Social and Management Research Journal,
Vol 19, No 1 (2022), 107- 132
DOI: 10.24191/smrj.v19i1.17249

A Comparison of Learning Preference and Learning Challenges Between Science and Non-Science University Students

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Received: 10 November 2021
Accepted: 10 January 2022
Online First: 28 February 2022

ABSTRACT

Due to the need for rethinking the education system designed centuries ago, it is essential to understand the current challenges of the university learning environment. We aimed to compare the learning preferences and learning challenges between science and non-science university students. 109 individuals participated in the online survey. The dependent, collaborative and independent learning preferences were inspected. The internal and external factors of learning challenges were examined jointly with social support systems, motivation, and coping styles. Both groups displayed comparable learning preferences ($p>0.05$) except for social media. Eight out of 17 learning challenges were significantly different between science and non-science students ($p<0.05$). Both groups reported analogous support systems ($p>0.05$) except for housemates. Similar intrinsic and extrinsic motivations were unveiled ($p>0.01$). Dissimilar mature and neurotic coping styles were revealed ($p<0.05$). In conclusion, learning preferences between science and non-science students are relatively similar, but the learning challenges vary.

Keywords: learning environment, learning preference, learning challenges

INTRODUCTION

Although the main goals of universities remain relatively the same, the way students experience them has transformed considerably over the years (Rodrigues, Almeida, Figueiredo, & Lopes, 2019). The learning environment has attracted considerable attention from both scholarly and public's interest (Ndirangu & Udoto, 2011). The issue of a conducive learning environment for learners to engage and interact with learning new skills has received considerable attention, covering early childhood, primary, secondary and tertiary education, respectively (Hopkins & Reynolds, 2001). A good learning environment can be an immense attribute to the accomplishment of the learner. A conducive learning environment is not limited to physical environments alone but extends to the psychological, social or cultural factors that can influence learning capabilities.

The learning environment can either be a threat or sustenance to learn new knowledge or skills. A positive learning environment fosters a positive learning culture that leads to better and more promising learning outcomes. Stress is a common condition that has been reported to have a considerable impact on cognitive functioning (AlAteeq, Aljhani, & AlEesa, 2020; Ang & Huan, 2006; Behere, Yadav, & Behere, 2011; Lazarevic & Bentz, 2021; Reddy, Menon, & Thattil, 2018). There is evidence that motivation and coping mechanisms play a crucial role in optimising the learning environment (Deci *et al*., 1991; Ganesan *et al*., 2018). This integration of positive motivation and proper coping strategies in the learning environment can assist learners in stopping negative thinking from spiralling downward (Deci *et al.*, 1991; Ganesan *et al.*, 2018). Coping mechanisms are psychological strategies in protecting the individual from unacceptable thoughts or feelings (De Pasquale *et al*., 2020). They are generally divided into mature, neurotic, and immature mechanisms (Bowins, 2010; Carvalho, Reis, & Pianowski, 2019). Coping mechanisms used by the students have been reported to affect their academic performances (Negriy, 2016). The effects of social support on learning abilities have also been reported (Friedlander, Reid, Shupak, & Cribbie, 2007; Hinderlie & Kenny, 2002; Uleanya, 2020). In this study, the learning environment is examined from two perspectives –

the learning preferences and learning challenges. The learning preferences are deliberated by dividing imto lecturer-centred learning, collaborative learning with peers and independent learning using technology like Internet of Things. The learning challenges investigation covers the challenges of learning itself due to internal and external contributing factors; availability of support system; intrinsic and extrinsic motivational factors; and ability to make choices of mature and immature coping styles.

Thinking styles has been linked to emotional intelligence (Herbst & Maree, 2008; Moore, Snider, & Luchini, 2012). Brain hemisphericity influences the individual's learning style, intellectual and personality characteristics (Boyle, 1998; Shiflett, 1989). Brain hemisphericity has been suggested to vary with types of students (Saleh, 2001). Students majoring in education, nursing, communication, and law were found to be mainly right-brained, while students majoring in business/commerce, engineering, and science were found to be predominantly left-brained (Saleh, 2001). The left and right-brained tendency may indicate that preference of learning styles may be different between disciplines. Neuroscience studies have documented a theory of left-brained and right-brained dominance (Bryden, 1990; Herbst & Maree, 2008). The thinking process of the right brain is dissimilar to that of the left brain (Soyoof, Jokar, Razavizadegan, & Morovat, 2014). Left-brained learners are believed to have a digital brain that excels in science and mathematics due to its logical, analytical and systematic thinking process. Right-brained learners, meanwhile, are thought to have an analogue brain that stands out in arts and languages due to its creative and intuitive thinking mode. Hypothetically, a student enrolled in the science stream have a better analytical and logical thinking process to excel in science subjects than non-science students and vice versa in creative and intuitive thinking. In addition, right-brain learners have been reported to possess holistic emotional intelligence in comparison to left-brain learners. Right-brained thinking styles have been positively linked to both emotional intelligence management and emotional intelligence awareness. In contrast, left-brained thinking has been negatively related to both total awareness but was not associated with total management. So far, there has been limited information on the learning environment between science and non-science students. This research project aims to compare the learning preferences and learning challenges between science and non-science students in the same institution of higher learning.

METHODOLOGY

Ethical approval was obtained from the UiTM Research Ethics Committee [600-TNCPI (5/1/6) REC/03/2021 (UG/MR/216)]. The data collection of this cross-sectional survey was conducted through an online questionnaire using the Google Form platform in May 2021. The questionnaire was developed by combining the questions from HWRI survey form (Chen, 2020) and DSA-40 with modification (Vaillant, 1971). Learning preferences and learning challenges were the two main scopes of the survey (Table 1). Three types of learning preferences were studied, namely lecturer-centred learning (two items), collaborative learning with peers (three items) and independent learning using technology (three items). Under the learning challenges investigation, we examined the challenges in the learning environment with a total of 17 items. There were six items on the internal factor and 11 items on the external factor. The external factor was subdivided into the relationship (six items) and infrastructure issues (five items). We studied the alternative support platform from both internal (four items) and external (four items) perspectives. There were eight items in the motivation section (four for intrinsic and four for extrinsic motivation probe). We explored the coping styles with 40 items. The mature coping style encompassed anticipation, humour, sublimation, and suppression. The neurotic copy style contained idealisation, pseudo-altruism, reaction formation, and undoing. The immature coping style included acting out, autistic fantasy, devaluation, displacement, dissociation, isolation, denial/negation, passive aggression, projection, somatisation, rationalisation and splitting.

Table 1: Scopes of Learning Environment Investigation and Respective Descriptions

Two main scopes		Descriptions
Learning preferences	Learning preference (eight items)	Lecturer-centred learning (two items) • The lecturer who teaches the subject • The lecturer that you are most close with Collaborative learning with peers (three items) • Best friends at university • Classmates that you are close to • Classmates who are the best in that particular subject Independent learning using technology (three items) • Search for a solution myself using formal legit channel • Search for a solution myself through the internet or professional website • Search for a solution from social media such as Facebook, Instagram, Twitter etc
Learning challenges	Challenges of the university learning (17 items)	Internal factor (six items): • Lack of Interest in the course • Time constraint • Poor self-discipline • Personal health issue • Emotional turmoil • Stress External factor: • Relationship issue (six items): ○ Lack of family support ○ Unsupportive lecturer ○ Peer rivalry ○ Negative Gossiping ○ Dealing with difficult people ○ Housemate conflicts • Infrastructure issue (five items): ○ Financial problem ○ Lack of facility ○ Poor access to literature/ reference/reading materials ○ Learning overload ○ Poor quality of teaching environment

	An alternative support system to deal with challenges of university life (eight items)	Internal (four items): • Dean • Head of the program • Year coordinator • Academic advisor External (four items): • Housemates • Best friends not from university • Parents • Siblings
	Motivation (eight items)	Intrinsic motivation (four items): • Knowledge Quest • Self-satisfaction • Self-actualization • Sense of responsibility Extrinsic motivation (four items): • Peer Recognition • Peer pressure • Job security • Family factor
	Coping style (40 items)	If I can predict that I'm going to be sad ahead of time, I can cope better. (anticipation)
		When I have to face a difficult situation, I try to imagine what it will be like and plan ways to cope with it. (anticipation)
		I'm able to laugh at myself pretty easily. (humour)
		I'm usually able to see the funny side of an otherwise painful predicament. (humour)
		I'm able to keep a problem out of my mind until I have time to deal with it. (suppression)
		I can keep the lid on my feelings if letting them out would interfere with what I'm doing. (suppression)
		I work out my anxiety through doing something constructive and creative like painting, drawing etc. (sublimation)

		Sticking to the task at hand keeps me from feeling depressed or anxious. (sublimation)
		I get satisfaction from helping others, and if this were taken away from me I would get depressed. (pseudo-altruism)
		If I were in a crisis, I would seek out another person who had the same problem. (pseudo-altruism)
		I always feel that someone I know is like a guardian angel. (idealization)
		There is someone I know who can do anything and who is absolutely just and fair. (idealization)
		If someone mugged me and stole my money, I'd rather he be helped than punished. (reaction formation)
		I often find myself being very nice to people who by all rights I should be angry at. (reaction formation)
		After I fight for my rights, I tend to apologize for my assertiveness. (undoing)
		If I have an aggressive thought, I feel the need to do something to compensate for it. (undoing)
		People tend to mistreat me. (projection)
		I am sure I get a raw deal (unfair deal) from life. (projection)
		No matter how much I complain, I never get a satisfactory response. (passive aggression)
		If my boss bugged me, I might make a mistake in my work or work more slowly so as to get back at him. (passive aggression)
		I often act impulsively when something is bothering me. (acting out)
		I get openly aggressive when I feel hurt. (acting out)

		Often I find that I don't feel anything when the situation would seem to warrant strong emotions. (isolation)
		I get more satisfaction from my fantasies than from my real life. (autistic fantasy)
		I pride myself on my ability to cut people down to size. (devaluation)
		I'm a very inhibited person. (devaluation)
		I live more of my life in my dreams than in real life. (autistic fantasy)
		People say I tend to ignore unpleasant facts as if they didn't exist. (negation)
		I'm often told that I don't show my feelings. (isolation)
		I fear nothing. (negation)
		Doctors never really understand what is wrong with me. (displacement)
		When I'm depressed or anxious, eating makes me feel better. (displacement)
		I ignore danger as if I was Superman. (dissociation)
		I've special talents that allow me to go through life with no problems. (dissociation)
		Sometimes I think I'm an angel, and other times I think I'm a devil. (splitting)
		As far as I'm concerned, people are either good or bad. (splitting)
		I get physically ill when things aren't going well for me. (somatization)
		I get a headache when I have to do something I don't like. (somatization)
		I am able to find good reasons for everything I do. (rationalization)
		There are always good reasons when things don't work out for me. (rationalization)

The Cochran's Sample Size Formula with the confidence interval of 95% and margin of error of 5% was used to calculate the sample size. The inclusion criteria were local university undergraduate degree students, and the exclusion criteria were certificate, diploma and postgraduate students. The online questionnaire was sent out to 150 students from science disciplines and 150 students from non-science disciplines in the same public university.

Statistical Package for Social Sciences (SPSS) software version 23.0 (SPSS Inc. Chicago, IL, USA) was used for data entry and analysis. Significance levels were set at p-value <0.05. The 5-point Likert scale was selected to assess learning preference, challenges in university life, and motivation. The dichotomous approach was picked to investigate the coping styles. Mann Whitney U test was used to analyse the categorical data (ordinal) between two independent groups of science and non-science.

RESULTS

By the end of the survey period, data had been collected from 109 individuals, 59 of whom were science students (54.13%) and 50 non-science students (45.87%). The response rate was approximately 36.33%. Approximately 59.63% (65) were female, and 40.37% (44) were male. About 72.88% (43) were female, and 27.12% (16) were male in science, while the non-science students consisted of 44% (22) female and 56% (28) male.

In the learning preference investigation, respondents were asked to rate three pre-determined learning preferences: lecturer-centred learning, collaborative learning with peers, independent learning using technology. Five answer options were provided: never; only in a desperate situation; neutral feeling; one of the common choices; always my first choice. Collaborative learning with peers was consistently rated higher than more dispersed distribution in independent learning with technology. The lecturer who teaches the subject, best friends from the same university, classmates that are close or best in that subject were the common or first choice. The most surprising aspect of the data was in information searching preference. Platforms such as professional websites were preferred than formal legit channels within the university and social media such as Facebook,

Instagram, Twitter etc. The comparison results of the Mann Whitney U Test analysis are shown in Table 2. No significant difference was found between the two groups in lecturer-centred learning, and no significant difference between the two groups was evident in collaborative learning with peers. In terms of independent learning with technology, only social media platform is substantially different.

Table 2: The Comparison of Learning Preferences between Science and Non-Science Students

Personnel that learner will approach for academic or learning problem	**Mann Whitney U Test**	***p*-value**
Lecturer-centred learning		
The lecturer who teaches the subject	1317	0.32
The lecturer that you are most close with	1282	0.23
Collaborative learning with peers		
Best friends at university	1243	0.13
Classmates that you are close to	1408	0.66
Classmates who are the best in that particular subject	1386	0.56
Independent learning with technology		
Search for a solution myself using formal legit channel	1415	0.71
Search for a solution myself through the internet or professional website	1325	0.34
Search for a solution from social media such as Facebook, Instagram, Twitter etc	1111	0.02**

** Significance level at $p<0.05$

Both internal and external factors that affect the learning journey and university life were examined in this study. The internal factors covered the lack of interest in the course, time constraint, poor self-discipline, personal health issue, stress, and emotional turmoil. The external factors on relationship included lack of family support, unsupportive lecturer, peer rivalry, negative gossiping, dealing with difficult people, and housemate conflicts. The external factors on infrastructure comprised of financial problems, lack of facility, poor access to literature/reference/reading materials, poor quality of teaching environment, and learning overload. Five main challenges seem to affect university learning: lack of interest,

time constraints, stress, poor quality of learning environment, and learning overload. It is apparent from Table 3 that three internal factors (time constraint, poor self-discipline, stress), one external relationship factor (dealing with difficult people), and four external infrastructure factors (lack of facility, poor access to literature/reference/ reading materials, poor quality of teaching environment, learning overload) are significantly different between science and non-science students (p<0.05).

Table 3: The Comparison of Contributing Factors that Affect the University Learning Journey between Science and Non-Science Students

Factors	Mann Whitney U Test	*p*-value
Internal:		
Lack of interest in the course	1474	0.99
Time constraint	1163	0.04**
Poor self-discipline	938	<0.01*
Personal health issue	1326	0.35
Emotional turmoil	1190	0.07
Stress	1155	0.04**
External (relationship):		
Lack of family support	1427	0.77
Unsupportive lecturer	1402	0.64
Peer rivalry	1367	0.50
Negative Gossiping	1417	0.72
Dealing with difficult people	1092	0.02**
Housemate conflicts	1337	0.38
External (infrastructure):		
Financial problem	1427	0.77
Lack of facility	917	<0.01*
Poor access to literature/reference/ reading materials	1074	0.03**
Poor quality of teaching environment	1076	0.01**
Learning overload	1009	<0.01*

* Significance level at p<0.01
** Significance level at p<0.05

To understand the role of the alternative supporting system available for learners in dealing with academic or learning problems, respondents

were asked to rate the pre-determined eight potential personnel that they might approach. The five answer options were provided: never; only in a desperate situation; neutral feeling; one of the common choices; always my first choice. The single most striking observation from the data is that authoritative figures like the dean, head of the program, and year coordinator were hardly the first choice. The academic advisor has quite a balanced distribution of the five answer options. Best friends not from university, housemates, parents and siblings were more on neutral ground. The significant difference between the two groups was only found in the category of housemates (Table 4).

Table 4: The Comparison of the Choice of Personnel to Discuss Academic or Learning Problems between Science and Non-Science Students

Personnel that learner will approach for academic or learning problem	Mann Whitney U Test	*p*-value
Internal:		
Dean	1395	0.57
Head of the programme	1256	0.15
Year coordinator	1211	0.92
Academic advisor	1383	0.57
External:		
Best friends not from university	1379	0.55
Housemates	878	<0.01*
Parents	1402	0.64
Siblings	1272	0.19

* Significance level at $p<0.01$

All motivation factors are rated as above the midpoint Likert scale. The most interesting aspect of these findings is that science and non-science students rated 'not to disappoint family' as the most important factor. As Table 5 shows, there is no significant difference between science and non-science except for knowledge quest ($p< 0.05$).

Table 5: The Comparison of Intrinsic and Extrinsic Motivation between Science and Non-Science Students

Motivation	Mann Whitney U Test	*p*-value
Intrinsic		
Knowledge quest	1105	0.02**
Self-satisfaction	1186	0.064
Self-actualization	1471	0.98
Sense of responsibility	1424	0.74
Extrinsic:		
Peer recognition	1389	0.59
Peer pressure	1444	0.85
Job Security	1204	0.08
Not to disappoint family	1409	0.66

** Significance level at $p<0.05$

Interestingly, more than 50% of the students picked 'yes' as answers for each category of the mature coping types. The results for neurotic coping styles were mixed. Only pseudo-altruism and undoing categories of neurotic coping styles received more than 50% of 'yes'. However, positive responses for both idealization and reaction formation were not far below 50%. Less than 50% of the students opted for the immature coping styles in each cluster except for rationalisation. Only eight coping styles were significantly different between science and non-science students (Table 6). Two from mature coping styles: anticipation and suppression, and two from neurotic ones: idealisation and undoing. Four from immature coping techniques: passive aggression, isolation, splitting and somatization. Further analysis revealed that there was a significant difference in preference percentages between science and non-science students in mature coping style (Mann Whitney U Test = 1139, $p<0.05$) and neurotic coping style (Mann Whitney U Test = 894, $p<0.01$), but not in immature coping style (Mann Whitney U Test = 1164, $p=0.058$).

Table 6: The Comparison of Coping Styles between Science and Non-Science Students

Coping Styles	Mann Whitney U Test	*p*-value
Immature		
Projection	1247	0.140
Passive-aggressive	1092	0.012**
Acting out	1254	0.138
Isolation	1146	0.032**
Devaluation	1387	0.551
Autistic fantasy	1427	0.753
Denial/Negation	1335	0.337
Displacement	1342	0.358
Dissociation	1422	0.706
Splitting	1115	0.013**
Somatization	1175	0.048**
Rationalization	1441	0.809
Neurotic		
Pseudo-altruism	1250	0.133
Idealization	1126	0.022**
Reaction formation	1396	0.601
Undoing	809	<0.01*
Mature		
Suppression	1167	0.040**
Sublimation	1467	0.958
Humour	1376	0.521
Anticipation	1121	0.018**

* Significance level at $p<0.01$
** Significance level at $p<0.05$

DISCUSSION

Very little was found in the literature on the question of learning preferences. Generally, the lecturer was regarded as the first teacher, peers as the second teacher and the internet as the third teacher in the learning ecosystem. Lecturer-centred learning was the traditional approach where

the lecturer's function was merely presenting information to the students who are expected to receive the knowledge being presented passively. Collaborative learning refers to various educational approaches involving a joint intellectual effort by students (Han, Kim, Rhee, & Cho, 2021; Michael Nussbaum, 2008; Noroozi, Weinberger, Biemans, Mulder, & Chizari, 2012). Collaborative learning activities can be very diverse but mostly pinned on students' exploration or application of the course material and not just the lecture notes. Although collaborative learning plays a vital role in gaining knowledge and enhancing competencies, students may face difficulties participating in a group discussion. Students may find it difficult to view a problem from others' perspectives, support their opinions with evidence or make counterarguments. There were many ways in which technology can support greater independent learning for learners (Kovalyova & Loksha, 2020; Naveed, Alam, & Tairan, 2020; Sykes, Postma, Uys, Brandt, & Crafford, 2020; Torres-Díaz, Duart, Gómez-Alvarado, Marín-Gutiérrez, & Segarra-Faggioni, 2016). Internet usage is increasing rapidly, especially for three-tier learning from primary to secondary and tertiary education. Our findings revealed that both lecturer-centred learning and collaborative learning with peers are relatively rated higher. More dispersed distribution was found in independent learning with technology. There is a lot of potentials to tap into the information available on the internet. The internet can be valuable for students to foster self-learning, widen the scope of reading and learning, perform information search ahead of scheduled lecture slot, explore additional information to complete multiple assignments, and encourage peer learning.

Stress is increasingly recognised as a severe concern in students' academic life (AlAteeq *et al.*, 2020; Ang & Huan, 2006; Behere *et al*., 2011; Lazarevic & Bentz, 2021; Reddy *et al.*, 2018). Various internal and external factors can trigger feelings of stress. The present study consistently rated five main challenges (learning overload, time constraints, stress, lack of interest, poor quality of learning environment) to affect university learning. Experiencing difficulty managing the academic workload at university was not uncommon (Bitzer & Bruin, 2004). Learning overload was negatively related to adjustment to university life. Learning overload and time constraints reflect the students' mindsets of being overwhelmed by the academic requirements while pursuing a degree at university (Kamel, 2018). Students' perceptions of their ability to cope with academic requests

can affect their interest and effort (Petersen, Louw, & Dumont, 2009). Low interest and effort were linked to academic performance and adjustment to university life (Chambel & Curral, 2005). Overloading students causes academic stress and affects mental and physical health that can hinder learning. Science and non-science students in the present study exhibited variation from many aspects of challenges in university life. Science students encountered more infrastructure challenges such as lack of facility, poor access to information, poor quality of teaching environment, and learning overload. Science students also reported more stress, time constraint, poor self-discipline, and dealing with difficult people.

Several studies have documented that social support was related to and predictive of adjustment to university life (Friedlander *et al*., 2007; Hertel, 2002; Hinderlie & Kenny, 2002; Lidy & Kahn, 2006). Social support can come from multiple sources such as parents, lecturers, friends, coursemates, and university to improve students' adjustment to university life and to cope with academic stress (Demaray, Malecki, Davidson, Hodgson, & Rebus, 2005; Elias, Noordin, & Hj Mahyuddin, 2010). Most students in our study seemed to shun away obtaining help from authoritative internal figures and preferred to seek for external support system instead. This is something that educators need to work on to improve communication, and further research to understand the gaps of communication is thus required.

Academic performance and adjustment to university have been linked to psychosocial variables such as motivation and help-seeking (Petersen *et al*., 2009). There are extrinsic and intrinsic forms of motivation (Deci *et al*., 1991). Intrinsic motivation is the act of doing an activity purely for the joy of doing it that can foster solid and flexible critical thinking skills (Ryan & Deci, 2000b, 2000a; Vansteenkiste, Lens, & Deci, 2006). Extrinsic motivation employs external rewards or punishments to encourage work completion to maintain academic persistence but low interest (Ryan & Deci, 2000b, 2000a; Vansteenkiste *et al*., 2006). Motivation fosters creativity and critical thinking as well as cultivating resilience and self-assurance. A lack of intrinsic and extrinsic motivation can be an obstacle to learning (Ryan & Deci, 2000b, 2000a; Vansteenkiste *et al.*, 2006). Therefore, motivation impacts how likely a student would either give up or move forward. Our subjects seem to have both forms of motivation to navigate their studies. What proved to be stressful was the expectations from parents (Reddy *et*

al., 2018). Science and non-science students rated 'not to disappoint family' as the most important driving factor to study. Other factors were rated as lesser roles but were still important. Our findings suggested that university students were relatively resilient and would not easily give up when facing challenges in their studies.

Coping styles have been associated with the general well-being and quality of university life (Hyphantis *et al*., 2013; Miranda & Louzã, 2015; Salimynezhad, Poor, & Nasiri, 2015). Students use different coping mechanisms to overcome their stress (Walburg & Chiaramello, 2015). The 40 items used in the coping style investigation were modified from the Defence Style Questionnaire (DSQ-40) with minor language and cultural adjustments to fit into the local culture (Andrews, Pollock, & Stewart, 1989; La Cour, 2002). The mature coping style encompassed anticipation, humour, sublimation, and suppression. The neurotic copy style contained idealisation, pseudo-altruism, reaction formation, and undoing. The immature coping style included acting out, autistic fantasy, devaluation, displacement, dissociation, isolation, denial/negation, passive aggression, projection, somatization, rationalisation and splitting. Stress is unavoidable in university students' life (Ganesan *et al.*, 2018). Coping styles have a substantial impact on psychological distress (Ciocca *et al*., 2020). Coping styles can predict psychological complications (Nezhad, Khodapanahi, Yekta, Mahmoodikahriz, & Ostadghafour, 2011). Immature defence mechanism has been linked to behavioural and personality problems (Carvalho *et al.*, 2013; Carvalho *et al*., 2019; Ciocca *et al.*, 2020; Pour *et al.*, 2011). In the present study, the coping styles used are significantly different between science and non-science students in mature and neurotic coping techniques, but not in immature coping styles. Only eight coping styles were found to be quite different between science and non-science students: anticipation and suppression (mature); idealisation and undoing (neurotic); passive aggression, isolation, splitting and somatisation (immature). Anticipation is about realistic planning for future discomfort (Walburg & Chiaramello, 2015). The anticipation of a potentially stressful event is one way a person may mentally prepare for it. Suppression is the conscious decision to delay paying attention to anxiety-provoking thoughts, memories, emotions to cope with the present reality, making it possible to access uncomfortable or distressing feelings later whilst accepting them (Walburg & Chiaramello, 2015). Idealisation is a psychological or mental process of attributing overly

optimistic qualities to another person or thing (Walburg & Chiaramello, 2015). It is a way of coping with anxiety in which an object or person of ambivalence is viewed as perfect or as having exaggerated positive qualities. Undoing is a defence mechanism in which a person tries to cancel out or remove an unhealthy, destructive or otherwise threatening thought or action by engaging in contrary behaviours (Walburg & Chiaramello, 2015). Passive aggression is a coping mechanism used when people are afraid of displaying anger or feel powerless (Walburg & Chiaramello, 2015). Passive-aggressive behaviour can manifest as resentment and opposition to the demands of others; procrastination and intentional mistakes in response to others' requests; cynical, sullen or hostile attitude; frequent complaints about feeling underappreciated or cheated. Even though peer and lecturer-student relationships are necessary for students' well-being, they can trigger negative feelings and thoughts. A student may feel emotionally isolated despite having an extensive social network. Emotional isolation can act as a defence mechanism to protect a person from distress (Walburg & Chiaramello, 2015). Splitting is a psychological mechanism to tolerate difficult and overwhelming emotions by seeing someone as either good or bad, idealised or devalued (Walburg & Chiaramello, 2015). This makes it easier to manage the emotions that they are feeling. Somatisation involved unconscious rechannelling of repressed emotions into somatic symptoms to transforming uncomfortable feelings towards others into uncomfortable feelings toward oneself: pain, illness, and anxiety (Walburg & Chiaramello, 2015). Nevertheless, a more comprehensive quantitative analysis of the coping styles is required in future research.

The learning preferences and learning challenges can be closely linked in the learning environment of a tertiary education institute. Those prefer lecturer-centred learning adopt dependent learning mode. Proactive learners usually prefer to learn collaboratively with peers; or independently using technology. Proactive learners may encounter less internal challenges, more intrinsic motivational factors and more mature coping styles. The availability of support system is crucial in helping learners to face challenges. Taken together, these results provide insights into the learners and the learning environment. This basic information can move a step forward in developing a more conducive learning environment for a better strategic plan in shaping the future direction of education.

CONCLUSION

The learning environment plays an essential role in learning. This study compared the learning preferences and learning challenges between science and non-science university students. Both science and non-science students seem to have a balanced distribution of the three learning preferences in dealing with academic challenges: lecturer-centred learning, collaborative learning with peers, independent learning using technology. Science and non-science students in the present study exhibited more variation in university life challenges. Both groups reported analogous support systems, and both intrinsic and extrinsic motivations were highly rated. The coping styles differ significantly between science and non-science students in mature and neurotic collections, but not in the immature set.

ACKNOWLEDGEMENT

Research supported by Research Entity Initiative [600-IRMI/REI 5/3 (016/2018)]. We would like to thank Dr Miranda Benedito and Prof Mario Louza for guidance in the DSQ classification.

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