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Student perceptions of learning environment: disciplinary program versus general education classrooms

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ABSTRACT

The purpose of this study was to examine student perceptions of the learning environment in their program major and general education classrooms. The participants were 870 undergraduate students majoring in engineering, fine arts, education, economics and nursing programs at a university in Thailand. We found significant differences in the perceptions of the classroom learning environment across various disciplines. Engineering and economics students perceived the learning environment in general education classrooms as more cooperative than the learning environment in program major classrooms. Fine arts and nursing students perceived greater involvement among students in the program major classrooms than in the general education classrooms. Our findings contribute to the body of research on inter-disciplinary differences in classroom learning environments in universities and the ways in which these differences may impact student learning outcomes.

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Introduction

Experiences in the classroom have a significant influence on students' development, as having a positive classroom learning environment is considered both a worthy end itself and a means to valuable ends (Fraser, 2014). Studies have shown that students' perceptions of a classroom setting are associated with and a predictor of students' affective, cognitive and behavioral outcomes; for example, the relationship with the approaches to learning and self-concept (Dart et al., 1999), achievement motivational goal orientation (Koul, Roy, & Lerdpornkulrat, 2012), and achievement, attitude and self-esteem (Chionh & Fraser, 2009). In other words, students' perceptions of their academic environment have an effect on how they study, what they believe about themselves, what they are aiming for, what they are avoiding, what they like and dislike, and whether they will engage in learning or not. The literature suggests that the effective learning environment should encourage students to share and discuss ideas with peers, give students some control over their learning, promote connections between what students are learning and what they have experienced, and support cooperative tasks more than competitive tasks (Koul et al., 2012).

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For many decades, researchers and educators have studied how to build an effective, innovative classroom learning environment to engage students and motivate them to learn. However, students' perceptions of learning environments have been found to vary individually and differ considerably from what is intended by curriculum planners and teachers (Haarala-Muhonen, Ruohoniemi, Katajavuori, & Lindblom-Ylänne, 2011). A number of research studies have reported that students' perceptions of classroom learning environments widely vary with such determinants as grade level, school type, student gender, student competence, subject matter and discipline (e.g. Gherasim, Butnaru, & Mairean, 2013; Haarala-Muhonen et al., 2011; Khalil & Saar, 2009; Koul et al., 2012; Opolot-Okurut, 2010; Rita & Martin-Dunlop, 2011). This study placed importance on students' perceptions of the learning environment in different disciplines at the higher education level.

Learning environment at the higher education level

At the higher education level, first-year students in different subject areas begin a process of socialization to their academic environment (Becher, 1987), and see themselves as studying in markedly different environments (Ramsden, 1979). Every discipline has its own learning environment, which leads to disciplinary differences in traditions, habits and customs, values, culture, nature of knowledge, research patterns and outputs, teaching activities and curricula (Becher, 1987; Haarala-Muhonen et al., 2011). As learning environments influence students' cognitive, affective and behavioral outcomes, students in different discipline environments are assumed to feel, think and behave differently. Many prior studies have focused on the differences in students' perceptions of learning environment between contrasting disciplines, such as hard-pure (e.g. science) versus soft-pure (e.g. humanities) fields, or hard-applied (e.g. technologies) versus soft-applied (e.g. applied social science) fields (see Haarala-Muhonen et al., 2011; Hativa & Birenbaum, 2000; Vahala & Winston, 1994).

This study was designed to investigate the higher education learning environment in Thailand.

Thai educational system

Formal education in Thailand consists of six years of primary education (called Prathom 1–6), followed by three years of lower secondary education (called Matthayom 1, 2 and 3), three years of upper secondary education (called Matthayom 4, 5 and 6) and higher education. Administration and control of public and private universities are carried out by the Office of Higher Education Commission, a department of the Ministry of Education. There are 155 higher education institutes and about 1.68 million undergraduate students (males = 38.8%; females = 61.2%) (Thai office of the higher education commission, 2018a, 2018b).

The Thai higher education organizational system is based on a system of faculties under a separate dean, as in the United Kingdom. However, teaching and course organization are similar to the American system, with a credit course system. Bachelor's degree studies have a nominal duration of four years with a minimum of 120 credits.

General education in Thailand

General education courses are considered as interdisciplinary courses for undergraduate students to understand a common curriculum of the humanities and sciences. Students spend a lot of their study time on general education courses before graduation; for example, at Pennsylvania State University and University of Florida, one third of the students' total credits are from general education courses, while almost half of the total credits at the University of Washington also come from such courses. General education was introduced to the Thai curriculum in the hopes of providing students with a broader language and better understanding of the world and society. Presently, according to Thai curriculum standards for bachelor degrees, general education subjects are compulsory for all students at tertiary level. Students require at least 30 credits, which is about one quarter of the overall credits that undergraduate students have to register for. Students mostly take general education courses in the first and second years. Courses in general education are composed of humanities, social sciences, languages, science and mathematics (Thai curriculum standards of bachelor degree, 2015).

Thai educators have conveyed their concerns about general education as many questions are always raised by students and teachers: 'What is general education?'; 'Why do students have to study general education?'; and 'What are the purposes of general education?' From these questions, one concern which emerges is how to encourage students to engage in and perceive the importance of general education subjects as they do in their major subjects. This leads to the reconsideration of the learning environment in general education classrooms, which should properly serve the needs of students in different majors (Kosaiyawat, 1999; Nuansakul, 2013).

Purposes of the study

The determinants of the classroom learning environment have been varied in the literature and, noticeably, prior studies have mostly focused on the attributes of students and institutes. Even though some studies have investigated disciplinary learning environment differences, there is no study to date which explores how students perceive the learning environment in their major subjects differently from the learning environment in their general education subjects.

As educators have placed attention on the issue of how to engage students in general education and to make them perceive the importance of general education courses as much as courses in their major subjects, a further study on investigating students' perceptions of learning environments (by asking them to compare their major courses with general education courses) is needed. Finding out about students' perceptions and preferences with regard to their learning environment can serve instructors in selecting appropriate teaching strategies and in structuring learning environments to better serve students' needs in learning (Entwistle, 1990).

This study set out to examine the question, 'How do students in different majors perceive the classroom learning environment differently between general education subjects and major subjects?' Understanding more about such differences may provide teaching improvement specialists and researchers with valuable clues (Franklin & Theall, 1992). Comparison

Table 1. Descriptive statistics for students enrolled in five different disciplinary programs ($N = 870$).

Major	Males		Females		Total	
	Number	Percent	Number	Percent	Number	Percent
Engineering	178	63.3	103	36.7	281	32.3
Fine arts	85	32.1	180	67.9	265	30.5
Education	34	26.6	94	73.4	128	14.7
Economics	39	38.2	63	61.8	102	11.7
Nursing	5	5.3	89	94.7	94	10.8
	341	39.2	529	60.8	870	100.0

between general education and major disciplines contributes to further suggestions for improving educational practices in general education classrooms as well.

Methodology

Participants

The participants were first-year undergraduate students from five different academic programs (engineering, fine arts, education, economics and nursing) in a public university in Thailand: 92.3% of the responses to the survey were complete. The final sample for analysis consisted of 870 students (39.2% males, 60.8% females). All participants were taking the same general education subjects. Table 1 provides descriptive statistics for the research sample.

Procedures

Data collection was completed around the end of the first semester. A major concern with administration of classroom surveys is the possibility that respondents will feel coerced to participate and, as a result, will be less likely to answer questions honestly (Schutt, 2011). To address this concern, students were informed that their participation was voluntary, and that the results of the survey were confidential and would not affect their grade. Student completion of the survey took 15–20 min during one general education class period.

Instruments

The classroom learning environment survey used in this investigation was adapted from a prior study (Koul et al., 2012). When students think about their classroom environment, they do not think about it as a holistic environment, but as separate ones which depend on how they experience each classroom. Therefore, we then asked students to compare their experiences of the learning environment in general education courses with their academic major courses on five aspects:

- Cooperation (four items, for example, 'In which subject areas do you think that most students cooperate with each other?'): this aspect measured students' perceptions of working cooperatively as a team, and whether they feel that they can learn more when they work together.

- Competition (four items, for example, 'In which subject areas do you think that most students are expected to compete with one another?'): this aspect measured students' perceptions of teachers' expectations with regard to competing with each other, and whether they enjoy this.
- Involvement (six items, for example, 'In which subject areas do you think that you ask others for their ideas?): this aspect measured how students perceived involvement in learning by discussing their ideas with their classmates, trying to understand others' ideas, talking and listening carefully to others' ideas, and being encouraged by teachers to interact and share with each other.
- Autonomy (five items, for example, 'In which subject areas do you think that you decide with the teacher who to work with?'): this aspect measured whether students perceived that they have autonomy in making decisions related to academic tasks.
- Meaningfulness (five items, for example, 'In which subject areas do you think that what you learn is important to you?'): this aspect measured students' perceptions about learning meaningfully, which means whether they think what they learn is relevant to them, interests them, is important to them and will assist them in the future.

Students were asked to choose one answer from four choices: (1) general education subjects; (2) major subjects; (3) both of them; or (4) none of them.

Analysis

We adapted the perceived classroom learning environment scale from a previous study (Koul et al., 2012). In this study, we obtained coefficients of .74, .68, .84, .82, and .82 for perceived cooperation, competition, involvement, autonomy and meaningfulness, respectively. We compared students' perceptions of the classroom learning environment in their major subjects and general education subjects, as shown in Table 2.

Approximately half of the students in all five academic disciplines perceived the learning environment in both major subjects and general education subjects to be no different (students who chose 'both of them' or 'none of them': see the last two columns of Table 2), while about half of the students in each discipline perceived that experiences in general education classrooms were different from in their major classrooms. To investigate how students perceived learning environments differently between general education classrooms and major classrooms across disciplinary areas, we then focused more specifically on the first two choices provided for each aspect.

For example, with regard to the perceived cooperation we focused on: 'General education subjects are more cooperative' and 'Major subjects are more cooperative'. The number of first choices ('general education subjects') chosen and the number of second choices ('major subjects') chosen were then counted for all cooperation items. If, from the four items, a student chose the first one more than the second one, we coded it as 1, which means the student perceived general education subjects as more cooperative than major subjects. If a student chose the second one more than the first one, we coded it as 2, which means the student perceived general education subjects as less cooperative than their major subjects. If both were equal, it was coded as 0. We performed the same procedure with other perceived classroom learning environment aspects, as shown in Table 3. Then, we used chi-square analysis to determine whether there were significant differences across disciplinary areas in

Table 2. Comparative perceptions of five different aspects of learning environment in program major and general education classrooms ($N = 870$).

Which classroom had more of each of these five aspects of classroom learning environment?	In which classroom? (%)			
	GE	Major	Both of them	None of them
Cooperation				
'Most students work co-operatively as a team': GE or Major?	35.2	23.1	40.6	1.2
'Most students are expected to work with one another': GE or Major?	43.7	19.3	36.0	1.0
'Most students cooperate with each other': GE or Major?	34.5	22.2	42.2	1.2
'Most students are expected to work cooperatively with one other': GE or Major?	27.2	25.6	44.6	2.5
Average Cooperation: GE or Major?	35.2	22.6	40.9	1.5
Competition				
'Most students are expected to compete with one other': GE or Major?	14.4	56.1	20.3	9.2
'Most students compete with each other': GE or Major?	14.8	47.1	26.1	12.0
'The students enjoy the competition with one another': GE or Major?	16.2	27.7	29.0	27.1
'Teacher encourages competition between students': GE or Major?	14.1	26.3	31.4	28.2
Average Competition: GE or Major?	14.9	39.3	26.7	19.1
Involvement				
'Teacher encourages interaction and sharing between students': GE or Major?	32.2	22.6	42.9	2.3
'You talk to others about what you are learning': GE or Major?	16.9	29.2	51.7	2.2
'You ask others for their ideas': GE or Major?	19.9	25.3	53.1	1.7
'You listen carefully to other's ideas': GE or Major?	17.6	22.0	59.2	1.3
'You discussed your ideas with others': GE or Major?	20.7	22.4	53.7	3.2
'You try to understand other's ideas': GE or Major?	20.8	20.5	57.5	1.3
Average Involvement: GE or Major?	21.4	23.7	53.0	2.0
Autonomy				
'You decide with the teacher who to work with': GE or Major?	21.5	21.0	51.7	5.8
'You decide with the teacher when to learn': GE or Major?	18.2	26.0	48.3	7.6
'You decide with the teacher what to learn': GE or Major?	19.8	23.8	46.6	9.9
'You decide with the teacher how your work will be evaluated': GE or Major?	15.3	24.8	50.8	9.1
'You evaluate with the teacher what you learn': GE or Major?	20.7	24.9	47.1	7.2
Average Autonomy: GE or Major?	19.1	24.1	48.9	7.9
Meaningfulness				
'New learning is connected with what you have learned previously': GE or Major?	18.9	26.9	52.8	1.5
'What you learn has relevance for you': GE or Major?	16.4	33.8	48.5	1.3
'What you learn interests you': GE or Major?	11.2	39.1	48.5	1.3
'What you learn is important to you': GE or Major?	8.5	35.3	55.4	.8
'What you learn will assist you in the future': GE or Major?	7.1	32.9	59.4	.6
Average Meaningfulness: GE or Major?	12.4	33.6	52.9	1.1

the students' perceptions of classroom learning environments between two subject areas (general education versus major). Cramer's V values were reported as a measure of the effect size. According to Cohen's (1988) guidelines, Cramer's $V = .10$ corresponds to a small effect, .30 to a medium effect, and .50 to a large effect.

Results

Findings are reported for each aspect of the perceived classroom learning environment. First, responses (Table 2) to the questions about perceived cooperation, competition, student involvement, autonomy and meaningfulness are reported by overall percentage. Then, the

Table 3. Comparative perceptions of five different aspects of classroom learning environment among students enrolled in five different disciplinary programs ($N = 870$).

Which classroom had more of each of these five aspects of classroom learning environment?	Discipline				
	Engineering ($N = 281$)	Fine arts ($N = 265$)	Education ($N = 128$)	Economics ($N = 102$)	Nursing ($N = 94$)
Cooperation					
GE > Major	175 (62.3%)	70 (26.4%)	67 (52.3%)	72 (70.6%)	16 (17.0%)
GE > Major	50 (17.8%)	126 (47.5%)	20 (15.6%)	9 (8.8%)	50(53.2%)
GE = Major	56 (19.9%)	69 (26.0%)	41 (32.0%)	21 (20.6%)	28 (29.8%)
Competition					
GE > Major	25 (8.9%)	53 (20.0%)	44 (34.4%)	4 (3.9%)	24 (25.5%)
GE < Major	200 (71.2%)	128 (48.3%)	49 (38.3%)	84 (82.4%)	36 (53.7%)
GE = Major	56 (19.9%)	84 (31.7%)	35 (27.3%)	14 (13.7%)	34 (36.2%)
Involvement					
GE > Major	129 (45.9%)	47 (17.7%)	41 (32.0%)	46 (45.1%)	10 (10.6%)
GE < Major	72 (25.6%)	129 (48.7%)	44 (34.4%)	27 (26.5%)	44 (46.8%)
GE = Major	80 (28.5%)	89 (33.6%)	43 (33.6%)	29 (28.4%)	40 (42.6%)
Autonomy					
GE > Major	117 (41.6%)	35 (13.2%)	20 (15.6%)	33 (32.4%)	39 (41.5%)
GE < Major	69 (24.6%)	133 (50.2%)	62 (48.4%)	29 (28.4%)	24 (25.5%)
GE = Major	95 (33.8%)	97 (36.6%)	46 (35.9%)	40 (39.2%)	31 (33.0%)
Meaningfulness					
GE > Major	65 (23.1%)	26 (9.8%)	17 (13.3%)	20 (19.6%)	15 (16.0%)
GE < Major	113 (40.2%)	148 (55.8%)	71 (55.5%)	50 (49.0%)	48 (51.1%)
GE = Major	103 (36.7%)	91 (34.3%)	40 (31.3%)	32 (31.4%)	31 (33.0%)

Note:
Number in parentheses indicate column percentage.

results of chi-square test (Table 3) are reported to understand whether there were disciplinary differences with the results of effect size.

Perceived cooperation in the classroom

Of the students who completed the questions asking them in which subject area they perceived that learning in the classrooms was more cooperative, 40.9% responded that learning in both major and general education classrooms was cooperative, 35.2% perceived learning in general education classrooms as more cooperative than in their major classrooms, whereas 22.6% perceived the opposite.

When we investigated whether there were differences across disciplinary areas in the comparison of students' perceptions of cooperative learning in the two subject areas, we found that the difference was significant with a medium effect size, χ^2 (8, N = 870) = 161.11, $p < .001$, Cramer's $V = .30$. As can be seen in Table 3, the majority of economic, engineering and education students perceived general education subjects as more cooperative than their major subjects, with percentages of 70.6, 62.3 and 52.3%, respectively. Meanwhile, the results showed that only 26.4% of fine arts students and 17.0% of nursing students perceived general education subjects as more cooperative than their major subjects. In addition, about a half of the fine arts (47.5%) and nursing (53.2%) students in this study indicated that they perceived their major subjects as more cooperative than the general education subjects, whereas there was only a very small proportion of economics students (8.8%) who perceived the same. The results also showed there was a small percentage of engineering and education who perceived the same; 17.8 and 15.6%, respectively.

Perceived competition in the classroom

The descriptive statistics showed that many students (39.3%) indicated that most students were expected and encouraged by teachers to compete with one another in their major subjects more than in the general education subjects, while only 14.9% perceived that the general education subjects were more competitive. It was indicated by 26.7% of the respondents that both subject areas were equal with regard to competitiveness, while 19.1% perceived none of them as competitive.

For all five academic programs, the proportion of students who perceived learning in their majors as more competitive than learning in general education classes was more than those who did not. When we examined the disciplinary differences, a chi-square test showed us significant differences in students' perception of the classroom learning environment with regard to competition, with a small effect size, χ^2 (8, N = 870) = 104.26, $p < .001$, Cramer's $V = .25$. In particular, the proportions of economics and engineering students were twice that of education (82.4, 71.2 and 38.3%, respectively). Meanwhile, there were small proportions of economics and engineering students (3.9 and 8.9%, respectively) who indicated that general education subjects were more competitive. However, there was still about one-third (34.4%) of education students who perceived general education as more competitive than the subjects in their majors.

Perceived student involvement

Over half of all participants (53.0%) indicated that they learned by sharing and discussing their ideas with friends, and talking and listening to others' opinions, including being encouraged by the teacher to interact and share ideas. This was the same in both general education and major subjects. Meanwhile, the percentages of students who perceived that general education subjects were more involved and students who perceived contrarily were close; 21.4 and 23.7%, respectively.

Chi-square results showed significant disciplinary differences with a small effect size, χ^2 (8, N = 870) = 84.36, p < .001, Cramer's V = .22. Engineering, economics and education were again the top three groups of students who perceived that they get involved more in the general education subjects than in their major subjects, with percentages of 45.9, 45.1 and 32.0%, respectively. Engineering and economics also have very close proportions of students, 25.6 and 26.5%, respectively, who perceived that they got more involved in major subjects than in general education subjects. Fine arts and nursing students have a similar pattern of proportions; many students indicated that they got more involved in learning in their major subjects (48.7 and 46.8%, respectively), whereas a minority perceived that they got more involved in learning in general education classes (17.7 and 10.6%, respectively).

Perceived autonomy

When we asked students to compare their perception of whether they have more autonomy in making decisions related to academic tasks in general education subjects or in their major subjects, 48.9% of participants perceived that they have autonomy in both subject areas. It was indicated by 24.1% of participants that they have more autonomy in their major subjects, while 19.1% perceived more autonomy in general education subjects. Only 7.9% felt no autonomy in both subject areas.

We found significant differences across academic programs with a small effect size, χ^2 (8, N = 870) = 88.54, p < .001, Cramer's V = .23. Engineering, economics and nursing students perceived that they have more autonomy in general education subjects than in their major subjects (41.6, 32.4 and 41.5%, respectively), while fine arts and education students perceived more autonomy in their major subjects (50.2 and 48.4%, respectively). The latter percentages were about twice as high as those of engineering, economics and nursing students (24.6, 28.4 and 25.5%, respectively).

Perceived meaningfulness

Of the participants who responded to the question of whether general education subjects or major subjects were more meaningful, 52.9% indicated that both subject areas were meaningful to them. However, 33.6% of the participants felt that their major subjects were more meaningful and important for them than the general education subjects, whereas only 12.4% indicated more meaningfulness in general education subjects. There was just 1.1% of students who perceived that learning in both subject areas had no meaning for them.

When we examined whether there were differences across disciplinary areas, we found the differences were statistically significant with a small effect size, χ^2 (8, N = 870) = 25.29,

$p < .005$, Cramer's $V = .12$. It was found that 40.2% of engineering students, 55.8% of fine arts students, 55.5% of education students, 49.0% of economics students and 51.1% of nursing students perceived general education subjects as less meaningful, whereas 23.1% of engineering students, 9.8% of fine arts students, 13.3% of education students, 19.6% of economics students and 16.0% of nursing students perceived general education subjects as more meaningful.

Discussion

In accordance with self-determination theory, the design of curriculum and learning experience should center on three psychological needs: meaningfulness, autonomy and relatedness. Meaningful design of curriculum and instruction (e.g. through authentic, challenging and practical tasks and problems) provides relevant knowledge and skills necessary to acquire competence and success. Autonomy means that the curriculum provides opportunities for student-centered learning (e.g. opportunities for self-directed projects). Relatedness means that the curricular and instructional experiences support community-building and a sense of belonging (e.g. through team-based projects and other collaborative learning experiences). When the needs for meaningfulness, autonomy and relatedness are met, intrinsic motivation is enhanced and a student is more likely to feel that personal goals can be achieved (e.g. Deci & Ryan, 1985). When these needs are not met, students may experience environments as uncaring, coercive and unfair, and are more likely to become disengaged or disaffected (Fredricks & McColskey, 2012; Niemiec & Ryan, 2009).

In this investigation in Thailand, we found that the students perceived the learning environment in their major subjects to be more meaningful than the learning environment in their general education subjects. This general perception of meaningfulness makes sense; research has shown that college students perceive general education courses to be less relevant to career goals (e.g. Glynn, Aultman, & Owens, 2005). That being said, we found differences in perceptions of autonomy, involvement and cooperation as a function of student major: A significant majority of students enrolled in engineering and economics programs perceived more cooperation, involvement and autonomy in general education subjects than in their major subjects, whereas a significant majority of students enrolled in fine arts and nursing programs perceived less cooperation, involvement and autonomy in general education subjects than in their major subjects.

Interestingly, all the students were taking the same general education courses. Differences in perceptions as a function of student major may be rooted in the differences in curricular content or instructional practices (Erdle & Murray, 1986; Haarala-Muhonen et al., 2011; Hativa & Birenbaum, 2000). Erdle and Murray (1986) found the curricular content for arts and social sciences to be more related to student interests than curricular content for natural sciences. Hativa and Birenbaum (2000) found that instructors in education programs are more likely to actively guide, encourage and support students whereas engineering students were less likely to experience student-centered practices.

Past research has shown that engineering students develop more positive attitudes toward engineering when the classroom learning environment is student-centered and peer-interactive (Lin & Tsai, 2009). Students learn better and are more creative when they are intrinsically motivated, particularly on tasks that require conceptual understanding (Entwistle, McCune, & Hounsell, 2002; Kember & Kwan, 2000; Niemiec & Ryan, 2009; Prosser,

Ramsden, Trigwell, & Martin, 2003; Prosser & Trigwell, 2001). Tsai, Kunter, Lüdtke, Trautwein, and Ryan (2008) found that student interest for learning the content was enhanced for lessons in which teachers supported autonomy. Standage, Duda, and Ntoumanis (2006) found that teacher support for autonomy was associated with higher student self-regulation and intrinsic motivation, which in turn were associated with greater student effort and persistence.

In addition, degree of relatedness has an effect on curricular engagement (Lerdpornkulrat, Koul, & Poondej, 2018; Wang & Holcombe, 2010; Wentzel, 1997, 1998). Wang and Holcombe (2010) have shown that a sense of connectedness to teachers and peers is associated with multiple indicators of cognitive, affective and behavioral engagement. Lerdpornkulrat et al. (2018) found that relatedness is supported by a classroom climate that encourages peer interaction and the perception of such a climate to be positively associated with stronger intention to complete college studies.

We think that an important curricular consideration across all programs of study is the integration of learning tasks that support autonomy and a sense of relatedness, because such practices are more conducive to the development of intrinsic motivation and positive curricular engagement. Curricular design has an impact on the satisfaction of basic student needs by allowing intrinsic motivation to flourish and deepen the learning experience or by thwarting those processes (Niemiec & Ryan, 2009).

Limitations

Our study has a number of limitations. Firstly, prior research has shown that there can be gender differences in students' perceptions of the classroom learning environment (Dart et al., 1999; Koul et al., 2012), but our analysis of student perceptions did not take into account the influence of gender (e.g. in our sample, only 5.3% of students majoring in nursing were men and only 26.6% of education students were men). Secondly the survey design relies on self-reported data, a methodology that is descriptive, not explanatory (Wang & Holcombe, 2010). Our findings do not establish cause-and-effect relationships between academic program and student perceptions. Thirdly, we collected data from first year students who may not have enough experience to compare the learning environments in general education subjects and their major subjects. Future studies should consider the potential moderating effects of gender, undergraduate level, curricular content or instructional practices on student perceptions. Qualitative or mixed-method research would provide the opportunity for richer and more robust findings regarding student perceptions (Wang & Holcombe, 2010).

Conclusion

We conclude that our findings of inter-curricular differences in student perceptions of the learning environment represent factors that have been associated with outcomes such as negative student attitudes toward primary academic programs and general education courses (e.g. Nuansakul, 2013), issues and problems related to students changing their major (e.g. Sax, Kanny, Riggers-Piehl, Whang, & Paulson, 2015), and student withdrawal from university (e.g. Lerdpornkulrat et al., 2018; Mestan, 2016). The responsibility to achieve positive learning outcomes lies not only with students but with the curriculum designers, faculty and administrators, who must provide 'conditions, opportunities, and expectations' to

support positive outcomes (Coates, 2005, p. 26). When a significant number of students perceive less autonomy and relatedness in primary program classrooms compared to their general education classrooms, it indicates a lack of alignment in the curricular experiences of students. If the goal of the higher education is to promote understanding that makes links across and within subject areas, it is worthwhile to provide coherent education (e.g. Biggs, 2014; Fraser & Paraha, 2002), that is, well-aligned and cohesive curricula with corresponding instructional practices.

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