability and internal consistency of these instruments, as well as the scale mean and the standard deviation of each variable. Cronbach α reliability coefficients for each variable exceeded 0.80, with the exception of Task Orientation ($\alpha = 0.77$), which is still well over the 0.70 threshold

Table 3 Internal consistency reliability, scale mean and scale standard deviation for six learning environment scales, five LAP–R Scales and one Outcome Scale (SAICE–FFS)

Scale	α	Mean	SD
Independent variables (WIHIC)			
Student cohesiveness	0.83	4.04	0.59
Teacher support	0.89	3.41	0.83
Cooperation	0.86	3.40	0.70
Involvement	0.85	4.18	0.72
Task orientation	0.77	3.85	0.56
Equity	0.94	3.87	0.99
Intervening variables (LAP–R)			
Purpose	0.82	5.15	0.96
Coherence	0.86	5.18	1.02
Choice/responsibleness (Agency)	0.83	5.45	1.02
Personal Meaning Index (PMI)	0.90	5.17	0.91
Agentic Personal Meaning (API)	0.91	5.21	0.84
Outcome variable			
Satisfaction with education	0.90	4.88	1.41

$N = 267$

required for sufficient scale reliability. Lamba scores exceeding 0.90 for each scale reveal good internal consistency for all scales.

Factor analyses for the three measures were computed. The six factors of the WIHIC explained 55.27 % of the variance, the three factors of the LAP–R explained 50.6 % of the variance, and the two scales for Satisfaction with Education and Life explained 52.95 and 14.93 %, respectively. Interestingly, seven of the eight items of the WIHIC variable for Teacher Support cross-loaded with the items for Equity. Given that the factor loadings for seven of the eight items for Teacher Support were greater than 0.30, and in accordance with past research and the theoretical framework of this study, the factor structure of WIHIC scales was retained for the purposes of this analysis.

Confirmatory factor analysis, multiple regression analysis and structural equation modeling

Structural equation modeling is a form of statistical testing that integrates factor analysis and multiple regression analysis in a simultaneous model extraction. It provides for the testing of goodness-to-fit between a postulated model and sample data, with results presented graphically in terms of the path coefficients among and between observed and latent variables. Specific items from research instruments are considered observed variables because they directly assess survey respondents' reporting of their perceptions or experiences of specific phenomena. When a factor structure computed for a set of observed variables is found to be reliable, that structure inferentially represents a theoretical construct that, for purposes of analysis, is referred to as a latent variable. Observed and latent variables can be used in a hypothesised model as independent (antecedent), intervening (mediating) or outcome (consequent) variables.

Postulated structural model

Figure 2 illustrates the hypothesised model tested using the data obtained in this study. The model depicts a series of path coefficients between the variables measured. Essentially, the model postulates relationships between the latent psychosocial learning environment variables, Agentic Personal Meaning and Satisfaction with Education. Additionally, the model postulates that Agentic Personal Meaning mediates the relationship between learning environment and satisfaction. The learning environment variables are therefore the independent variables, Satisfaction with Education is the dependent variable, and Agentic Personal Meaning is a latent dependent variable (in relation to learning environments), an independent variable (in relation to Satisfaction), and a mediating variable between learning environment and Satisfaction. In the SEM analysis, all of these relationships were computed simultaneously to check the goodness-to-fit of the postulated model to the data.

Participants

All students attending two schools, and in the grade/standard levels studied, were provided with information fliers about the research project, and all who participated did so confidentially. Table 5 provides data about the participants who completed the online student survey in its entirety. A total of 32 respondents did not complete the survey items related to the dependent variable, Satisfaction with Education. In order to retain a more complete data set and to eliminate the need to estimate the scores for the missing data on this critical variable, those 32 cases were deleted from the data set. Moreover, as explained below, an
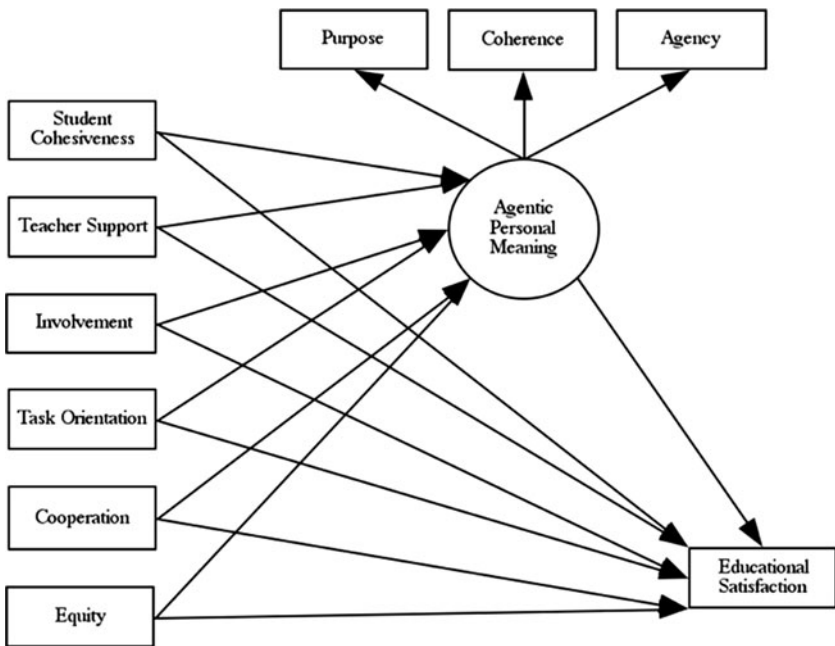

Fig. 2 Postulated model of APM as a mediator between psychosocial learning environments and Satisfaction with Education

Table 4 Population size (number of respondents) for each school

School	Year level						Total		
	10	11	12	13	14	15			
	N (n)	N (n)	N (n)	N (n)	N (n)	N (n)	N	(n)	%
FFS	69 (52)	106 (95)	72 (32)	–	–	–	247	(179)	0.72
SAICE	19 (13)	36 (12)	23 (14)	20 (13)	28 (19)	28 (17)	154	(88)	0.57
							401	(267)	0.67

additional six cases with multivariate outliers were removed. The figures reported in Table 4 exclude these dropped cases. This yielded a total of 267 completed surveys from SAICE and FFS, with a total response rate of 67 %. Of these, 218 students were in grades 10, 11 and 12 (ages 16–18 years) and 49 students (ranging in ages from 19 to 21 years) were in the Higher Course (undergraduate level) Program of SAICE. Interestingly, a large number of these students had attended their respective school for 5–10 or more years. In order to see if there were any differences in the results between the entire data set and the data from students attending for five or more years, separate analyses were conducted that revealed no major differences. Therefore, the findings reported here include all students, regardless of how long they attended their school.

Identification of outliers and checks for violation of assumptions

After checking the survey instrument scales for validity and reliability, the data were explored to identify potential outliers and check for assumptions required prior to conducting further statistical analyses for the study. Box plots generated for each variable revealed the presence of six multivariate and 18 univariate outliers. Whereas the respondents with the univariate outliers were retained in the data set, the respondents with the six multivariate outliers were deleted. Regressions for two data sets, with and without the multivariate outliers, revealed no major impact on the results. Therefore, in order to retain a 'cleaner' data set for this study, all subsequent analyses were conducted using the data set without these outliers, with the final number of cases as reported in Table 4.

The first assumption to consider in multiple regression analysis is sample size. According to Tabachnick and Fidell (2001, p. 123), the ratio of cases to independent variables should be $N \geq 50 + 8m$ (where m is the number of independent variables). Given the six independent variables in this study, the sample size should be at least 98 cases. Given that the sample size for SAICE was only 88, there is some cause for concern for the disaggregated analysis for this school. However, as revealed later, only two of the six independent variables were ultimately factored into the equations for this school, thus eliminating this concern.

In order to check for any remaining violation of assumptions, a series of multiple regressions were run on the aggregate data (i.e. including both schools) and disaggregated data (the two schools separately) with Satisfaction with Education as the dependent variable. Among the independent variables, only Equity and Teacher Support revealed a correlation greater than 0.70, as would be expected in the light of the factor analysis reported above. However, the collinearity statistics were well within the acceptable ranges for tolerance (>0.10) and the VIF (<10.0). Thus, the assumption of the absence of multicollinearity was verified by the data. An examination of the residual scatter plots showed no evidence of deviation from the assumptions of normality, linearity and homoscedasticity.

Results

Research Question 1: Relationships between students' perceptions of their school psychosocial learning environments and their satisfaction with their education

The first research question for study was explored through the testing of two hypotheses. First, Hypothesis 1a, which addresses the relationship between the independent variables and the mediating and dependent variables, was explored in order to test whether student perceptions of their psychosocial learning environments were related to their attitudes towards life and their satisfaction with their education in their school. As can be seen in Table 5, all the psychosocial learning environment variables were correlated with the three LAP–R variables of Purpose, Coherence and Choice and Responsibleness (Agency), as well as with Satisfaction with Education. All correlations were found be significant. Hypothesis 1b concerns the presence of a sense of Agentic Personal Meaning among the students in these schools. The reported means for Purpose, Coherence and Choice and Responsibleness (Agency) were 5.15, 5.18 and 5.45, respectively. The mean for the composite construct, Agentic Personal Meaning, was 5.21. The mean for Satisfaction with Education was 4.88. Translated into the actual responses, a score of 4.0 represents Undecided, 5.0 represents Moderately Agree and 6.0 represents Agree.

These findings suggest that the two hypotheses for this question should not be rejected. First, the learning environment variables were statistically significantly correlated with the observed variables of Purpose, Coherence, Agency and Satisfaction with Education. Second, the data provides evidence that students in these schools have a sense of purpose and meaning, feel confident that they can take responsibility for fulfilling their respective life purposes, and are moderately satisfied with their education.

Research Question 2: Differences between schools SAICE and FFS

In order to test Hypothesis 2 for the differences between the two schools, I undertook the series of tests in Table 6. Independent sample t tests revealed that three variables were significantly different between the schools: Involvement, Cooperation and Equity. However, effect sizes for Involvement and Equity were small, while the effect size for Cooperation was moderate to high (Pallant 2005). In order to further explore these effects, a test suggested by Kenny (1987, pp. 284–285) for the comparison of two independent regression coefficients

Table 5 Correlations between psychosocial learning environment variables and the intervening and outcome variables (SAICE–FFS)

Learning environment scale	Correlation			
	Purpose	Coherence	Choice and responsibleness	Satisfaction with Education
Student Cohesiveness	0.37**	0.30**	0.20**	0.25**
Teacher Support	0.48**	0.35**	0.31**	0.62**
Involvement	0.31**	0.22**	0.31**	0.43**
Task Orientation	0.51**	0.42**	0.26**	0.47**
Cooperation	0.40**	0.34**	0.14*	0.15*
Equity	0.41**	0.21**	0.26**	0.55**

* $p < 0.05$; ** $p < 0.001$; $N = 267$

Table 6 Independent-sample Kenny test and t test for assessment of independent variable differences between SAICE and FFS, with effect sizes (eta^2)

Learning environment scale	Association with Satisfaction with Education								
	FFS ($n = 179$)			SAICE ($n = 88$)			$t_{(n1+n2-4)}$	t	Eta^2
	b	SE b	β	b	SE b	β			
Student Cohesiveness	0.36	0.17	0.16*	−0.50	0.24	−0.22*	0.21	1.39	0.01
Teacher Support	0.55	0.16	0.33**	0.60	0.17	0.38**	0.66	−1.95	0.01
Task Orientation	0.64	0.16	0.26**	0.17	0.23	0.08	N/A	−1.79	0.01
Involvement	0.07	0.15	0.04	−0.00	0.19	−0.002	N/A	−3.16**	0.04
Cooperation	0.15	0.17	−0.07	0.15	0.17	0.09	0.02	5.61**	0.11
Equity	0.19	0.12	0.14	0.55	0.16	0.39**	0.002	−2.32*	0.02

* $p < 0.05$; ** $p < 0.01$; $N = 267$

was computed. Additionally, a series of multiple regressions using interaction terms was run, with the nonsignificant interaction terms deleted for subsequent runs of the test. The final test provided further evidence that there were significant differences between the two schools with respect to the relationship between Cooperation and Satisfaction with Education. The remaining learning environment variables had small effect sizes and were not found to be significant in the regressions using interaction terms. Therefore, the hypothesis that there would be no differences between the schools was accepted, except with respect to the relationship between Cooperation and Satisfaction with Education.

Research Question 3: Mediating effect of Agentic Personal Meaning upon relationships between student perceptions of school psychosocial learning environments and their self-report of Satisfaction with Education

The results of the multiple regression analysis for Hypothesis 2 for Research Question 2 were used to select the independent variables included in the structural equation models tested for Hypothesis 3, which addresses the third research question regarding the mediating effect of Agentic Personal Meaning upon the relationship between learning environments and student Satisfaction with Education. According to Baron and Kenny (1986), certain conditions must exist for the testing of a model of mediation. First, the independent variables must be correlated with the dependent variable and the mediating variable and, second, the mediating variable must be correlated with the dependent variable. To establish these conditions, simple bivariate correlations were calculated between all the variables and are reported in Table 5.

Hypothesis 3, which addresses this research question, involves whether the relationship between student perceptions of their psychosocial learning environment and their Satisfaction with Education are mediated by their sense of Agentic Personal Meaning. To explore this hypothesis, multiple regressions were run on the data, and then the postulated model was tested using SEM for the aggregated data, followed by tests of each school separately. Tabachnick and Fidell (2001) point out that SEM, which is based on covariances, is highly sensitive to sample size. As a rule of thumb, this means that, for every covariance tested in a model, at least 10 cases are required. Therefore, for the purposes of this analysis, and given the number of cases in the data set, parsimonious models needed to be specified in order to test for

Table 7 Results of multiple regression analyses for prediction of one outcome variable by significant psychosocial learning environment variables—SAICE and FFS

Outcome	R^2	Predictor	b	SE_b	β
Satisfaction with Education	0.47	Teacher Support	0.66	0.12	0.39**
		Task Orientation	0.53	0.13	0.21**
		Equity	0.29	0.09	0.20*
Satisfaction with Education	0.44	Teacher Support	0.89	0.09	0.53**
		Task Orientation	0.57	0.13	0.23**

* $p < 0.05$; ** $p < 0.01$; $N = 267$

goodness-to-fit, especially for the SAICE data. Another important consideration in SEM is identification. According to Byrne (2006, p. 32) any specified model must be over-identified, which means that the estimable parameters cannot exceed the number of data points. She provides a formula for calculating for identification: $p(p + 1)/2$. All three models reported in this study met the requirement of over-identification.

The selection of variables for the aggregated analysis was determined by the multiple regressions, which are shown in Table 7. After eliminating the nonsignificant variables from the equation, a model with the predictors of Teacher Support, Task Orientation and Equity was tested. As a result, it was found that the total variance in Satisfaction with Education explained was 47.1 %, $F(3, 263) = 74.869$, $p < 0.001$. Next, given the high Pearson correlation between Teacher Support and Equity (0.723), Equity was dropped from the model. The final regression revealed that 44.1 % of the variance in Satisfaction with Education was explained by Teacher Support and Task Orientation, $F(2, 264) = 104.275$, $p < 0.001$. These variables were then used in the SEM analysis.

Figure 3 provides the results of the SEM analysis of the aggregated data from both schools for testing the mediating effect of Agentic Personal Meaning upon the relationship between the independent variables, Teacher Support and Task Orientation, and the dependent variable of Satisfaction with Education. According to Byrne (2006), in order to establish goodness-of-fit of a model to data, the Comparative Fit Index (CFI), Normed Fit Index (NFI) and the Goodness to Fit Index (GFI) should all be greater than 0.90, with scores of 1.00 indicating perfect fit. The Root Mean Square Error of Approximation (RMSEA) should be below 0.08, and fall between the range indicated by the 90 % Confidence Interval of RMSEA. Cronbach's alpha coefficient should be at least 0.70. For this specified model, all model fit indices indicate excellent fit of the data to the model.

Figures for the mediating effect of Agentic Personal Meaning are shown in the path coefficients for the mediated model, with the direct path coefficients in parentheses. The z-scores for the decomposition effects of nonstandardised parameters, and the probability values for the mediation effect, are also provided. When the mediated coefficients drop to, or near to zero, it can be concluded that the relationship between the IVs and DV are fully mediated by the MV. In the SAICE-FFS model it can therefore be concluded that the relationships of Teacher Support and Task Orientation with Satisfaction with Education are partially mediated by Agentic Personal Meaning.

The mediating effect upon both IVs was significant ($p < 0.001$), thus supporting Hypothesis 3 that a mediation effect exists in these schools.

Analysis of the disaggregated data led to two specified models, one for each school, shown in Figs. 4 (SAICE) and 5 (FFS). For SAICE, the model fit indices were all greater than 0.90, with a high RMSEA of 0.118 that still falls within the 90 % confidence interval.
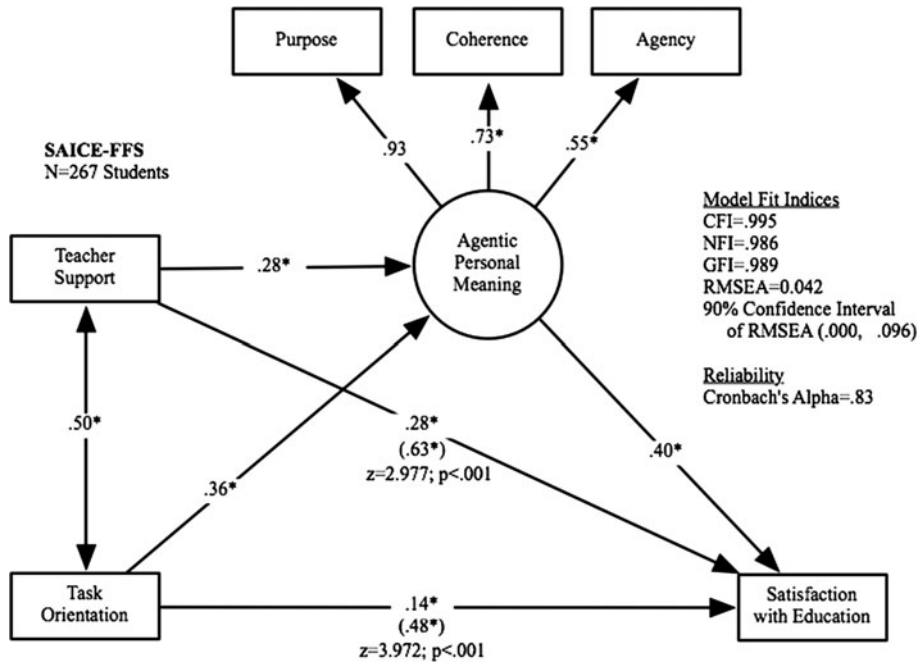
Fig. 3 Mediating effect of Agentic Personal Meaning upon the relationships between Teacher Support/ Task Orientation and Satisfaction with Education in SAICE and FFS. (Path coefficients in parentheses represent the direct path coefficients between the variables. The mediation effect of Agentic Personal Meaning is indicated by z scores and p values)

With a mediated coefficient of 0.000 for Task Orientation and Satisfaction with Education, the data indicate that the relationship between these variables was fully mediated by Agentic Personal Meaning. The relationship between Teacher Support and Satisfaction was partially mediated. Both mediating effects were significant ($p < 0.015$). For FFS, the specified model included an additional IV, Cooperation. The model fit indices also were all greater than 0.90, with a better RMSEA (0.055) than for SAICE, which fell within the 90 % confidence interval. With a mediated coefficient of −0.10 for Cooperation and Satisfaction with Education, Agentic Personal Meaning fully, and even negatively, mediated the relationship between these variables. The relationships between the remaining IVs, Teacher Support and Task Orientation, and Satisfaction were partially mediated. All mediating effects were significant ($p < 0.002$).

Discussion

This study has a number of important conclusions, which support past research in the three fields that informed this interdisciplinary study.

Learning environment research

Consistent with previous learning environment research, this study provides further evidence that the psychosocial learning environment variables measured using the WIHIC
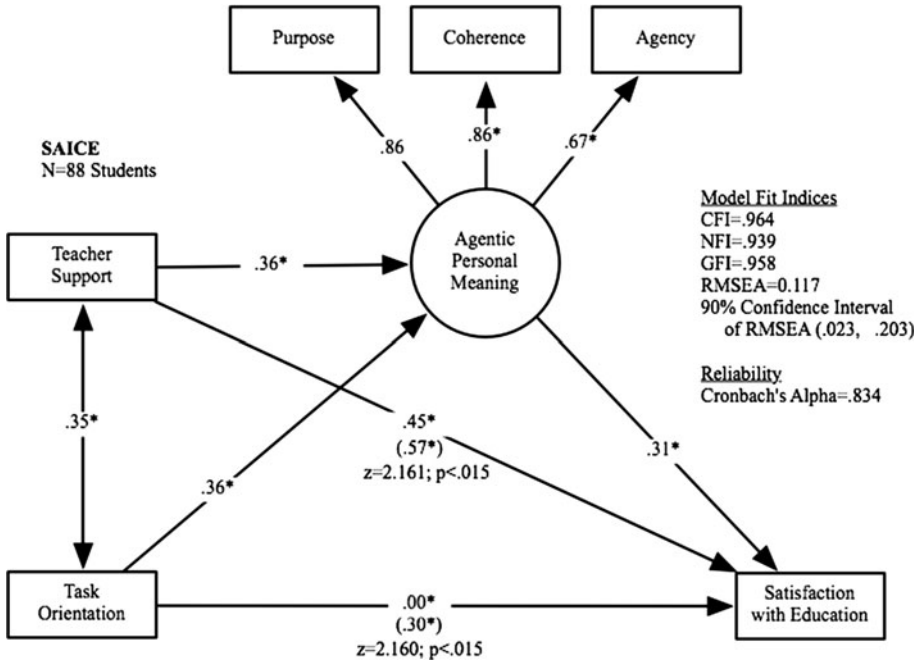
Fig. 4 Mediating effect of Agentic Personal Meaning upon the relationships between Teacher Support/Task Orientation and Satisfaction with Education in SAICE
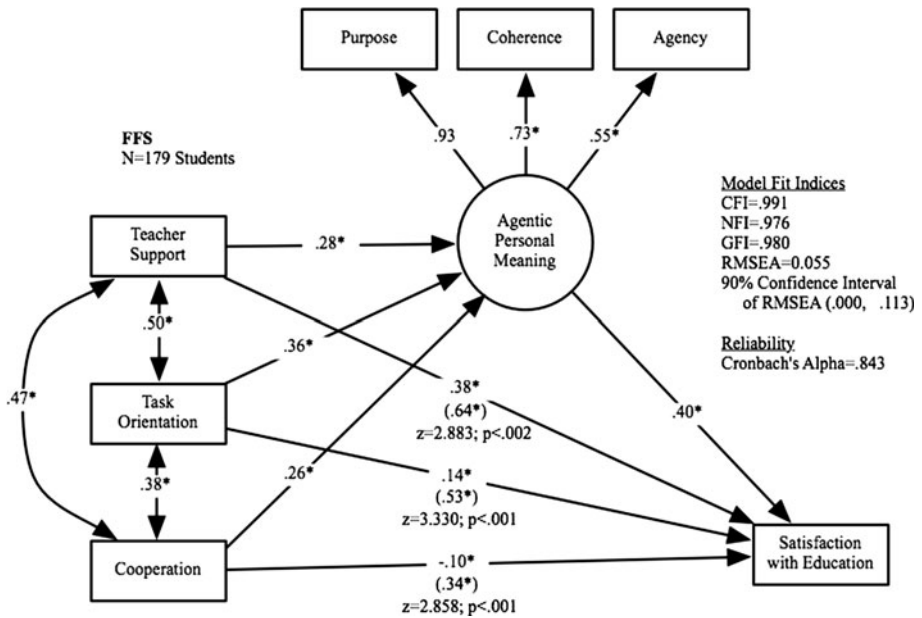

Fig. 5 Mediating effect of Agentic Personal Meaning upon the relationships between Teacher Support/Task Orientation/Cooperation and Satisfaction with Education in FFS

are correlated with student affective, cognitive and motivational outcomes (Allen and Fraser 2007; Fraser 1998; Fraser and Fisher 1982; Henderson et al. 2000; Moos and Trickett 1974; Shavelson and Seidel 2006; Trickett 1978; Walberg and Anderson 1968). All of the psychosocial learning environment variables were found to have significant relationships with the cognitive components of APM (Purpose and Coherence), the motivational component of APM (Agency) and the affective variable of Satisfaction with Education. This line of research has been important particularly because creating learning environments is precisely what leaders in education do.

Second, data reflect the critical–constructivist orientation that represents an important theoretical foundation for learning environment research. The relationships between meaning and meaning-making, self-knowledge and the express aim of drawing forth from within each student his or her highest potential that were found in these schools can be understood in light of Taylor et al. (1995) description of the critical constructivist orientation:

> Critical theory draws to our attention the ways in which the social environment constrains the teacher and students to act in accordance with political agenda whose interests can be antithetical to good meaning-making and ethical social interactions. Whereas constructivism entails an *instrumentalist ethic*—knowledge is valued because it works, or is viable—critical theory challenges us to adopt a *discourse ethic* that values (self-) knowledge for its potential to enable us to communicate openly and richly, thereby realizing the full potential of our species' most distinctive attribute. (p. 2)

The close relationships between and among teachers and students in these schools offer countless opportunities for such a discourse ethic to be put into practice. Indeed, the evidence suggests that, in these schools, teachers and students are on a more equal footing and collaborate as co-learners in a co-creative learning process.

Finally, the schools participating in this study were in alignment with the aims of learning environment research as stated by Moos: "It is in these endeavors that we adhere most closely to the founding vision of our field: Active participation in the process of social construction with the goal of enhancing personal relationships, task fulfillment, and social change" (Moos 2003, p. 10). This field of research explores how human beings interact with, adapt to, and seek to actively change their environment.

Existential meaning research

The extensive findings arising from existential meaning research that have indicated that the search for and attainment of meaning supports the healing process of people suffering from a variety of challenges have now been extended, for the first time, into the area of educational research. The data from this study support the findings of Fry (1998), indicating that young people report intrinsic desires for self-knowledge, Personal Meaning Systems with embedded life purposes, as well as self-management, self-efficacy and self-esteem. According to Fry:

> …not only are most adolescents intellectually and emotionally ready to explore the personal meanings of their life, but they are also ready to explore their actions or strivings in the context of a futuristic perspective, or in the context of a connectedness to a larger populace. In this sense, therefore, although the development of personal meaning and wisdom is a lifelong evolutionary process, the potential for

both personal meaning and wisdom is remarkably evident during adolescence (pp. 92–93).

An important concept guiding this study was Reker and Wong's (1988) Personal Meaning System (PMS), which integrates cognitive and motivational components of meaning and purpose. That is, it is not enough for a person to have a sense of purpose and corresponding coherence for meaning, but those with a sense of purpose and meaning also need to be motivated to exercise personal responsibility and make choices that serve their purpose. But even then, the cognitive and motivational components of the PMS are not sufficient. That is, a comprehensive PMS would include purpose, meaning, agency and an affective component of satisfaction or fulfillment. Evidence from this study indicates that the participating schools fostered in students the components of Agentic Personal Meaning, as well as Satisfaction with Education, which suggests that, for these students, the PMS is broadly well-developed.

Additionally, Reker and Wong's (1988) reconciling of the dichotomy between the ontological and phenomenological views of existential meaning provides greater under-standing of the learning environments in these schools. That is, these schools expressly provide learning environments that integrate specific educational activities "into a larger and higher purpose, as expressed through philosophical understanding and spiritual con-nectedness, from which meaning can be discovered" (Reker 2000, p. 41). As sources of meaning, these schools offer opportunities for students to discover global meaning through a reflection on the givens of life, as well as to create situational meaning by making choices, acting and relating with others.

Next, a key concept stemming from existential and humanistic psychology is the idea of what Frankl (1962) called the *will to meaning*. Much of what these schools do involves fostering in students the disposition to seek out and find meaning in their lives, and to see their lives as part of a greater stream of consciousness that can impact the world. Speaking of logotherapy, Reker (1994) wrote:

> The highest goal of most traditional therapies is the achievement of a fully integrated person, but they do little to moving the individual to a higher level of awareness. Logotherapy focuses on conscious experiences, accesses higher levels of con-sciousness, and is holistic by awakening the analytic and the creative sides of the brain. (p. 54)

As previously discussed, this focus on self-awareness and the development of higher consciousness is an integral part of the educational paradigm for these schools. These schools posit the development and evolution of consciousness in human beings as an important component in the process of developing self-mastery, which shares a reciprocal relationship with the will to meaning.

Finally, the theory that meaning impacts on human functioning and healthy human development has been supported by this study, which has posited Agentic Personal Meaning as an important mediator in the relationship between psychosocial learning environments and students' sense of subjective well-being as expressed by their satisfac-tion with their education.

Positive psychology and positive youth development

Research in the fields of positive psychology and positive youth development can assist in understanding the role of subjective well-being and identity development in these schools.

As Seligman and Czikszentmihalyi (2000) pointed out, the "field of positive psychology at the subjective level is about valued subjective experiences: well-being, contentment, and satisfaction (in the past); hope and optimism (for the future); and flow and happiness (in the present)" (p. 5). The experiences of students in these schools reflect this orientation by offering extensive teacher support and freedom to explore gifts and talents, as well as by instilling in students a strong sense that the aim of life is to find joy in work and service that "is at once meaningful to the self and of consequence to the world beyond the self" (Damon et al. 2003, p. 121). Additionally, evidence from this study corroborates findings in these areas of research that a sense of purpose is an important developmental asset that promotes identity development (Benson et al. 2006; Damon 1995, 2008; Hamilton et al. 2004; Larson 2000). This study extends the study of life satisfaction, which has been found to be correlated with numerous personality and emotion variables (Pavot and Diener 2008), into the field of education by revealing that Satisfaction with Education is correlated with variables studied by learning environment researchers.

Implications for theory

This study extends the theoretical implications of the role of meaning and purpose in the context of education. Human beings are by nature meaning makers. Moreover, ample evidence from the fields of existential meaning research and positive psychology indicates that human beings with a strong sense of purpose, supported by a worldview that life is inherently meaningful, are better able to cope with the shocks and blows of life and lead healthy and productive lives. The application of theories of meaning and purpose in the field of education research can thus inform our understanding of how to achieve needed changes in schools.

The mediating construct employed in the SEM analysis for this study, Agentic Personal Meaning, consists of three critical components that support the development of a comprehensive Personal Meaning System (Reker and Wong 1988): purpose, coherence for meaning, and choice and responsibleness (agency). While past theorists tended to collapse meaning and purpose into a single construct (Frankl 1962), others emphasise the distinction between the two with regards to the developmental role of intentionality in human functioning (Damon et al. 2003; Reker and Wong 1988; Yalom 1980). That is, while meaning is essentially a global orientation related to the value of one's personal identity with regards to self and others, purpose provides direction at various stages in life that assists one in navigating the challenges that life presents. The ability to confidently make choices and take personal responsibility for one's choices facilitates one's creative endeavors in the pursuit of self-actualisation and self-transcendence. For students, these ideas have the potential to not only spark in them the urge to seek and find their place in the world and in society, but to do so with the view of participating in the creation of a new society.

When educators seek to promote meaning and purpose in the lives of students through freedom of opportunities, choice and personal responsibility, rather than subsuming their needs to the command and control structures of the industrial worldview, students will be more likely to seek out avenues for creative endeavours that serve a wider existential aim in life. In doing so, they are more likely to access and realise their potential to become co-creators within an evolving world grounded in social justice.

Limitations of the study

There were a number of limitations to this study. First, although the WIHIC questionnaire was originally designed for use in individual classrooms, it was modified it to embrace a school-level analysis of relatively small schools in this study. As a result, there could be some issues regarding the validity of using the WIHIC in this modified form. In subsequent research, a new school-level learning environment survey may need to be developed to explore the relationships between psychosocial learning environments and the outcome and intervening variables used in this study. Next, given the small student populations of the schools studied, and given the philosophical orientation of the educational paradigm found in these schools, there are some questions about the generalisability of the findings. The validity and applicability of the findings could be limited to schools that are unusually small in size. However, the use of SEM analysis makes possible the exploration of these variables in larger, more mainstream contexts in which models such as those tested here can be investigated. SEM allows the analysis of models positing relationships between the variables that might reveal more generalised findings among a variety of school contexts. That is, there could be more generalised findings to be discovered in future learning environment and educational research, given that the constructs tested here are theorised to have a profound relationships with people living under a variety of conditions within the human experience. Research emphasis on investigating these constructs in the light of students' experiences in a variety of learning environment contexts thus might yield useful findings that address the limitations of this study.

Contributions of the study

This study provided several important contributions to the research literature. First, it was the first to analyse the role of existential meaning and life purpose in the context of educational research, thus addressing a critical gap in the research literature. More specifically, this was the first study within the field of learning environment research that took up existential meaning and purpose as an outcome and mediating variable. Second, from a methodological standpoint, this study addressed a gap in the measurement of the Personal Meaning System by accounting for its affective domain through the factoring in of Satisfaction with Education and life measures based on the SWLS. This was necessary because of the fact that the LAP–R (Reker 1994) was developed prior to Reker and Wong's (1988) publication of their model for the Personal Meaning System (Reker, personal communication) and, as such, the instrument only measures the cognitive and motivational components of the model. This study therefore sought to integrate all three components of the PMS model by combining the LAP–R and SWLS measures. Finally, it was intended that this study would spark further investigation of existential meaning and purpose within the field of educational research. The exciting possibilities for this line of inquiry are numerous and could lead to some important findings that could have enduring implications for educational practice and the development of effective learning environments in schools.

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