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Multiple Intelligences, Motivations and Learning Experience Regarding Video-Assisted Subjects in a Rural University

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This study investigates multiple intelligences in relation to online video experiences, age, gender, and mode of learning from a rural Australian university. The inter-relationships between learners' different intelligences and their motivations and learning experience with the supplementary online videos utilised in their subjects are investigated. These videos were accessed by students using a variety of digital devices, including mobile devices and in lecture theatres. Quantitative responses using online surveys were collected from 111 students. Measures included McKenzie's Multiple Intelligences Inventory and the Online Video Experience Inventory. The Online Video Experience Inventory resulted in two sub-scales, namely, motivation and learning experience. Overall multiple intelligences was significantly positively correlated with learning experience but not student motivation. Although the findings revealed a significant difference between the MI profiles of respondents and their age category, it was revealed that all students are lower in Existential intelligence. Further analyses between gender and the MI subscales also indicated significant differences between gender and Logical-Mathematical and Intrapersonal intelligences. However, a negligible significant relationship was found between the two sub-scales of the Learning Experience Inventory and age of the participants.

Keywords: multiple intelligences, students' motivation, students' experience, rural university, video-assisted learning

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INTRODUCTION

Digital technologies, connected to the Internet and internal university networks as an aspect to increase the quality and reach of teaching and learning in higher education, have already changed the lives of learners around the world. Recent reforms in Australian tertiary education are a good case in point. Providing the students with the opportunity of complementing internal classes with online supplements has been one of the crucial developments. Traditionally, courses were offered in internal or face-to-face mode. Today, however, owing to the growth of technology and demand for alternative modes of delivery, some courses are offered fully or partially online. This use of the Internet follows the aim of government to improve the accessibility of tertiary education for all Australians. Also this mode of the Internet learning and teaching would be beneficial to those students who otherwise could not participate internally. Modes of delivery such as online or blended may never entirely replace direct face-to-face involvement, but they have the potential to augment traditional instruction. This has motivated researchers to direct their attention to the use of Information Communication Technology (ICT) to help learners become confident and active communicators. In addition, some researchers (Driscoll, Jicha, Hunt, Tichavsky, & Thompson, 2012; Keengwe, Onchwari, & Agamba, 2014) state that online learning may provide an effective learning environment if designed by using pedagogically sound practices. Accordingly, universities have utilized a number of online affordances to support learning and teaching.

One way to enhance teaching and learning via technology is using educational video clips across different modes and subjects. For instance, Sherer and Shea (2011) state that the use of online videos in higher education is increasing as part of the explosion of Web 2.0 tools that are now available. Thinking about how educational video clips can enhance learning gives academics the opportunity to adjust and update their traditional curriculum and teaching approaches to meet the needs of diverse learners in higher education. For instance, McCoog (2007), Henry et al. (2005), and the Bill and Melinda Gates Foundation (2010) highlight the importance of thoughtful and purposeful use of technology to facilitate students' achievements. They state that it should help exploration of other learning avenues in the process of differentiating instruction with clear educational goals. It should also engage students in creative information gap activities and real experiential learning.

The multi-generational students are "demanding a change in the classroom because of their ability to gather information faster than any other generation" (Sheskey, 2010, p. 197; Willingham, 2010, p. 1). With the increased use and mobility of computers and other digital devices comes the increased need to equip learners to engage with the online challenges in different learning modes. In providing an optimal learning environment for learners, we need to understand students' experiences and perceptions, as well as how to best use technology affordances to enhance face-to-face and blended classes. In this regard, the relative efficacy of online and face-to-face courses is still under question and needs to be revisited. The first step in understanding how the students' needs could be met is to determine their preferences and individual learning

needs. Whether students fully employ online components of courses and individual tools, and whether they perceive these affordances as adding value to their educational experience and understanding is still relatively unknown.

Theory of Multiple Intelligences

The theory of multiple intelligences which was developed by Howard Gardner in 1983, refers to a learner-based philosophy that exceeds the traditional view of intelligence as being focused on verbal-linguistic and logical-mathematical intelligences into a multifaceted human intelligence. Accordingly, Gardner posits that everyone has at least varying degrees of nine different intelligences including verbal-linguistic, logical-mathematical, visual-spatial, bodily-kinesthetic, musical-rhythmic, interpersonal, and intrapersonal, naturalist, and existential intelligences. A brief description of the intelligences is provided below.

Verbal-Linguistic: This intelligence is defined by Richards and Rodgers (2014) as using language in an innovative and special way. Adding to this definition, Armstrong believes that Verbal-linguistic intelligence involves the ability to use the syntax, semantics, phonology, and pragmatic dimensions of language or its practical use (e.g., rhetoric, explanation, mnemonics, and metalanguage).

Logical-Mathematical: Logical-mathematical intelligence is typically characterized as the capacity 'to use numbers effectively' and 'to reason well' (Armstrong, 2009, p. 6) or the capacity to think logically (Richards & Rodgers, 2014).

Visual-Spatial: Visual-spatial intelligence encompasses the abilities to see the visual-spatial world accurately and to perform transformations upon those perceptions. As such, Armstrong (2009) defines this intelligence as "sensitivity to color, line, shape, form, space, and the relationships that exist between these elements…[that] includes the capacity to visualize, to graphically represent visual or spatial ideas, and to orient oneself appropriately in a spatial matrix" (p. 7).

Musical-Rhythmic: Armstrong (2003) defines this intelligence as "the ability to understand and express components of music, including melodic and rhythmic patterns, through figural or intuitive means (the natural musician) or through formal analytic means (the professional musician)" (p. 13).

Bodily-Kinesthetic: This intelligence encompasses the capacity to use mental abilities to coordinate body movements, revealing the related cooperation between mental and physical activities. Accordingly, Green and Tanner (2005) state that these people "enjoy physical manipulation tasks, such as dancing or acting something out" (p. 313).

Interpersonal: Sensitivity toward others and the world around them is an apparent feature of individuals having a highly developed interpersonal intelligence. Simply put, they understand other people and love working with them. Gardner (2011) defines this intelligence as "the ability to notice and make distinctions among other individuals and in particular, among their moods, temperaments, motivations, and intentions" (p. 253).

Intrapersonal: The core ability of this inner-self intelligence resides in individuals' understanding and awareness of their own feelings and thoughts. Gardner (2006a) defines this intelligence as the capacity "to form an accurate, veridical model of oneself and to be able to use that model to operate effectively in life" (pp. 49-50).

Naturalist: This intelligence which was added to the list in 1995, encompasses individuals who are sensitive to patterns, make connections to elements in nature and enjoy and respect other species and the environment. According to Armstrong (2009), they are sensitive to other natural phenomena such as mountains, cloud formations and so on.

Existential: The ninth intelligence was added to the list in 1999 and is called the intelligence of big questions. This intelligence speaks about the abilities to raise and ponder big questions (Gardner, 2006a). Accordingly, Palmberg (cited in Richards & Rodgers, 2014) states that this intelligence is "a concern with philosophical issues such as the status of mankind in relation to universal existence.

Accordingly, multiple intelligences (MI) may be an important influence on students' success in online supplementary learning (Lopez & Patron, 2012; Tyler & Loventhal, 2011). Identifying the weaknesses and strengths of students can potentially make them more independent (Coffield, Moseley, Hall, & Ecclestone, 2004; Diaz-Lefebvre, 2004; Lopez & Patron, 2012) especially in the online environment where the interaction between student-teacher is limited and requires learners to rely on more independent self-teaching techniques than previous student cohorts. According to Foong, Shariffudin, and Mislan (2012), the way of delivering the knowledge may not match the abilities of learners, leading to inefficient outcomes and learning failure of learners. Therefore, Foong et al. claim that to enhance learning and to overcome learning difficulties, learners should know their potential, strengths and weaknesses. To achieve effective learning in online settings, Felix (2005) posits that instructors need to consider both the cognitive process and the socio-constructivist process. Students who are aware of their own strengths and weaknesses "can adjust their own cognition and thinking to be more adaptive to diverse tasks" (Amer, Barwani, & Ibrahim, 2010, p. 103) and, therefore, they can facilitate their learning.

In addition, research on multiple intelligences (MI) has revealed certain similarities and differences. In acknowledging the discrepancies among studies, certain differences have been documented and identified between these studies. A review of some recent studies on MI in different countries and disciplines has revealed that perhaps McKethan, Rabinowitz and Kemodle (2010) and Lopez and Patron (2012) were among the first researchers who investigated the MI of students in different modes of delivery. For example, Lopez and Patron (2012) conducted a quantitative study to explore different intelligences that students use in their Business Statistics courses. The study aimed to collect data through a survey from 128 males and females. The data were collected from four classes, including two face-to-face, one online and one blended learning mode of delivery. Descriptive statistics of the findings revealed that students were higher in interpersonal intelligence and lower in verbal-linguistic and visual-spatial intelligences. Musical-rhythmic and logical-mathematical intelligences were other dominant

intelligences of students. Further analysis on intelligence types and gender revealed no significant difference between male and female participants as they were high in interpersonal intelligence and low in visual-spatial intelligence. In addition, the *t* test and Wilcoxon tests showed that face-to-face students, compared to their counterparts in blended and online classrooms, are weaker in intrapersonal and interpersonal intelligences. However, no significant difference was found between these two intelligences in blended and online classrooms. Online students were found to be higher in logical-mathematical intelligence compared to the students in blended and face-to-face modes of learning. As such, Lopez and Patron suggest instructors use more interpersonal techniques such as online discussion groups and wikis in their online teaching.

In a similar vein, Meneviş and Özad (2014) carried out a quantitative study to investigate the influence of age and gender on MI. The participants were 517 high school students of both genders in grades 10 to 12 and aged 15 to 17 years old. Based on the results, a significant difference was found between verbal-linguistic, bodily-kinesthetic, existential, musical-rhythmic, interpersonal, intrapersonal and naturalist intelligences of students and their gender. Similarly, a significant difference was found between the age and visual-spatial, logical-mathematical, intrapersonal, naturalist and existential intelligences. As reflected in the aforementioned studies, these findings were all carried out in other countries and were collected from students in different settings and disciplines. As a consequence of these attempts, each researcher has come up with a different finding. Perhaps it is worth considering whether for higher degree students there are age and gender differences for each of the multiple intelligences.

Individual needs and individual differences are other important areas which should be catered for in different learning modes and settings. The way learners learn is related to their needs and the prevailing conditions in their learning environment. For instance, often online learners feel that they are left out of course activities and their individual needs are not considered (Tyler & Loventhal, 2011). To counter this, Gardner's MI theory could be a useful alternative as it has the capability to address some of these demands and to offer opportunities to meet individual needs. MI is not the only pedagogical approach to address issues of student individuality, but it takes different ways of learning into account. According to Tyler and Loventhal (2011), pedagogy and instruction through an MI perspective offers many advantages to increase the learning of students. For instance, they claim that offering some courses online requires a variety of MI to be utilized. Accordingly, the study seeks to:

- Outline the descriptives regarding the MI profiles of the whole student volunteer sample and then split the profiles by age
- Determine whether there are gender and age differences for each of the multiple intelligences
- Determine the construct validity of the Online Video Experience Inventory (OVEI)
- Determine the inter-relationships between age, MI subscales and the OVEI subscales

- Determine whether there are gender, age and modes of delivery differences for each of the OVEI subscales.

METHOD

Participants

The participants for this quantitative study were 32 males (28.8%) and 79 females (71.2%), giving a total of 111 tertiary respondents studying at a regional and rural university in Australia. They were taking undergraduate subjects in Behavioural Sciences. As the age of students was from 17 to 58, it was decided to categorize the age of respondents on the basis of the developmental eras introduced in Levinson's theory (Peterson, 2014, p. 478). According to the theory guidelines, developmental eras are divided into four categories named: pre-adulthood (aged 0-23), early-adulthood (aged 24-45), middle –adulthood (aged 45-65), and late-adulthood (aged 66 and above). For this study, three out of the 4 categories were used. The respondents were 74 pre-adulthood (66.7%), 33 early-adulthood (29.7%) and 4 middle-adulthood (3.6%). The respondents were from different years of study as 91 of them were in the first year, 13 in second year, 6 in third year and 1 respondent was in the final year. They were enrolled as part time and full time (12 part time, 99 full time) in Behavioural Sciences subjects. Majority of respondents, 109 (98.2%), were studying 'face-to-face, on campus' and only 2 (1.8%) of them were studying in 'Distance with some face-to-face on campus component' mode of delivery. For the majority of students (n=81, 73.0%) their current enrolment was their first tertiary study. It was also revealed that 27.0% (30 out of 111) of the student respondents have previously obtained another tertiary degree.

Instruments

The instruments utilized for this study were McKenzie's Multiple Intelligences Inventory and an Online Video Experience Inventory (OVEI).

Multiple Intelligences Inventory

To identify the intelligence profile of the participants, McKenzie's Multiple Intelligences (MI) Inventory was used. The scale consists of 90 statements related to each of the nine intelligences proposed by Gardner (1999a, 1999b). Each student is required to complete the likert-type inventory by placing a number from 1 to 5 (corresponding to 'completely disagree' to 'completely agree') next to each statement they feel accurately describes them. In the first part of the inventory**,** the researchers attempted to elicit the participants' demographic information in relation to their gender, age, student status (part time or full time), and academic level. The overall reliability coefficient of the MI inventory was found to be $\alpha = 0.91$.

Online Video Experience Inventory (OVEI)

The inventory includes two sections. In the first part, the researchers aimed to identify participants' level of agreement with statements related to the use of videos in different modes of instruction. This section of the questionnaire contained 19 items using a likert scale where 1 corresponded to 'completely disagree' and 5 to 'completely agree'. In

fact, the questions were guided by a large pool of items derived from the literature on online videos and different questionnaires. By combining the related questions, the most relevant ones were selected and adopted for the study. The wording was improved to avoid ambiguity, thus ensuring clarity in each question and excluding any probable question overlap. Two lecturers familiar with the study reviewed and focused on the appropriateness of the questionnaire, thus determining the face validity of the items. After having made the required modifications, it was appropriate to proceed with the survey. The *Cronbach alpha of the Online Video Experience Inventory (OVEI) was found to be* large ($\alpha = 0.88$).

Data Collection Procedure

Before starting data collection, ethical clearance was sought and granted. Following the required standard ethical codes, contacts were made with the academics teaching the subjects and the subject coordinators to seek their permission to conduct a survey with a sample of students enrolled in their subjects. Permission to speak to the students in the respective classes was sought after ethics approval was granted and before data collection. This was to invite them to take part in the research project and to answer any questions they may have about their possible participation. They were also informed that participation in the study was voluntary and they were under no obligation to accept the invitation. Immediately after each session, lecturers were provided with the online survey web links hosted on SurveyMonkey® for distribution to their students.

As an incentive for participation, 4 gift cards were made available. Research has shown that a token incentive effectively increases the response rate (Helgeson, Voss, & Terpening, 2002; Jobber, Saunders, & Mitchell, 2004; Marsden & Wright, 2010; Newby, Watson, & Woodliff, 2003).

Data Analysis

Descriptive and inferential statistics were used to address the quantitative questions. The MI inventory analysis was made according to its instructions. Based on the result of the normality test revealing violations of the distribution assumptions of parametric tests, alternative nonparametric techniques i.e., Mann-Whitney U tests and Chi-square analysis were utilized to compare mean ranks for two group categorical frequencies. Further, the OVEI was subjected to Principal Component Analysis (PCA).

FINDINGS

The findings presented below are based on the data analysed quantitatively and are structurally partitioned into two phases. The findings regarding the MI inventory are presented first. This is followed by the factor analysis and the associated analyses.

In assessing respondents' MI profiles, it was revealed that students are higher on Intrapersonal intelligence (M=39.59) and lower in Existential intelligence (M=30.91) (see Table 1). Bodily-Kinesthetic (M=38.51) and Musical-Rhythmic (M=36.29) intelligences were other highly developed intelligences of students.

Table 1
Descriptive Statistics of the MI profiles of Students (*N*=111)

Intelligences	Minimum	Maximum	Mean	S.D.
Intrapersonal	25.00	50.00	39.59	4.43
Bodily-Kinesthetic	25.00	47.00	38.51	3.75
Musical-Rhythmic	26.00	45.00	36.29	3.79
Verbal-Linguistic	26.00	48.00	36.24	4.26
Naturalist	22.00	45.00	35.46	4.09
Interpersonal	25.00	45.00	35.39	3.56
Logical-Mathematical	16.00	45.00	34.71	3.99
Visual	22.00	45.00	33.85	4.21
Existential	21.00	42.00	30.91	3.95

To find out the MI profiles of respondents based on the age category, the raw scores were subjected to descriptive analysis and the results are shown in Table 2. As indicated in Table 2, the students in pre-adulthood category (***N***=74) are higher on Intrapersonal intelligence (*M*=39.72) and lower in Existential intelligence (*M*=30.86). Early-adulthood respondents (***N***=33) are higher on Bodily-Kinesthetic intelligence (*M*=39.64) and lower in Existential intelligence (*M*=30.91). The middle-adulthood respondents (***N***=4), are higher on Intrapersonal intelligence (*M*=40.50) and lower in Existential intelligence (*M*=31.75).

Table 2
Descriptive Statistics of the MI subscales based on the Age Category

Intelligence	Minimum	Maximum	Mean	SD
Intrapersonal	25.00	50.00	39.72	4.82
Bodily-Kinesthetic	25.00	46.00	37.90	3.80
Verbal-Linguistic	26.00	48.00	35.61	4.28
Naturalist	22.00	45.00	35.53	4.02
Musical-Rhythmic	26.00	45.00	35.34	3.69
Interpersonal	25.00	45.00	35.01	3.60
Logical-Mathematical	16.00	45.00	34.66	4.19
Visual	22.00	43.00	33.13	4.15
Existential	22.00	42.00	30.86	4.10

a. Age category = Pre-adulthood, ***N***=74

Intelligence	Minimum	Maximum	Mean	SD
Bodily-Kinesthetic	31.00	47.00	39.64	3.51
Intrapersonal	32.00	47.00	39.18	3.68
Musical-Rhythmic	30.00	44.00	37.94	3.22
Verbal-Linguistic	26.00	46.00	37.45	4.16
Interpersonal	28.00	43.00	36.12	3.37
Naturalist	29.00	43.00	35.27	4.12
Visual	26.00	45.00	34.97	4.06
Logical-Mathematical	26.00	43.00	34.64	3.48
Existential	21.00	38.00	30.91	3.56

a. Age category = Early-adulthood, ***N***= 33

Intelligence	Minimum	Maximum	Mean	SD
Intrapersonal	38.00	44.00	40.50	2.52
Bodily-Kinesthetic	38.00	44.00	40.50	2.52
Musical-Rhythmic	37.00	44.00	40.25	3.30
Visual	36.00	41.00	38.00	2.45
Verbal-Linguistic	36.00	41.00	38.00	2.16
Interpersonal	30.00	39.00	36.25	4.19
Logical-Mathematical	30.00	42.00	36.25	4.92
Naturalist	28.00	43.00	35.75	6.18
Existential	24.00	36.00	31.75	5.31

a Age category = Middle-adulthood, ***N***= 4

A principal components analysis (PCA) with a varimax orthogonal rotation was run to assess the construct validity of the OVEI. As the number of items in the OVEI were 17, a minimum of 85 respondents was required for running the factor analysis. The number of respondents was 111, which is far beyond the required minimum sample size and thus adequate for the factor analysis. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was **.92**, exceeding the recommended value of .6 by Tabachnick and Fidell (2013) and Pallant (2011). In addition, Bartlett's Test of Sphericity was statistically significant (p<.005), thus indicating the suitability of the PCA. An inspection of the screeplot revealed a clear break after the second component. Using Cattell's (1966) scree test, it was decided to retain two components for further investigation. The two-component solution explained a total of **53.96** of the variance, with Component 1 contributing **29.17** and Component 2 contributing **24.79.** The grouping items are presented in Table 3. The two distinct components are labelled as 'motivation' and 'learning experience'. The factor loadings for the Motivation component range between .60 and .82. The factor loadings for the Learning experience component range from -.32 to .36.

Table 3
Varimax Rotated Principal Component Factor Analysis Results for the OVEI (*N*= 171)

	Component		
Online Video Experience Inventory (OVEI) items	Motivation	Learning Experience	h^2
The use of online videos enriched the subject materials.	0.82	-0.08	0.68
The use of online videos in the subject enriched my learning experiences in this class.	0.80	-0.24	0.71
I would recommend video-assisted subjects to anyone taking this subject.	0.80	0.26	0.70
Online videos used in the subject contributed to my learning.	0.77	-0.05	0.59
Online videos provided me with valuable resources for this subject.	0.77	-0.27	0.66
I was able to learn effectively because of the mix of videos used in this subject.	0.74	-0.31	0.65
Using online videos helped me to reflect on what I was learning.	0.73	0.00	0.53
The use of online videos in the subject helped me understand the material better.	0.68	-0.33	0.58
Online videos are an asset to this subject.	0.65	0.36	0.55
Online videos helped me do better on assignments/exams.	0.65	0.41	0.59
The lecturer's links to online videos were valuable to my learning in this subject.	0.64	0.27	0.48
The use of online videos in the subject stimulated my interest in class sessions.	0.64	-0.50	0.65
My reviews of online videos improved my performance in the subject.	0.61	0.33	0.48
Online videos were a waste of time.	0.60	0.19	0.40
Online videos made the class feel more interactive.	0.54	-0.32	0.39
I wish the instructor had used more online videos.	0.41	0.31	0.27
I prefer learning through videos more than through an in-class lecture.	0.36	0.36	0.25
Total Variation	29.17	24.79	53.96

To find out whether there is a significant difference between the two genders in terms of their intelligences; Mann-Whitney U tests were used for the data and compared against two-tailed *p* values. The data revealed that only Logical-Mathematical [Mean rank= 46.72 (males) and 59.76 (females), *z* =-1.94, *p* (2-tailed)= 0.05] and Intrapersonal intelligences [Mean rank= 37.38 (males) and 63.54 (females), *z* =-3.89, *p* (2-tailed)= 0.00] were significant.

Mann-Whitney U tests were conducted between the pre and early adulthood groups for the different MI subscales. As recommended (Allen & Bennett, 2010; Pallant, 2011; Tabachnick & Fidell, 2013) a stricter alpha level of .05/3=0.017 was used. There were differences between pre-adulthood and early-adulthood for Musical-Rhythmic [Mean rank= 47.17 (Pre-adulthood) and 69.32 (Early-adulthood), *z* =-3.422, *p* (2-tailed)= 0.001, r= -0.33] and Bodily-Kinesthetic intelligences [Mean rank= 49.11 (Pre-adulthood) and 64.97 (Early-adulthood), *z* =-2.454, *p* (2-tailed)= 0.014, r= -0.24].

The components for the OVEI from the Principal Component Analysis were used to calculate their correlations with students' MI scores and age. For this purpose, the score of the nine MI subscales were initially added together to get an overall MI score for participants. After that, the correlations between the overall MI score, MI subscales, Age and the two components from the OVEI (Motivation and Learning Experience) were calculated and presented in Table 4.

Table 4
Pearson Product-Moment Correlation between Age of the Students, their Learning Experience and Motivation, and MI subscales (N=111)

	Learning Experience	Motivation	Overall MI	Intrapersonal	Bodily-Kinesthetic	Verbal-Linguistic	Musical-Rhythmic	Interpersonal	Naturalist	Logical-Mathematical	Visual	Existential	Age
Learning Experience	1												
Motivation	.48**	1											
Overall MI	.32**	.02	1										
Intrapersonal	.23*	-.02	.69**	1									
Bodily-Kinesthetic	.32**	.04	.78**	.52**	1								
Verbal-Linguistic	.08	-.11	.77**	.46**	.58**	1							
Musical-Rhythmic	.28**	-.02	.64**	.40**	.47**	.47**	1						
Interpersonal	.23*	.09	.75**	.34**	.51**	.61**	.35**	1					
Naturalist	.19*	.04	.73**	.44**	.43**	.47**	.34**	.58**	1				
Logical-Mathematical	.19*	-.05	.75**	.43**	.57**	.52**	.42**	.53**	.49**	1			
Visual	.32**	.09	.74**	.32**	.47**	.49**	.45**	.58**	.60**	.48**	1		
Existential	.23*	.08	.65**	.43**	.51**	.38**	.27**	.36**	.39**	.44**	.42**	1	
Age	.19*	-.16	.14	-.01	.18	.16	.34**	.09	-.09	.02	.21*	.07	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

As indicated in Table 4, the correlation between age and Learning Experience is r = 0.19, n = 111, p<.05 (2-tailed) and between Learning Experience and Motivation it is r =0.48, n = 111, p<.01 (2-tailed). The correlation between the MI scores and Learning Experience is r = 0.32, n = 111, p<.01 (2-tailed). The largest correlation is between learning experience and bodily-kinesthetic and visual-spatial intelligences r = 0.32, n = 111, p<.01 (2-tailed). The r values of these relationships according to Cohen (1988; cited in Pallant, 2011) would be small for the r value of 0.10 to 0.29 and medium for the values between 0.30 to 0.49 and large for the values of 0.50 to 1.0.

In addition, the relationship between the dependent variables of Motivation and Learning Experience and the independent variable of gender and mode of learning were explored. A 50% split for each of the dependent variables was undertaken, and resulted in two groups, namely high and low achievers for each of the variables (Motivation and Learning Experience). To explore the relationship between two categorical variables, a Chi-square test for independence is recommended (Pallant, 2011).

The Chi-square test for independence (with Yates Continuity Correction) showed no significant association between gender and learning experience status, χ^2 (1, n = 111) = 0.11, p = .74, *phi* = -.05 and between learning mode and learning experience status, χ^2 (1, n = 111) = 0.61, p = .44, *phi* = -.14. This means that the proportion of males' learning experience is not significantly different from the proportion of females' learning experience. There appears to be no association between learning experience status and gender.

Another Chi-squared test for independence was conducted to explore the difference in motivation of students based on their gender and learning modes. The Chi-square tests for independence (with Yates Continuity Correction) revealed no significant associations between learning mode and motivation status, χ^2 (1, n = 111) = 0.00, p = 1.00, *phi* = -.034 and gender and motivation status, χ^2 (1, n = 111) = 0.00, p = 1.00, *phi* = -.004.

DISCUSSION AND CONCLUSION

The descriptive results obtained from the MI profiles revealed that students are higher on Intrapersonal intelligence, as students in Lopez and Patron's (2012) study, and lower in Existential intelligence. Bodily-Kinesthetic and Musical-Rhythmic intelligences were also found as other highly developed intelligences of the current student sample. However, as noticed, some findings of the study about strength and weakness of students are not in complete agreement with other studies. For instance, Lopez and Patron (2012) report that students were higher in interpersonal intelligence and lower in verbal-linguistic and visual-spatial intelligences. As reported, Musical-rhythmic and logical-mathematical intelligences were other dominant intelligences of students. This different finding is perhaps because of the fact that they used a different instrument (a 30-item questionnaire), measuring only seven types of intelligences introduced by Gardner in 1983. In this study, the researchers utilized a validated questionnaire measuring all nine intelligences.

The finding revealed a significant difference between the MI profiles of respondents and their age category. It was revealed that the students in the pre-adulthood category are higher on Intrapersonal intelligence and lower in Existential intelligence. Early-adulthood respondents are higher on Bodily-Kinesthetic intelligence and lower in Existential intelligence. The middle-adulthood respondents are higher on Intrapersonal intelligence and lower in Existential intelligence. However, no significant difference was found between modes of delivery and intelligences. Although the Kruskal-Wallis Test showed significant differences between age groups and a number of intelligences, the interpreted effect size values of the findings revealed a small magnitude of the difference in the means except for the moderate effect size obtained for Musical-Rhythmic (r =0.33) of pre-adulthood and early-adulthood. Similarly, Meneviş and Özad (2014) have reported a significant difference between age and visual-spatial, logical-mathematical, intrapersonal, naturalist and existential intelligences. Although the findings do not share similar lower and higher intelligences, the reality of the influence of age on MI should not be ignored.

Further analyses, Mann-Whitney U tests between the two genders and MI subscales revealed a significant difference between gender and Logical-Mathematical and Intrapersonal intelligences. These findings are similar to studies (e.g., Meneviş & Özad, 2014) that have found a significant relationship between MI and gender and contrary to other studies (e.g., Lopez & Patron, 2012) that have found no significant difference between intelligence types and gender. For instance, Meneviş and Özad (2014) have reported a significant difference between different types of intelligence and gender among high school students. However, as Meneviş and Özad (2014) found that the type of intelligences seemed to be different among the students across different year levels of their studies as the findings could not be comparable to university students who already have demonstrated a level of intelligence and ability.

The correlation coefficient *r* values showed a negligible significant relationship between the two variables of Learning Experience and Age of the participants. The relationship between the two variables of Learning Experience and Motivation (r =0.48), Learning Experience and MI scores (r =0.32) and Learning Experience and bodily-kinesthetic and visual-spatial intelligences(r =0.32) were also moderately significant. The Chi-square findings revealed that there was no significant difference in students' gender and mode of learning identifiable among high/low achievers of both the motivation and learning experience variables.

Although the study limits its focus to students of both genders in Behavioural Sciences, collecting data proved to be problematic. After matching the data, the quantitative data revealed only 32 males (28.8%) and 79 females (71.2%). It was also revealed that 91 respondents were in first year, 13 in second year, 6 in third year and 1 respondent was in the final year. All the students were enrolled in some Psychology subjects. In this respect, due to the imbalances in the number of participants from the different year of study and gender, the findings cannot be generalized to other student cohorts or learning contexts. As the participants were mostly female, this could affect the observed multiple intelligences and their perceptions of online video use. According to Tapscott (2009),

current generation dominating universities (also called Net Generation) "is the largest, most ethnically diverse, and most female dominant college population to date" (p. 123).

According to researchers of this study, another aspect that needs consideration is student centeredness. There is a need for the debate to shift towards students and what skills and prior knowledge they bring to the classroom. What are the reasons for the students attending university? Is it to fulfil a life ambition to be a professional, or is it because their parents want them to be a teacher, psychologist, or engineer or is this their fifth choice on their Queensland Tertiary Admissions Centre (QTAC) form. Given the various student motivations, it is difficult for a lecturer to try and satisfy all their needs. Regardless of the changes happening in higher education, there is no doubt that students can still attend universities and enrol in subjects delivered without the extensive integration of new technologies. In essence, more empirical studies are needed to investigate students' motivational aims in attending the university and their engagement with their studies. To enhance the potential for generalizability of the findings, future studies might involve random samples from regional and urban educational institutions exhibiting similar and different demographic and institutional characteristics.

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