International Journal of
Psychology and
Educational Studies
www.ijpes.com

ISSN: 2148-9378

International Journal of Psychology and Educational Studies

Volume 6, Issue 2

May 2019

DOI: 10.17220/ijpes.2019.02

2019

International Journal of Psychology and Educational Studies, 2019, 6 (2), 1-14

PES

www.ijpes.com

International Journal of Psychology and Educational Studies

Exploring the Interaction between Science Teachers' Self-efficacy Beliefs and Pedagogical Discontentment: An Attempt to Understand Why Science Education Reform Fails

Yavuz Saka[1] & Nesrin Keklikçi[2]

[1] *Zonguldak Bulent Ecevit University Eregli Faculty of Education, Kdz Ereğli, Zonguldak, Turkey*

[2] *National Ministry of Education, Kizilcapinar Middle School, Kdz Ereğli, Zonguldak, Turkey*

ARTICLE INFO

Article History:
Received 01.03.2019
Received in revised form 12.04.2019
Accepted 25.04.2019
Available online 26.05.2019

ABSTRACT

Scientific literacy is currently one of the main purposes of science education. Science education reform efforts provide rich, comprehensive and explicit messages, ideas suggestions with teachers to promote scientific literacy through student-centered and inquiry-based instructional implementations. However, systemic change that reform aims to achieve yet to come through as most of the science teachers are still using teacher-centered lecture style science teaching rather than implementing reform initiatives. The purpose of this paper is an attempt to shed light on the existing literature to understand why science teachers would not employ reform initiatives in their classrooms. Teacher self-efficacy and pedagogical discontentment are selected to be the target constructs that the interactions between them hold promises to explore teacher averseness to reform. 130 science teachers working in public middle schools located in northern Turkey were participated in this research. The findings derived from this research provided several key interactions between self-efficacy beliefs and pedagogical discontentment in terms of the participating teachers' openness toward science education reform in Turkey. Methodological implications were also embraced.

Keywords:
Self-efficacy Beliefs, Pedagogical Discontentment, Science Education Reform

1. Introduction

Instructional and administrative perspectives have been respectively urging and initiating educational reform aiming gradual change in educational practice across the globe over decades. Our ultimate faith in education to resolve almost all problems observed in a society and to mold a better future for all citizens is the main reason for such consistent efforts for educational reform. In his master piece with Tyack, Cuban called this ongoing reform era as "Tinkering toward Utopia" (Tyack & Cuban, 1995) as in spite of the great efforts and expectations, the reform barely alters the educational practices.

To avoid costs of earlier reform attempts in science education, classroom implementations of reform should not be taken for granted as lack of attention given to classroom practices more likely results in failure of reform. Smith and Southerland (2007) suggested that teachers should be the center of reform efforts and their beliefs about reform and teaching science in specific to ensure deeper change in classroom practices to promote scientific literacy. Highlighted by the relevant literature, beliefs that are crucial to science education

[2] Corresponding author's address: Zonguldak Bulent Ecevit University, Eregli Faculty of Education, Kdz Eregli Zonguldak/Turkey
Telephone:+ (90) 531 220 30 55
Fax: + (90) 372 323 8693
e-mail:sakayavuz@gmail.com
http://dx.doi.org/10.17220/ijpes.2019.02.001

reform consist of teachers' underlying assumptions about what to teach, how to teach, how to assess students' learning, how students learn science best and how to scaffold learning environment to promote effective learning experiences as well as their self-conception about their roles as science teachers to promote scientific literacy (Luft and Roehrig, 2007).

Beliefs are recognized to be the preeminent indicators of individuals' actions in their lives (Bandura, 2000) and "…self-efficacy refers to beliefs in one's capabilities to organize and execute the courses of action required to given attainments." (Bandura, 1997, p.3) Thus, found to be useful in examining science teachers' classroom implementations, there are different arguments across the relevant literature about how self-efficacy beliefs that teachers hold play a role in promoting teacher growth and advancing school reform as well. Some argue that to comply with immense challenges by reform's deeper change requirements on teacher shoulders, only the science teachers with high self-efficacy are more likely to facilitate and successfully implement reform-based and student-centered approaches in their classrooms compare to their counterparts (Donnel and Gettinger, 2015; Duran et al., 2009; Fogleman et al. 2011; Guskey, 1988; Hodges, Gale& Meng (2016). However, several researchers reveal that science teachers with high self-efficacy are more likely to resist new offerings of reform as they often feel lack of pedagogical discontentment over what they do in their daily base instructions and thus do not intend to change (Favre and Knight, 2016; Gregoire, 2003, Southerland et al., 2011; Wheatley, 2000, 2002).

The interrelatedness between teachers' self-efficacy and their sense of dissatisfaction lately recognized to be an important venue to explore success of science education reform. The purpose of this research is twofold; a) to explore the correlation between science teachers' self-efficacy beliefs and pedagogical discontentment and the direction of the correlations among the subscales of each construct, b) if the degree of science teachers'' self of self-efficacy beliefs show any difference in the science teachers' pedagogical discontentment that provide a plausible venue to understand their receptiveness and fidelity to reform implementations. The ultimate goal of this paper is to get a glimpse of long time failure of science education reform in Turkey where reform efforts have been one of the main phenomena in education for the past two decades.

2. Conceptual Framework

This section is an attempt to structure theoretical underpinnings of this research through exploring salient constructs including science education reform, teacher self-efficacy and pedagogical discontentment.

2.1 Science Education Reform

Perhaps, followed by other fields, science education appears to experience the most persistent and comprehensive reform initiatives (e.g. AAS, 1990, 1993; NGSES, 2013; NRC, 1996, 2000, 2002) and suggestions offering a cohesive guidance to improve science teaching and learning as science is a field of knowledge understood to be the center of each country's ability to develop sustainably. Emphasis given the scientific literacy for all citizens through inquiry-based instruction is observed to be the primary theme of the latest science education reform recommendations urging a systemic shift and change in the purpose and methods of science education. Based on the reform suggestions, teachers were asked to adjust or change their practices to conform reform expectations by shifting from textbook-oriented, teacher-centered instruction to student-centered, inquiry-based instruction.

Indeed, substantial amount of reform investments provided science teachers with pedagogical ideas, model curricula and supplementary documents to teach science through student-centered instructions. In spite of their rich, unified and explicit nature, science education reforms are yet to yield expected results as for Berkovich (2011), teachers often resist to change. Berkovich (2011) argued that teachers who resist to reform simply find reform as unnecessary and do not agree with the reform objectives. Instead of enacting reform recommendations, science teachers surprisingly with an updated reform terminology (Saka, 2009) often tended to teach science through teacher-centered approaches by narrowing the overarching purposes of reform into classroom organization, worksheets and isolated activities mainly called by teachers as hands-on activities in their classrooms. A close look by Spillane (1999), when teachers are asked to utilize reform in their daily instructions, they left alone to make sense of new materials and ideas brought to them by reform.

For Spillane (1999), in the reform era teachers often have difficulty of turning reform initiatives into real life learning experiences in their classrooms. Drawing on their prior experiences and beliefs, teachers likely embed reforms ideas with their existing perceptions and practices failing deeper pedagogical underpinnings of reform.

2.2. Interaction of Self-Efficacy Beliefs and Reform

Beliefs are realized to be critical characteristics of teachers significantly influencing their instructional decisions and practices. Conceptualized by Bandura (1986), self-efficacy beliefs are individual's judgment of their abilities to organize and implement predefined tasks. Literature illustrates a close link between science teachers' self-efficacy beliefs and their classroom implementations (Miller, Ramirez and Murdock, 2017). Teachers with high self-efficacy beliefs are recognized to better orchestrate instructional activities with a greater flexibility (Gabriele & Joram, 2007) to promote student learning compare to those who have low self-efficacy (Caprara, Barbaranelli, Steca, & Malone, 2006). Malmberg, Hagger and Webster (2014) explored how teachers' self-efficacy beliefs were related to student achievement and they found that teachers with high self-efficacy beliefs performed more mastery and effort in supporting student learning by seeking and facilitating better learning experiences to respond to their students' needs. In a larger study, Fackler and Malmberg (2016) explored 14 OECD countries to understand various different factors effecting teachers' self-efficacy and student achievement. They found that teachers with high self-efficacy beliefs were able to accommodate student learning needs to foster their achievement as they were more eager to explore alternative instructional approaches compare to the teachers with low self-efficacy beliefs.

Being open to innovative and alternative ways of teaching, it is argued that teachers with high self-efficacy beliefs are more open to reform. As described by Czerniak (1990), highly efficacious teachers are more likely to adopt reform-based teaching strategies as opposed to teachers with low self-efficacy. Also, along with their pedagogical competencies and professional development experiences, Donnell and Gettinger (2015) described that self-efficacy beliefs contribute to teachers' positive perceptions of reform and amenability to change. Therefore, Fogleman, McNaill and Krajcik (2011) indicated that teacher self-efficacy is an important predictor of the successful implementation of reform efforts as teachers who believe they are able to achieve specific teaching goals, which refer to high self-efficacy, are more willing to try new approaches in their classrooms.

Although empirical research has largely supported the claim that teachers with high self-efficacy are more likely to feel ownership of reform and enhance student achievement compare to teachers with low self-efficacy are, there remain empirical evidences that high efficacious teachers are more likely to resist reform practices (Kahveci, Kahveci, Mansour and Alarfaj, 2018; Lardy & Mason, 2011; Saka, 2007; Southerland, Sowell, Blanchard and Granger, 2011; Wheatley, 2000). For instance, Favre and Knight (2016) found that teachers with high self-efficacy showing low fidelity and little dedication to reform implementations illustrate diminutive effort to create student-centered classroom environments or engage their students in reform-based practices. For Wheatley (2002), high self-efficacy restricts teachers' receptiveness of school reform as high self-efficacy limits teachers to doubt about their existing practices.

Indeed, reform initiatives demand teachers to make significant changes to their instructional decisions and actions. Teacher change literature elucidates that for teachers to make any profound change in their daily-based practices, they need to problematize their teaching through critical reflection on their own instructional practices (Southerland, Nedelson, Sowell, Saka, Kahveci and Granger, 2012). For Settlage, Sotherland, Smith and Ceglie (2009), it is seldom for efficacious teachers to reflect on their instructional practices critically; consequently they face limited dissatisfaction with their pedagogical practices. As stated by Wheatly (2002), teachers' own awareness of ineffective teaching practices where there is a significant gap between teachers' instructional goals and their student outcomes would not be possible if teachers have a high self-efficacy.

2.3. Interaction of Pedagogical Discontentment and Reform

Models for teacher change aroused and fed by conceptual change literature reveal that external requests and mandates are unsuccessful to motivate teachers to fully take the ownership of reform and act accordingly (Bruce & Ross, 2008, Hollenback & Kalchman, 2013). Rather, effective results in convincing teachers to internalize and utilize reform implementations with fidelity, teachers need to recognize the gap between their beliefs, goals and practices and the student learning outcomes (Gess-Newsome, Southerland, Johnston and Woodbury, 2003) and feel dissatisfaction over what they know, believe and do in school context (Wheatly, 2002). Southerland et al. call this sense of dissatisfaction as pedagogical discontentment distinguishing it from contextual discontentment, which includes teachers' beliefs about external factors such as unsupportive administration, lack of supplies, time and space constraints and accountability measures adversely effecting teacher practices and student learning (Sowell, Southerland & Granger, 2006). Pedagogical discontentment, on the other hand, is related to teachers' beliefs about their pedagogical competencies including their ability to teach content through inquiry-based approach, to teach content for all ability level of students, to have appropriate level of science content knowledge, to be able to distinguish content issues being breadth versus depth based on student needs and to assess student learning through multiple assessment strategies based on the target skills (Southerland et al.,, 2012).

Research focusing teachers' pedagogical discontentment emphasizes the pedagogical competencies of teachers to successfully facilitate reform-based implementations. Being a relatively new construct, researchers often use pedagogical discontentment as a cognitive tool to explore teachers' receptiveness of reform initiatives (Kahveci et al., 2018; Olitsky, 2015) as well as their openness to areas where they realize their shortcomings to comply with reform and effective instructional outcomes (Koksal and Southerland, 2018; Saka, 2007; Sunal, Hodges, Sunal, 2010).

It is argued that openness to new ideas and suggestions, teachers' sense of pedagogical discontentment seems to be a pivotal factor as they need to feel sense of discontentment precondition for them to refine their practices through search for alternatives. Focusing on two reform-minded novice science teachers, Saka (2007) found that there is an important link between teachers' sense of pedagogical discontentment and their openness to new ideas from others as teacher with lack of discontentment rejected most of the ideas and offerings from other teachers, school administration and his college professor to help him overcome the issues that the teacher faced in his classroom. On the other hand, teacher with pedagogical discontentment appear to cooperate with his colloquies to find better ways to handle the issues that are common in the first years of teaching. Kahveci et al. (2017) also found the same link as their quantitative study with 994 science teachers illustrated that the level of pedagogical discontentment that teacher experience has a positive correlation with their attainment to reform suggestions as teachers with high pedagogical discontentment were observed to be more open to reform suggestions compare to their counterparts. Focusing on Turkish science teachers, in a qualitative study Koksal and Southerland (2018) focused on three science teachers with moderate level of pedagogical discontentment and they explored that all science teachers were willing to professional development opportunities.

2.4. Interrelatedness of Self-efficacy Beliefs, Pedagogical Discontentment and Reform

Reform literature attempting to understand the failure of reform initiatives emphasized that teacher self-efficacy beliefs holding direct influence on shaping teacher practices. Most of the earlier self-efficacy literature argued that high self-efficacy is a good attribute for teachers to implement new ideas suggested by reform. However, number studies discussed earlier argued that teachers with high self-efficacy appeared to be the most reluctant group to reform as their level of comfort by the high self-efficacy restricts them to change their instructional practices. Again the reform literature also argues that in order for teachers to make any deeper change in their instructional practices, they need to feel pedagogical dissatisfaction with their instructional practices. This prerequisite would allow them to search for alternatives or better ways to address the gap between their instructional goals and the student outcomes in their classroom. Unless they feel such discontentment, systemic change in educational system would not be possible (Settlage et al., 2009).

Drawing upon the findings of relevant literature, several combinations of teacher self-efficacy and pedagogical discontentment were idealized for teachers to successfully implement reform initiatives in their classrooms. Some argue that teachers with pedagogical discontentment and high self-efficacy are more receptive to reform initiatives (Gess-Newsome et al., 2003; Sowell et al., 2006). However, Saka (2007) found that high self-efficacy may not allow teachers to feel a sense of pedagogical discontentment that is required for them to be receptive to reform suggestions. As for Saka (2007) a science teacher with a combination of moderate level of self-efficacy and appropriate level of pedagogical discontentment allowed him to better adopt his instructional practices to reform suggestions compare to the teacher with high self-efficacy and moderate appropriate level of pedagogical discontentment. It is argued that self-efficacy plays significant role in teacher change as high self-efficacy prevents teachers to problematize their teaching and thus to prioritize change (Settlage et al., 2009). Kahveci et al. (2018) also reported that teachers with low self-efficacy and appropriate level of discontentment are more likely to take up messages of reform.

Although combination or integration of teachers' self-efficacy and pedagogical discontentment appears to be a salient one for teacher change, there is a scarcity and uncertainty of literature defining the nature of such integration. The ambiguity is the level of self-efficacy required to allow appropriate amount of pedagogical discontentment cultivating teacher change and contributing the success of reform. As an attempt to shed light on the science education reform literature, this research aims to a) explore the relationship between science teachers' self-efficacy beliefs and their sense of pedagogical discontentment and b) describe which levels of teacher self-efficacy (low, moderate or high) is more fertile to promote teacher pedagogical discontentment as a key attribute of teachers for systemic change and progress. Using Turkish context to achieve these purposes, the leading questions for this research,

1. What is the relationship between science teachers' self-efficacy beliefs and their pedagogical discontentment?
2. Is there any significant difference in science teachers' pedagogical discontentment based on different levels of self-efficacy beliefs that they hold?

3. Methods

To determine, at least, one reason for the unsatisfied teacher attainment to reform implications in Turkey, this study explored science teachers' self-efficacy beliefs and their pedagogical discontentment and possible relationships and interaction between them by using survey research methods. In order to ensure fidelity of the given responses, the data were collected by the researchers through face to face intercourse in participating teachers' work places during 2017-2018 academic year.

3.1. Research Context

This study was carried on in a midsize city located in the northern Turkey. Turkey has been one of the countries that continuously seek out ways to improve the quality of education through educational reform for several decades. Aligned with the international trend and relevant literature, centralized science education curriculum being utilized in all public and private schools across the country was reformed four times during past 15 years by Ministry of National Education to make sure that the scientific literacy level of the population was increased through inquiry-based science education. The newest science curriculum was taken part in 2018. However, these reform initiatives barely altered the science teaching and learning practices as recent studies report that in spite of the immense efforts from Ministry of National Education, it is observed that science teachers mostly prefer teacher-centered and textbook oriented approaches to teach science (e.g. Bardak & Karamustafaoglu, 2016; Demirkan & Saraçoğlu, 2016; Uzal, Erdem & Ersoy, 2016).

3.2. Participants

Of the 237 science teachers working at the public school system of a city where the research was done, 130 teachers voluntarily accepted to participate in the study. All of the participants were teaching science in the middle school level from 5th to 8th grade levels. As shown in Table 1, gender distribution of the participants included 30% (n=40) male and 70% (n=90) female science teachers.

Table 1. Teacher demographics

(N=130)		*f*	%
Gender	**Male**	40	31
	Female	90	69
Work experience	**0-3**	23	18
	4-10	51	39
	11-15	25	19
	16-35	31	24
Certification	**Science education major**	103	79
	Non-major (out of field)	15	12
	Non-education majors	12	9
Location of the work place	**Urban**	104	80
	Rural	26	20

The work experience of the participants ranged from 0-3 years 18% to 16-35 years 24%mostly having teaching experience in the range of 4-10 years (39%). Based on the certification of the participants, most of them were science education majors (79%) and 12% of them were certified teachers from out of science education major and about %10 of them were non education majors. Of the 130 participants, 80% of the teachers (n=104) were working at schools located in urban areas, while 26 of them (20%) were teaching in rural area schools.

3.3. Data Collection

The data were collected through 2017-2018 school year by utilizing two instruments and a demographic questionnaire. To ensure the fidelity of the given responses, the data collection tools were utilized face to face manner with the consent of the science teachers. To ascertain participating science teachers' self-efficacy beliefs, Science Teachers Efficacy Beliefs Inventory (STEBI) was used. The original instrument was developed by Riggs and Enochs (1990) and widely used across the science teachers to assess science teachers' self-efficacy beliefs. The inventory was adapted to Turkish language by Erden (2007) to assess science teachers' self-efficacy beliefs through two subscales including personal science teaching efficacy (PSTE) and science teaching outcome expectancy (STOE) with a total 20 5-point likert-type items. The Cronbach's Alpha values for the total scale as well as PSTE and STOE subscales were found to be 0.71, 0.78 and 0.60, respectively (Erden, 2007). In this research, however the Cronbach's Alpha values for the whole scale, PSTE and STOE were found to be 0.83, 0.78 and 0.76 respectively.

In order to gauge participating science teachers' pedagogical discontentment, developed by Southerland, Sowell, Kahveci, Granger and Geade (2006) and adopted to Turkish language by Adigözel (2012) with satisfying reliability and validity assurances the Pedagogical Discontentment instrument was administered. Using a total of 19 five-point likert-type items, the instrument measures science teachers' pedagogical discontentment divided into 5 subscales namely 1) teaching content through inquiry-based approach (IB, 3 items), 2) teaching content to all ability levels of students (AL, 6 items) 3) having appropriate level of content knowledge (SC 3 items), 4) balancing and resolving content issues being depth versus breadth based on student needs (DB, 4 items) and 5) assessing student learning through multiple assessment strategies based on the target skills (AP). The reliability of the adopted instrument was reported for the overall instrument and for its subscales' Cronbach's Alpha as 0.94, and 0.83 for the IB subscale, 0.79 for the AL subscale, 0.82 for the SC subscale, 0.68 for the DB subscale and 0.76 for the AP subscale. In this research, reliability Cronbach's Alpha for the subscales were calculated as 0.94, 0.84, 0.92, 0.89, 0.90 respectively and 0.93 for the overall instrument.

3.4. Data Analysis

Analysis of the data included reporting descriptive statistics and, correlation and variance analysis. Before the analysis started, the data set was initially treated for missing values which were approximately .05% of the entire data set. To increase the sample size without significantly changing the mean scores, linear interpolation method was used to infer missing data making only a non-significant trivial change in the correlation coefficient and mean scores. Then, the results of skewness/kurtosis and Shapiro-Wilks tests ($p>.05$) confirmed that the data were normally distributed for each group, therefore for the rest of the analysis parametric tests were utilized.

Correlation statistics were calculated in order to answer the first research question. Specifically, correlations between science teachers' self-efficacy beliefs and their pedagogical discontentment, mean scores and correlations between their subscales were calculated. . In order to answer the second research question, the participating science teachers' self-efficacy beliefs were categorized in into three categories as low, moderate and high based on literature. As shown in Table 3, teachers having self-efficacy z-score smaller than "-1" were coded as teachers having) low level of self-efficacy while teachers having a z-score between -1 and +1 were coded as teachers having moderate level of self-efficacy. And the final category was identified as high self-efficacy level (coded as 3) where the standard scores of the participants' self-efficacy beliefs were greater than +1. Of 130 science teachers participating in this research, 22 science teachers (16.9%) were coded under low self-efficacy category while 85 of them (65.4%) and 23 of them (17.7%) were respectively coded as moderate and high self-efficacy categories. After defining the self-efficacy levels of the sample, finally, one-way ANOVA analysis was conducted to explore if there were any significant difference in pedagogical discontentment of teachers falling into low, medium and high level of self-efficacy categories. Significant ANOVA results were followed by Tukey's post-hoc analyses.

4. Findings

4.1. Correlation between Self-efficacy beliefs and Pedagogical Discontentment

Initially, based on univariate analyses of variance including independent-samples t-test and one-way ANOVA, between (gender and school location) and among (work experience and certification) the categories listed under each demographic characteristic of the participating science teachers, there were no significant differences found in terms of these teachers' self-efficacy beliefs and pedagogical discontentment.

The first research question was an attempt to explore the correlation between teachers' self-efficacy beliefs and their sense of pedagogical discontentment. As seen in Table 2, there was a negative and statistically significant correlation between participating science teachers' self-efficacy and pedagogical discontentment mean scores ($r = -0.381$, $p < 0.01$). This indicated that an increase in participating science teachers' self-efficacy mean scores was associated with a decrease in their pedagogical discontentment mean scores. Such negative and statistically significant correlations were also observed between the teachers' self-efficacy and the pedagogical discontentment subscale scores as well. Specifically, except for the correlation between teachers' self-efficacy and SC subscale ($r = -0.212$, $p<0.05$), which was statistically significant at an alpha level of 0.05, all of the correlations were statistically significant at an alpha level of 0.01 ($p<0.01$). These correlation coefficients implied that if the participating science teachers' overall self-efficacy scores increase, these teachers' pedagogical discontentment scores including all subscales and the pedagogical discontentment overall mean scores decrease.

Table 2. Correlation coefficients between participating teachers' self-efficacy belief scores (including self-efficacy subscales) and these teachers' pedagogical discontentment scores (including pedagogical discontentment subscales)

Scales and Subscales	PD_AP	PD_IB	PD_DB	PD_SC	PD_AL	PD_MEAN
PSTE	-0.311**	-0.448**	-0.332**	-0.296**	-0.379**	-0.422**
STOE	-0.084	-0.168	-0.096	0.050	-0.086	-0.099
SE_MEAN	-0.286**	-0.434**	-0.309**	-0.212*	-0.341**	-0.381**

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

As far as the correlation of participating teachers' PSTE subscale scores with their pedagogical discontentment mean and its subscale scores, similar pattern was observed. The participating science teachers' PSTE scores illustrated negative and meaningful correlation with mean scores of AP subscale ($r = -0.311$, $p < 0.01$), IB subscale ($r= -0.448$, $p < 0.01$), DB subscale ($r = -0.332$, $p < 0.01$), SC subscale ($r = -0.296$, $p < 0.01$), AL subscale ($r = -0.379$, $p < 0.01$) and pedagogical discontentment mean scores ($r = -0.422$, $p < 0.01$). This finding suggests that when the efficacy of the participating teachers decreases, their pedagogical discontentment increases significantly at all subscales of pedagogical discontentment and overall pedagogical discontentment mean scores as well.

In terms of these teachers' STOE scores, these teachers' STOE scores were negatively correlated with the pedagogical discontentment mean scores and with all pedagogical discontentment subscales as well except for SC subscale. However, as opposed to their self-efficacy mean and PSTE subscale scores, the STOE scores of the participating science teachers' correlation with pedagogical discontentment mean and with its subscales showed no significance. This means that with no statistical significance, the STOE of these teachers negatively affect the change in their sense of pedagogical discontentment except for SC subscale.

4.2. Effect of Self-Efficacy Belief Level on Pedagogical Discontentment

For the second research question, a one-way ANOVA was conducted to compare the effect of different science teacher self-efficacy beliefs on these teachers' sense of pedagogical discontentment as a prominent construct to assess their openness to reform initiatives. Homogeneity of variance assumption was tested by Levene's test [F (2, 127) = 1.065 p=0.348] which indicated that the variance of participating teachers' pedagogical discontentment across self-efficacy groups were not significantly different. Also, visual inspection of data showed no significant deviation from normal distribution.
Table 3 includes the descriptive statistics of participating teachers' self-efficacy belief levels.

Table 3. Descriptive values of transformed self-efficacy belief categories

Self-Efficacy level	N	$\bar{X}$	SD
1 (Low) (z<-1)	22	2.5247	0.45966
2 (Moderate) -1≤z ≥1	85	2.1542	0.62849
3 (High) z>1	23	1.8860	0.76773
Total	130	2.1694	0.65432

Based on the table teachers with low self-efficacy beliefs appeared to have higher mean score (mean =$\bar{X}$, $\bar{X}$ = 2.5247 = 2.5247, SD = 0.45966) compare to science teachers with moderate ($\bar{X}$ = 2.1542, SD = 0.62849) and high ($\bar{X}$ = 1.8860, SD = 0.76773) self-efficacy beliefs.

Table 4. Analysis of variance (ANOVA) for the effect of self-efficacy belief variables on pedagogical discontentment

Sources of Variance	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.645	2	2.322	5.831	0.004
Within Groups	50.584	127	0.398		
Total	55.229	129			

ANOVA results are shown in Table 4 showed that there was a significant effect of teachers' self efficacy levels on teachers' pedagogical discontentment [F (2, 127) = 5,831 p=.004]. This implies that science teachers' sense of pedagogical discontentment appeared to be significantly changing based on their self-efficacy beliefs.

In order to further explore the differences among self efficacy levels post hoc comparisons were conducted. As seen in Table 4, the results of Tukey (HSD) test showed that there was a significant difference between low self-efficacy beliefs and moderate self-efficacy beliefs (p = 0.041) indicating that teachers having low self-efficacy beliefs felt more pedagogical discontentment than teachers with moderate self-efficacy beliefs did.

Table 5. Multiple comparisons between self-efficacy groups by Tukey post hoc comparisons

(I) Self-Efficacy Categories	(J) Self-Efficacy Categories	Mean Difference (I-J)	Std. Error	p	Meaningful Difference
Low	Moderate	0.37054*	0.15097	0.041	Low-Moderate, Low-High
	High	0.63876*	0.18821	0.003	
Moderate	Low	-0.37054*	0.15097	0.041	
	High	0.26821	0.14834	0.171	
High	Low	-0.63876*	0.18821	0.003	
	Moderate	-0.26821	0.14834	0.171	

*. The mean difference is significant at the 0.05 level (2-tailed).

Similarly, the teachers with low self-efficacy beliefs also had more pedagogical discontentment compare to the teachers with high self-efficacy beliefs (p = 0.003) did as well. However, the Tukey test results indicated that there was no a meaningful difference between the science teachers with moderate self-efficacy beliefs and the science teachers with high self-efficacy beliefs (p = 0.171) in terms of their pedagogical discontentment. This finding implies two crucial outcomes that a) as being more receptive to reform efforts, teachers with low self-efficacy appeared to be more pedagogically discontented than teachers' with moderate and high levels of self-efficacy beliefs and b) teachers with moderate and high self-efficacy beliefs had relatively low pedagogical discontentment meaning that they appeared to be less open to reform efforts.

5. Discussion

Based on the findings, there was a negative and statistically significant correlation between Turkish science teachers' self-efficacy beliefs and their sense of pedagogical discontentment. As the participating teachers' self-efficacy beliefs increase their pedagogical discontentment decreases. This finding is congruent with related literature. In their study focusing on Saudi science teachers' openness to educational change through examining the interaction among science teachers' self-efficacy beliefs, pedagogical discontentment and intentions to reform, Kahveci et al. (2018) confirmed this negative correlation between science teachers' self-efficacy beliefs and their pedagogical discontentment. In another study, while exploring the initial states of applicants to professional development activity designed for science teachers; Saka (2013) explored the negative correlation between the applicant science teachers' self-efficacy beliefs and their pedagogical discontentment.

No research was found to compare the findings of this research in terms of the correlation between the subscales of self-efficacy beliefs and pedagogical discontentment. The negative and statistically significant correlation was also observed between the self-efficacy's PSTE subscale and all subscales of pedagogical discontentment including the mean scores of the participating teachers' pedagogical discontentment. In spite of overall negative correlation except for science content knowledge subscale (SC), the correlations between participating science teachers' STOE scores and their pedagogical discontentment subscale scores including pedagogical discontentment mean scores were not statistically significant. This was attributed the nature of items used to measure efficacy beliefs (Favre and Knight, 2016) in general and outcome expectancy (Williams, 2010) in specific. Paying attention to self-efficacy as a causal determinant of behavior at the expense of expected outcomes (Bandura, 1997), Williams (2010) argued that items measuring outcome expectancy were seldom designed to clearly relate the expected behavior or result that are firmly related ones' judgments about the possibility of outcomes that yield from their behavior. Items used to measure outcome expectancy that are focusing on distal outcomes, instrumental, positive target behaviors may result in researchers to get slender glimpse of outcome expectancy. The negative but not statistically significant correlation between participating science teachers' outcome expectancies and their sense of pedagogical discontentment can be ascribed to the nature of STEBI's STOE scale items as being mostly positive (6 out of 7) and including lack of proximal and affective statements.

As an attempt to explore the relationship between science teacher self-efficacy and their pedagogical discontentment in detail, the findings of this research broadened the findings of Kahveci et al. (2018) and contradicted with results of Southerland et al. (2011). Expanding the discussion to understand which level of self-efficacy yielding pedagogical discontentment as a requirement for successful implementations of reform, findings derived from this research illustrated that teachers with low self-efficacy differed from teachers who held moderate and high level self-efficacy. As Kahveci et al. (2018) categorizing the self-efficacy levels by dividing the possible self-efficacy states into two categories, found that teachers who were more open to reform appear to be the ones with low self-efficacy.

Southerland et al. (2011) on the other hand argued that the most appropriate state of pedagogical discontentment for teachers to be open to reform was noted with the teachers who had moderate level of self-efficacy. In his earlier study Saka (2007) also argued that it is more likely that teachers with moderate level of self-efficacy tended to have greater pedagogical discontentment and thus to be more open to reform compare to their counterparts. However, contradicting with these earlier findings, this research illustrated that teachers with low self-efficacy differed from their counterparts as having greater sense of pedagogical discontentment possibly being more open to reform initiatives as opposed to the teachers with moderate and high levels of self-efficacy.

Going back to the demographics of the participating teachers in terms of the categories in self-efficacy beliefs, the number of teacher who held low self-efficacy beliefs appears to be way too short compare to the number of teachers with moderate and high self-efficacy beliefs. The overwhelming literature on preservice education constantly argued that higher self-efficacy would be a good attribute for teachers to start their teaching for many reasons such as increased student achievement. The vast amount of literature attempting to increase teacher self-efficacy beliefs seems to be successful as the number of teachers with moderate and high self-efficacy overweights the teachers with low self-efficacy particularly in this research. This situation would be considered as a disadvantage for the sake of reform implementations as the greater amount of teachers appears to have moderate and high self-efficacy beliefs possibly feeling lack of pedagogical discontentment over their instructional practices and thus refusing to change and refuting the reform suggestions.

6. Implications and Further Research

To alter science education toward promoting scientific literacy, emphasis on the interaction between science teachers' self-efficacy beliefs and their sense of pedagogical discontentment is essential. Reform suggestions often urge teachers to change their existing teaching practices. Teacher change, indeed, is not an easy task. Without prioritizing deeper underpinnings of reform, teachers often prefer to draw on their existing beliefs and practices known to be the primary reason for reform to fail. Significant amount of pedagogical discontentment with their existing instructional practices appears to be a requirement for science teachers to be open to reform ideas. This research illustrated that science teachers' self-efficacy beliefs significantly interacted with their sense of pedagogical discontentment as the low self-efficacy beliefs appeared to allow teachers to problematize their teaching and feel some degree of pedagogical discontentment. It would be suggested to science teacher educators as well as teacher professional development designers to primarily focus on opportunities for teachers to explore their pedagogical shortcomings and their ineffective classroom applications to recognize their inadequacies in science teaching. Recognition of inadequate instructional practices followed by a sense of pedagogical discontentment may allocate teachers to critically question their capability of achieving effective science teaching and ensuring successful student outcomes aligned with reform. Unless they problematize their existing pedagogical competencies, it would be difficult for teacher seek for alternatives and thus to take on the reform initiatives. Mindful of this critical point, further research focusing on venues to promote teachers' reflection on their inadequacies, pedagogical contradictions and cognitive dissonances is essential. Teacher educators and teacher professional development actors ought to create opportunities for teachers to recognize the purpose of reform and how to comply with the reform through a balance between self-efficacy and pedagogical discontentment.

Another implication would be to the self-efficacy beliefs researchers to better define outcome expectancy as a construct theoretically having causal influence on individuals' self-efficacy beliefs. Instruments aiming to assess teachers' outcome expectancy should exclusively distinguish the factors effecting outcome expectancies related to ones capabilities when deciding the course of action from other contextual factors. Further research is required on developing reliable and valid tools to measure outcome expectancies as empirical evidence here in this research showed trivial relevance of outcome expectancy to teachers' self-efficacy beliefs in general.

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International Journal of Psychology and Educational Studies, 2019, 6 (2), 15-25

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International Journal of Psychology and Educational Studies

The Romanian Version of the Revised Youth Purpose Survey (RYPS): Psychometric Evaluation for Emerging Adults

Beatrice Adriana Balgiu

University Politehnica of Bucharest, România
Department of Career and Educational Training

ARTICLE INFO

Article History:
Received 16.01.2019
Received in revised form 20.04.2019
Accepted 30.04.2019
Available online 26.05.2019

ABSTRACT

The present article looks into the psychometric properties of the Revised Youth Purpose Survey (RYPS) in the case of a group of Romanian students emerging adults (N = 500). RYPS is a ten-item scale made of two sub-scales which measure Purpose Exploration (4 items) and Purpose Commitment (6 items). Confirmatory factorial analysis indicated an adequate fit of a two-factor model (GFI = .96; AGFI = .94; RMSEA = .057). This structure was confirmed and it was invariant for gender. Cronbach's alpha coefficients show good internal consistency: .87 (Purpose Exploration subscale) and .77 (Purpose Commitment subscale). The correlations of both scales of RYPS with validation measures of psychological and subjective well-being and of identity orientations were positive, indicating good convergent validity. The study validated the conceptual vision of the authors of the instruments in a previously unstudied cultural context.

Keywords:
validation; purpose; RYPS; purpose exploration; purpose commitment

1. Introduction

Setting and achieving one's purposes in life are essential for the individual's life during the transition period to maturity. In the domain of psychology, the topic of the purpose as a motivational force was much researched on (Frankl, 1959; Hayes, Strosahl, & Wilson, 1999; Yalom, 1980), given its importance for adolescence (Bronk & Finch, 2010; Bronk, Finch, & Talib, 2010; Yeager & Bundick, 2009; Yeager, Bundick, & Johnson, 2012) and emerging adulthood (Bundick, 2011; Damon, 2008; Massey, Gebhardt, & Garnefski, 2008; Sumner, Burrow, & Hill, 2015). The construct of "purpose" typically entails: 1) aim, as a quality indicating an intention related to a long-term goal and 2) engagement, as an internal motivation to be active in the pursuit of the personally meaningful aim (Bronk et al., 2010; Damon, Menon, & Bronk, 2003; Moran, 2009).

According to Damon (2008), a purpose in life is a stable and generalized intention to achieve something that is simultaneously significant for oneself and leads to productive engagement with the world beyond oneself. McKnight and Kashdan (2009) put forth an additional definition which describes the purpose as a central and self-organized aim in life that organizes and stimulates goals, manages behaviours, and provides a sense of meaning. Establishing a purpose in life is considered a central aspect of one's existence since it strongly influences one's identity; it is also considered self-organising because it has a paradigm that informs an individual's daily behaviour. As such, the purpose influences the behaviour and it has a great impact on one's conception of and direction in life.

The relevance of the studies on one's purpose in life has been demonstrated in most papers by means of associating it with well-being and identity. Thus, certain pieces of research considered that the purpose is an

[1] Corresponding author's address: University Politehnica of Bucharest, Department of Career and Educational Training for Social and Human Sciences, Splaiul Independenţei, 313, Bucuresti, sector 6, România

e-mail: beatrice.balgiu@upb.ro
http://dx.doi.org/10.17220/ijpes.2019.02.002

important aspect of eudaimonia (Ryan & Deci, 2001), or psychological well-being (Ryff, 1989; Ryff & Singer, 1998), and consequently, a reflection of one's psychological flourishing and of one's life led in accordance with one's values. Research has shown that the fulfilment of one's purpose is associated with a higher degree of life satisfaction (Bronk, Hill, Lapsley, Talib & Finch, 2009) and with daily happiness, emotional stability (Kiang & Fuligni, 2010). Both the exploration and the fulfilment of the purpose are associated with greater life satisfaction in the case of young people and emerging adults (Bronk et al. 2009). Sumner et al. (2015) found a significant relationship between the exploration of the purpose and the negative affect, as well as between the fulfilment of the purpose and the positive affect. The study carried out on 850 emerging adults shows that the exploration of the purpose is predictive of greater negative affect and a lower degree of life satisfaction, while the fulfilment of the purpose is predictive of life satisfaction and positive affect.

As for the relationship between purpose and identity, theoretical and empirical works agreed on the strong association of the two notions (Bronk, 2011; Hill & Burow, 2012; Sumner et al., 2015). For example, research on teenagers has shown that the development of identity consolidates the fulfilment of a purpose in life and that purpose helped those teenagers understand what they did and how they fit into a larger context (Bronk, 2011). Burrow and Hill (2011) examined the mediating role that purpose has in the relationship "identity – well-being" in the case of teenagers and emerging adults. The results showed that purpose commitment fully mediates the relationship "identity – changes" in daily positive and negative affectivity. In general, findings suggest that establishing a purpose in life may be an important mechanism through which a stable identity contributes to well-being.

The considerable number of pieces of research on purpose in the Western culture led to a relatively large number of purpose measurements. For a broader perspective on the phenomenon and of the instruments used see Bronk's study (2014) focused on the analysis of the purpose in life – *Purpose in Life* (especially the second chapter, *Measuring Purpose*). Most of these instruments are developed around Victor Frankl's conception (1959), according to whom mental disorders are caused by existential factors such as the lack of purpose. This is the foundation of the first survey of purpose in life: Frankl Questionnaire (13 items). Frankl set the model for other instruments developed later: the Purpose in Life Test (Crumbaugh & Maholick, 1964), the Existence Subscale of Purpose in Life Test - EPIL (Law, 2012), the Life Purpose Questionnaire - LPQ (Hablas & Hutzell, 1982; Hutzell, 1989), Seeking of Noetic Goals Test (SONG, Crumbaugh, 1977), and Life Attitude Profile-Revised - LAP-R (Reker, 1992).

One of the most recent instruments founded on Frankl's theory is the *Revised Youth Purpose Survey* (RYPS – Bundick, Andrews, Jones, Mariano, Bronk, & Damon, 2006), whose objective is the assessment of both the identification of the purpose and of the search for a purpose in the case of the teenagers and emerging adults. The survey was first called the Youth Purpose Scale, it had 20 items (Bundick et al, 2006), and it was constructed by borrowing items from related measures of purpose (Ryff Scales of Psychological Well-being – Ryff & Keyes, 1995) and meaning in life (Meaning in Life Questionnaire – Steger, Frazier, Oishi & Kaler, 2006). This survey was structured around two subscales: the Identified Purpose Subscale (15 items) and the Searching for Purpose Subscale (5 items). Bronk et al. (2009) report a Cronbach's alpha of .94 for each subscale.

As provided by Stanford Center on Adolescence Youth Purpose Project, RYPS is made of two subscales: the Purpose Exploration Subscale – PE (4 items; example: *I am always looking to find my life's purpose;* α = .79 and for 6th graders, α = .75[2]); and the Purpose Commitment Subscale - PC (6 items; item example*: I have a purpose in my life that reflects who I am;* α = .85 and for the 6th graders, α = .80). All the items on the scale are measured from 1 (*strongly disagree*) to 7 (*strongly agree*). Sections 2 (The categories of identified purpose scale), 3 (Life goals scale), and 4 (Activity involvement scale), established by Stanford Center on Adolescence Youth Purpose Project are used only if the respondents showed a strong sense of purpose for the scale Purpose Commitment, and if one wishes to continue to identify purposes, as they have the role to provide more information on how respondents find their purpose in life.

To the best of our knowledge the actual studies of RYPS validation are very few although the instrument was used in many studies in association with moral identity (Hardy, Walker, Olsen, Woodbury, &

[2] indices provided by Stanford Center on Adolescence Youth Purpose Project

Hickman, 2014), hope and life satisfaction (Bronk et al., 2009), well-being (Hill, Burrow, Brandenberger, Lapsley, & Quaranto 2010), identity and subjective well-being (Sumner et al., 2015), self-esteem, and the parents-children relationship (Blattner, Liang, Lund, & Spencer, 2013), voluntary service activity engagement (Han, Kim, Jeong, & Cohen, 2017), civic engagement, and prosocial tendencies (Douglas, 2015).

Given the absence of resources and instruments necessary for the evaluation of the purpose in an educational context, we proposed the examination of the psychometric properties of the Revised Youth Purpose Survey – RYPS on a sample of Romanian subjects, by using the short form of RYPS with 10 items. The method used for translation of the RYPS was forward translation, from English in Romanian and next in the English language. Both versions did not differ noticeably.

2. Method

2.1. Participants and procedure: The psychometric data from this paper comes from processing the answers of a number of 500 undergraduates (257 male and 243 females) ($\bar{X}age$ = 19,02; S.D. = 1,38) from one large technical public university. The students were randomly selected from the years of study I and II. Data collection for the study took place in academic years 2016/2017 and 2017/2018. Participants provided informed consent and completed the measures voluntarily and anonymously. The measures were administered in groups and each administration was completed in about 20 minutes. The study subjects were not rewarded for participating in the study.

2.2. Data Collection Instruments

The data of the study were collected through Revised Youth Purpose Survey – RYPS, Scale of Positive and Negative Experience – SPANE, Satisfaction with Life Scale – SWLS, Short psychological well-being scale – SPWB and Aspects of Identity Questionnaire – AIQ-IV.

2.2.1. Scale of Positive and Negative Experience – SPANE (Diener et al., 2009) assess a broad range of pleasant and unpleasant feelings by asking people to report their feelings in terms of their duration after recalling their activities and experiences during the previous 4 weeks. The SPANE consists of 12 items: six items assess positive feelings (SPANE-P), and the other six assess negative feelings (SPANE-N) on a scale from 1 – *very rarely or never* to 5 – *very often or always*. Finally, affect balance is also calculated (SPANE-B): the negative feelings score is subtracted from the positive feelings score. The studies have reported optimal validity of the scale in the case of 21 322 full-time workers (Li, Bai & Wang, 2013). In the present study, Cronbach's alpha indices were .85 (SPANE-P) and 83 (SPANE-N).

2.2.2. Satisfaction with Life Scale – SWLS (Diener, Emmons, Larsen, & Griffin, 1985) takes into account the cognitive assessment of life satisfaction. The SWLS is a short 5-item instrument designed to measure global cognitive judgments of satisfaction with one's life. The SWLS is a 7-point Likert style response scale. Sample item: *In most ways, my life is close to my ideal.* Test-retest reliabilities have ranged from .83 (2 weeks) to .54 (4 years), and coefficients alpha have ranged from .79 to .89 (Pavot & Diener 1993; Pavot, Diener, Colvin, & Sandvik, 1991). Regarding Cronbach's alpha, similar findings were observed on the Romanian students, α = .82, (Cazan, 2014). The scale also showed high internal consistency in the present study (α = .80). The validations of the scale were made, in most cases, in correlation with the instruments that measure hope (Bayley, & Snyder, 2007; Galanakis, Lakioti, Pezirkianidis, Karakasidou, & Stalikas, 2017), meaning in life (Steger, Frazier, Oishi, & Kaler, 2006], happiness, (Caycho-Rodríguez, et al. 2018; Galanakis et al., 2017), perceived health and social support (López-Ortega, Torres-Castro, & Rosas-Carrasco, 2016) etc.

2.2.3. Short psychological well-being scale – SPWB (Ryff & Singer, 1998) is a self-report inventory with 18 items grouped into six subscales: Autonomy ("I believe in my own opinions even if they differ from others'); Environmental control ("I manage my day-to-day responsibilities well"); Personal growth ("For me, life was a continuous learning, growth, and development process"); Positive relationship with the other people ("People describe me as a person who likes spending time with others"); Life purpose ("Some people wander aimlessly in their life, but I am not one of them") and Self-acceptance ("In general, I like most parts of my personality"). Every scale has 3 items (8 of them reverse) assessed on a scale from 1 – *strongly disagree* to 6 – *strongly agree*; α = .55 to .70 on adolescents). The scale has been validated in many cultural contexts

(Lin, 2015; Luştrea, Al Ghazi & Predescu, 2018; Villarosa & Ganotice, 2018). In the present investigation, Cronbach's alpha values ranged from .65 to .72.

2.2.4. Aspects-of-Identity Questionnaire – AIQ-IV (Cheek, Smith, & Tropp, 2002) measure identity orientations (45 items) on a scale from 1 – *Not important to my sense of who I am to* 5 – *Extremely important to my sense of who I am*. The identity orientations are divided into *Personal identity orientation* - our private beliefs about our psychological traits (10 items – e.g. "My personal values and moral standards"); *Relational identity orientation* - how we see ourselves in the context of our intimate relationships (10 items – e.g."My relationships with the people I feel close to"); Social identity orientation - how we see ourselves in more general interpersonal contexts (7 items – e.g. "My reputation, what others think of me"); *Collective identity orientation* - how we represent our various reference group identities (8 items – e.g. "My race or ethnic background"). 10 special items do not score. Personal and Relational identity are rather characterized as independent/individualistic and Social and Collective identity are at the opposite pole, characterized as interdependent/collectivistic. The Cronbach's alphas reported by authors are α = .72 to .92 (Cheek, & Briggs, 2013; Cheek, Smith & Tropp, 2002). In the present study, Cronbach's alpha values ranged from .69 to .82. AIQ-IV was validated by exploratory factor analysis, confirmatory factor analysis and test-retest (Yin, & Etilé, 2019).

2.3 Analysis strategies were conducted using SPSS 22 and Amos 20 to examine items and subscales properties, such as the confirmatory factorial analysis and invariance for gender, descriptive statistics, internal consistency, bivariate correlations with other validated measures.

3. Results and discussion

3.1. Factorial structure

Confirmatory factor analysis was used to test the hypothesis that the scale measured two constructs. Assessment of multivariate normality distribution was performed using Mardia's Multivariate Normality Test. Because the critical ratio of the Mardia's coefficient of multivariate kurtosis was greater than 1.96 (CR = 19,41), the sample can be considered multivariate non-normal. One means of managing non-normality is the distance criteria proposed by Mahalanobis. In order to normalize the distribution, one needs to identify and to eliminate the cases of outliers. But this can lead to the loss of the power of the model. Under these circumstances, we considered that one robust way of managing non-normality is bootstrap resampling.

Therefore, the method of Maximum Likelihood (ML) with bootstrapping was employed. To assess model fit, different indexes of fit were examined in confirmatory factor analysis (CFA): *chi-square value*, df, *GFI* (goodness-of-fit index), *AGFI* (adjusted goodness-of-fit index), *PGFI* (parsimony of goodness-of-fit index), *CFI* (comparative fit index), *RMSEA* (root mean squared error of approximation), *SRMR* (standardised root mean square residual).

Two models were tested, one with a single factor and the second with two factors. The latter turned out to be appropriate. For each and every factor we co-varied the items with the highest value of modification indices. For Purpose exploration scale we co-varied item e1 ("I am looking for something that makes my life meaningful") and item 3 ("I am seeking a purpose of a mission for my life"), and for Purpose commitment scale we co-varied item e5 ("I have discovered a satisfying life purpose") and item e6 ("I understand my life's meaning"), item e7 ("I participate in one or more organizations that serve my purpose in life") and e9 ("I have a purpose in my life that reflects who I am"), and in the end item e7 ("I participate in one or more organizations that serve my purpose in life") and e10 ("I have a life purpose that says a lot about the kind of person I am"). After each constraint of the co-variants, the values of the indicators mentioned above improved.

Table 1 shows the two-factor structure seems to be the best fitting model χ^2 = 78,371; df =30; χ^2/df = 2,62; *GFI* = .969; *AGFI* = .942; *PGFI* = .529; *CFI* = .895; *RMSEA* = .057 (90% Confidence Interval (CI); *SRMR* = .061; *p* = .001 than one factor model: χ^2 = 85,167; *df* = 22; χ^2/df = 3,87; *GFI* = .962; *AGFI* = .905; *PGFI* = .385; *CFI* = .847; *RMSEA* = .080 (90% Confidence Interval (CI); *SRMR* = .079; *p* = .001. All the standardized factor loadings of the RYPS were above .70 for Purpose exploration scale and over .45 for Purpose commitment scale (see figure 1).

Table 1. Confirmatory factor model

Model	χ^2	df	CMIN/df	GFI	AGFI	PGFI	CFI	RMSEA (CI 90%)	SRMR
Single factor	85,167	22	3,87	.962	.905	.385	.847	.080 (.062 - .098)	.079
Two factor	78,371	30	2,62	.969	.942	.529	.895	.057 (.047 - .080)	.061

3.2. Factorial invariance

With a view to analysing the factorial invariance, we studied the hierarchy of models with constraints for the gender-related criterion. Initially, the model was tested without constraints both for male and female subjects (model 1). Both RMSEA and CFI were adequate (table 2). A second model imposed constraints in factor loadings (model 2). The estimations of the model fit the data at an acceptable level. The third model (model 3)

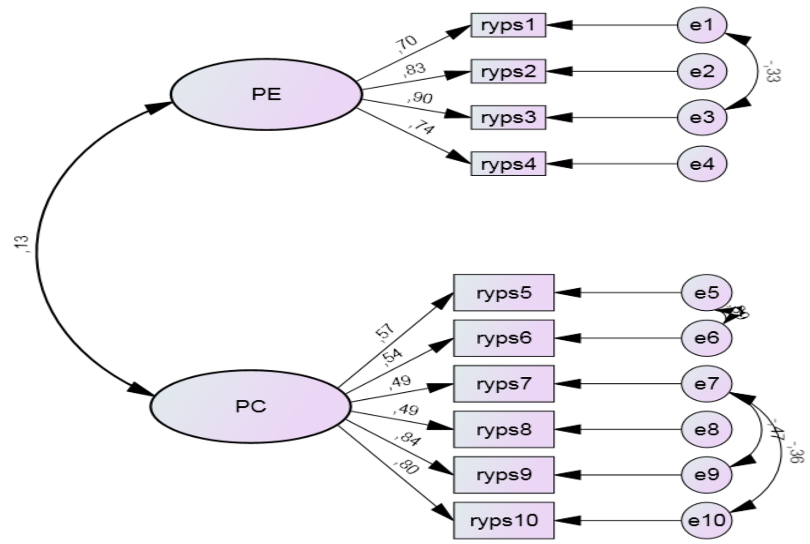

Figure 1 Confirmatory factorial analysis of the RYPS
PE – purpose exploration, PC – purpose commitment

tested the constraints imposed in covariances. Data provide a fit for this model. Thus, for the sample on which RYPS was tested psychometrically, the measurement model was invariant depending on the gender-related variables (ΔCFI = .001 and $\Delta\chi^2$ was not significant). The differences regarding other indexes of fit are nonexistent (RMSEA) or negligible (i.e. GFI, TLI).

Table 2. Factorial invariance across gender

Model	χ^2	df	CMIN/df	CFI	RMSEA (CI 90%)	Model comparison	p
Model 1 No constraints	125,643	60	2,09	.962	.049 (.037-.062)	-	-
Model2 Factor loading constrained	126,012	61	2,06	.963	.049 (.037-.061)	2 *vs*. 1 $\Delta\chi^2 = 0.36$ $\Delta df = 1$	.544
Model 3 Factor loading and covariance constrained	126,012	61	2,06	.963	.049 (.037-.061)	3 *vs*. 1 $\Delta\chi^2 = 0.36$ $\Delta df = 1$	.544

3.3. Descriptive statistics

Table 3 shows the descriptive statistics. Regarding the gender-related difference, there was only one distinction for the Purpose Exploration scale for which female subjects had higher scores than the male ones ($\bar{X}$ male = 21,22; S. D. = 5,42; $\bar{X}$ female = 23,16; S. D. = 4,65; t = -4,80; p = .000). Internal consistency was assessed using Cronbach's alpha. According to Hair, Black, Babin & Anderson (2014), the coefficient alpha obtained for the two scales, Purpose exploration: α = .87 and Purpose commitment: α = .77, show that the questionnaire is highly reliable.

For the sub-samples of males and females, respectively, the values of internal consistency were .84 and .88, respectively, for the Purpose Exploration scale and .77 and .78., respectively, for the scale Purpose Commitment. For the assemblies represented by the RYPS items which resulted after eliminating each item at a time, the values of coefficient α were: .73 – item 1; .72 – item 2; .72 – item 3; .71 – item 4; .72 – item 5; .73 – item 6; .76 – item 7; .72 – item 8; .71 – item 9; .70 – item 10.

Table 3. *Descriptive statistics*

	$\bar{X}$	S.D.	Skewness	Kurtosis
1. I am looking for something that makes my life feel meaningful	5,72	1,51	-1,19	.77
2. I am always looking to find my life's purpose	5,52	1,47	-.97	.39
3. I am seeking a purpose or mission for my life	5,45	1,47	-.89	.22
4. I am always searching for something that makes my life feel significant	5,32	1,48	-.77	-.00
5. I have discovered a satisfying life purpose	4,22	1,52	-.08	-.75
6. I understand my life's meaning	4,08	1,63	-.02	-.75
7. I participate in one or more organizations that serve my purpose in life	2,95	1,78	.65	-.56
8. I am always working toward accomplishing my most important goals in life	5,58	1,37	-.74	-.24
9. I have a purpose in my life that reflects who I am	5,07	1,63	-.68	-.35
10. I have a life purpose that says a lot about the kind of person I am	5,05	1,63	-.64	-.40
Purpose exploration score	5,51 α = .87	1,25	–	–
Purpose commitment score	4,49 α = .77	1,09	–	–

3.4. Convergent validity

Consistent with prior studies (Bronk et al., 2009; Sumner et al., 2015), Purpose Commitment scale correlates both with subjective well-being (life satisfaction – SWLS and the Positive Affect scale from SPANE), as well as with the total score of psychological well-being (all the scales in SPWB) and the four orientations of identity: personal, relational, social, and collective identity (AIQ-IV). The Purpose Exploration scale correlates with the negative affect (SPANE), the Personal Growth subscale (SPWB) and two of the orientations of identity - personal, and relational identity (AIQ-IV).

As the correlations with instruments mentioned show (table 4), the individuals who declare they fulfil their purpose live subjective well-being (positive affect – $r = .22$; $p < .01$; life satisfaction – $r = 47$; $p < .01$) and psychological well-being at a high level (total score PWB – $r = 47$; $p < .01$) and it seems that identity is constructed in a bipolar manner, both individually (personal identity – $r = .21$; $p < .01$; relational identity – $r = .15$; $p < .05$) and socially (social identity - $r = .21$; $p < .01$; collective identity – $r = .37$; $p < .01$). The students engaged in the exploration of the purpose live negative affectivity ($r = .15$; $p < .05$), they need personal growth, and they are rather idiocentric (personal identity – $r = .15$; $p < .05$; relational identity – ($r = .15$; $p < .05$). There is a weak, still significant correlation between Purpose Exploration and Purpose Commitment ($r = .13$; $p = 0.05$).

Table 4. RYPS bivariate correlations with validated measures

	Variables	Purpose exploration	Purpose commitment
SPANE	Positive affect	.04	.22**
	Negative affect	.15*	-.12
SWLS	Life satisfaction	.01	.47**
	Autonomy	.00	.28**
SPWB	Control	.19	.25**
	Personal growth	.20**	.22**
	Relationships	.03	.26**
	Life purpose	-.04	.15*
	Self-acceptance	.02	.43**
	Total SPWB	.07	.47**
AIQ-IV	Personal identity	.32**	.21**
	Relational identity	.19**	.15*
	Social identity	.06	.21**
	Collective identity	.13	.37**

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

4. Conclusions

The research aimed at investigating the psychometric properties of RYPS in the case of a group of students who need to develop resources and instruments available to the psychology of purpose in the educational context. On the whole, the evidence indicates that RYPS has acceptable psychometric properties. RYPS has two distinct sub-scales in its composition: Purpose Exploration Subscale that shows the extent to which the individual is exploring his purpose and the Purpose commitment showing the extent to which the individual has achieved his purpose. CFA show that the two-factor model is appropriate and it has acceptable coefficients. This study confirmed the original structure of the instrument. The obtained standardized factor loadings are over .70 for the Purpose Exploration subscale and over .45 for the Purpose Commitment subscale.

Psychometric characteristics were analyzed by means of consistency values, of the factorial structure, and by testing the relationship with other variables. Furthermore, the internal consistency was good, namely .87 and .77 (total sample), .78 and .88 (female subjects) and .77 and .84 (male subjects), which shows that RYPS is a valid instrument for the measurement of purpose in the case of emerging adults. In the present study, we provide evidence in support of the convergent validity by investigating the relationship between RYPS and other measures such as those for the subjective and the psychological well-being, and identity orientations. In these conditions, RYPS show good convergence validity.

Like any other study, the present one has its limitations. One of them is the sample of students obtained from only one university. In the present study, the model obtained for RYPS is adequate, on condition that we allow a correlation between the errors of the variance of some items (i.e. "I participate in one or more organizations that serve my purpose in life"). This suggests that there could be factors that could explain the difference of variance errors between the items. Taken together, results suggest that the RYPS represents a promising measure of the adolescents' and emerging adults' purpose in life. Our findings provide evidence of the applicability of the RYPS in the Romanian context especially in the case of the young population. That is why it is important to continue evaluating of the instrument on other age groups, especially adolescents. Since RYPS contains items of meaning in life, borrowed from the Meaning in Life Questionnaire – ML-Q (Steger et al., 2006), it is important to investigate when individuals develop a sense of purpose in life and which environments support this development. Clearly, it is important to explore the properties of RYPS in association with other aspects of wellness.

Considering the results of this study, we highlight the importance of other validation forms, of external validity, in particular, as well as the application of the measure to the general population as compared to its application to the specific population.

Acknowledgment

"This research used, with permission, the *Revised youth purpose survey* (Bundick, Andrews, Jones, Mariano, Bronk, & Damon, 2006) from the Stanford Center on Adolescence Youth Purpose Project, funded in part by the John Templeton Foundation and the Thrive Foundation for Youth."

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International Journal of Psychology and Educational Studies, 2019, 6 (2), 26-34

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International Journal of Psychology and Educational Studies

Smartphone Addiction and Leisure Constraints: College Students

Fikret SOYER

Faculty of Sport Sciences, Sakarya University of Applied Sciences, Sakarya, Turkey

ARTICLE INFO

Article History:
Received 16.05.2019
Received in revised form 20.05.2019
Accepted 22.05.2019
Available online 26.05.2019

ABSTRACT

The aim of this study was to investigate the leisure constraints perceived by the university students according to the level of smartphone addiction. In the study, in order to determine the constraints faced by the participants Leisure Constraints Scale developed by Alexandris and Carroll (1997), adapted to Turkish by Gürbüz, Öncü, and Emir (2012) and in order to determine the level of smartphone addiction, Smartphone Addiction Scale developed by Kwon et al. (2013) and adapted to Turkish by Noyan et al. (2015), was used. Conventional sampling method was preferred for sample selection and face-to-face survey method was used for data collection. In the analysis of the obtained data, descriptive statistics, Independent Sample t-test, One-way ANOVA, Chi-square, Hierarchical and non-hierarchical clustering analysis were used. A total of 1298 volunteers participated in the study: 676 males (52.1%) and 622 females (47.9%). According to the results of the study, it was determined that there was a statistically significant difference in the subscales of leisure constraints in terms of individual psychology, lack of knowledge, lack of friends, lack of time and interest according to smartphone addiction levels. As a result; It was determined that the high-level smartphones addicted students perceived a high level of leisure constraints than the university students who had a low level of addictions.

Keywords:
Leisure, Leisure Constraints, Smartphone Addiction

1. Introduction

Time is an abstract concept and a process that the events follow each other from the past to the future and continues uninterruptedly beyond the control of the individual (Akatay, 2006). Leisure is defined as the period of time that the individual is free from all constraints for himself and others (Howe & Carpenter, 1985; Kemp & Pearson, 1997). It is also a time period that remaining from working, sleeping, eating and other compulsory jobs, inspiring a sense of happiness (Ayhan, Eskiler & Soyer, 2017; Mieczkowski, 1990). When the concept of leisure was discussed in the historical process; In ancient Greece, it was considered as a class right as the time period dealing with the superior values of the world such as knowledge and truth; In the Roman period, it was considered as a renewal tool associated with working time. In the middle ages, the area of social representation and freedom of choice has evolved into a show, luxury and waste in the late middle ages.

Excessive production, prosperity level developments and a decrease in working hours together with mechanization started with industrial revolution caused the increase in leisure of individuals (Karaküçük, 2005). However, in the first years of industrialization, instead of evaluating leisure efficiently, work has been highlighted. Lafargue argued that individuals should create leisure and evaluate this time by resting and having fun, opposing excessive work in long-term and inappropriate conditions (Lafargue, 1999). Today, the concept of leisure, which is evaluated more efficiently, has become the focus of the lives of many people. (Kurar & Baltacı, 2014). However, the increase in leisure and technological developments does not mean that leisure can be used effectively for all individuals in society.

[1] Corresponding author's address: Faculty of Sport Sciences, Sakarya University of Applied Sciences, Sakarya, Turkey
Telephone: +90 532 547 89 87
Fax: +90 264 616 00 14
e-mail: fikretsoyer@gmail.com
http://dx.doi.org/10.17220/ijpes.2019.02.003

Individuals face some constraints in terms of efficient using of leisure due to various reasons. Factors that prevent an individual from participating in leisure activities, reduce the number of repetitions, break the desire

to participate, and eliminate the advantage of activity services are defined as leisure constraints (Jackson, 1993; Jackson and Henderson, 1995). In the related literature, the concept of the constraints is divided into different classes. According to Francken and Van Raiij (1981) there are two types of constraints as an external and internal. The time, money, geographical distance and lack of facilities were considered as an external constraints, while personal capacities, abilities, knowledge, and interests were suggested as an internal. The leisure constraints were categorized into seven subscales by Tai (2001). They are environment condition, limited oneself, individual psychology, work, family, economical, and confidential aspects. Crawford and Godbey (1987) divided the leisure constraints into three classes: personal, interpersonal and structural constraints. Personal constraints include individual psychology, lack of knowledge, and lack of interest; lack of friends in interpersonal constraints; structural constraints represent structural and time.

The use of digital media through the use of computers, mobile phones and tablets (İlhan, 2008), which are now emerging with technological means, constitutes a major constraint in evaluating the leisure time of individuals (Hodge et al., 2012). Until recently, mobile phones providing just communication, have now been replaced by smartphones. Although smartphones offer many conveniences to our daily lives, they have also negative effects on the physical and spiritual health of people and in their relationships. The excessive use of smartphones reveals the concept of 'addiction' (Park & Lee, 2012). In the literature, it has been concluded that excessive use of smartphones leads to problematic behaviors of individuals (Palen, Salzman and Youngs, 2001; Paragras, 2005). Increasing functionality of smartphones has become a tool of dependence not only for interpersonal communication but also for other functions such as social media and digital games. Individuals have turned to smartphones instead of leisure activities as entertainment devices (Ekinci, Yalçın and Ayhan, 2019; Bian and Leung, 2014). Individuals who divide a large portion of their time into smartphones are likely to be unable to efficiently assess their leisure. In this context, in this study, the leisure constraints that university students perceive according to smartphone addiction levels were investigated.

2. Method

2.1. Research Model

In this study, one of the quantitative research methods, the screening model, was used. Data were collected by using the cross-sectional scanning model.

2.2.Participants

Sakarya University students comprised the research universe. Data were collected from 1298 students by using face-to-face survey method, determined by easy sampling method. Demographic features of the participants were given in Table 1.

Table 1. Demographic Characteristics

Variables		n	%
Gender	Male	676	52.1
	Female	622	47.9
Age	18	121	9.3
	19	234	18.0
	20	336	25.9
	21	254	19.6
	22	158	12.2
	23	88	6.7
	24	107	8.2
Class	1	309	23.8
	2	486	37.4
	3	302	23.3
	4	201	15.5
Daily Smartphone Control	Less than 10	108	8.3
	10-20 times	384	29.6

20-30 times	344	26.5
30-40 times	212	16.3
More than 40	50	19.3

2.3. Data Collection Tool

In the research, leisure constraints and smartphone addiction scales were used as data collection tools. Data were obtained by adding these scales into a single form by adding them to the demographic characteristics.

2.3.1. Leisure Constraints Scale

In the study, in order to determine the obstacles faced by the participants Leisure Constraints Scale developed by Alexandris and Carroll (1997), adapted to Turkish by Gürbüz and Karaküçük (2008) was used. The scale comprised of 18 items and 6 sub-scales. Sub-dimensions; (1) individual psychology, (2) lack of information, (3) facility, (4) lack of friends, (5) lack of time, and (6) lack of interest. Scale rating are in order from 4 to 1 in sequential form (very Important and absolutely Unimportant).

2.3.2. Smartphone Addiction Scale

In order to determine the level of smartphone use, one-dimension and ten items Smartphone Addiction Scale, developed by Kwon et al. (2013) and adapted to Turkish by Noyan et al. (2015), was used. Scale rating are in order from 6 to 1 (Strongly Agree and Strongly Disagree).

2.4. Data Analysis

In the analysis of the data, as well as descriptive analyzes the t-test, one-way variance and chi-square analyzes were used to analyze the differences between variables. In addition, Hierarchical and Non-Hierarchical Clustering analysis were used in order to group the participants according to smartphone dependency levels (Tabachnick and Fidell, 2015). In this study, the K-mean analysis used in the Non-Hierarchical Cluster analysis (in determining the number of clusters) and in the Hierarchical Cluster analysis the Ward cluster algorithm method was used. This method was used to identify the groups when the researcher does not already know the number of groups and then to analyze the group membership (Çoluk, Şekercioğlu & Büyüköztürk, 2014; Nakip, 2006).

Table 2. Research Variables Descriptive Statistics

Variables	Cronbach α	Mean	Sd.	Skewness	Kurtosis
Smartphone addiction	.875	31.19	10.36	.273	-.557
Individual psychology	.683	2.65	.67	-.306	-.121
Lack of information	.783	2.74	.73	-.447	-.136
Facility	.745	2.92	.69	-.529	.092
Lack of friends	.759	2.45	.72	-.089	-.388
Time	.537	2.75	.60	-.523	.283
Lack of interest	.638	2.61	.69	-.325	-.163

In addition to the mean and standard deviation values of the research variables, the variables were evaluated by considering the skewness and kurtosis values of the data if they had a normal distribution. The findings showed that the data were close to normal distribution and parametric analyzes could be applied. On the other hand, when the internal consistency coefficients of the variables were examined, it was determined that Cronbach α values ranged from .875 to .377 (Altunışık, Coşkun, Bayraktaroğlu & Yıldırım, 2012; Büyüköztürk, 2016).

3. Results

Firstly, the sample was divided into groups based on the levels of smartphones addiction. To classify the students participating in the research; Hierarchical Clustering Analysis was performed and it was seen that the consumers could be classified in two clusters with the help of aggregation table and tree graphic. Then by using the 'Range of solutions' command the participants' clusters were determined (Nakip, 2006). In this context, as it was observed that there were irregular deviations in the cluster distribution when the number of clusters were increased and / or decreased, so, it was decided that the number of ideal clusters was two. Finally, Non-Hierarchical Clustering Analysis was performed to determine the final cluster memberships. Table 3 shows the number of persons and the size of clusters.

Table 3. The Distances between Cluster Sizes and Cluster Centers

Clusters	Number of persons	Size of Cluster (%)	Distances Between Cluster Centers	
			Cluster 1	Cluster 2
Cluster 1	695	53.5		17.213
Cluster 2	603	46.5	17.213	
Total	1298	100		

According to Table 3, there were 695 (53.5%) participants in the first cluster and 603 (46.5%) participants in the second cluster. The distance between these cluster centers is 17.213. In addition, it was determined that the difference between the variables, as a result of the one-way analysis of variance in the analysis, was significant at the level of 0.01. According to the results of clustering analysis, two different groups with low and high addiction levels were determined.

Table 4. The comparison of the Smartphone addiction level and usage time

			Daily Smartphone Usage Time					X^2	Sd.	p
			1-2 hours	2-3 hours	3-4 hours	5-6 hours	6 <hours			
Smartphone Addiction Level	Low	n	194	169	129	80	123	98.025	4	.001
		%	70.8	65.3	55.4	38.3	38.1			
	High	n	80	90	104	129	200			
		%	29.2%	34.7	44.6	61.7	61.9			
	Total	n	274	259	233	209	323			
		%	%	100.0	100.0	100.0	100.0			

It was seen that the groups of participants determined differ depending on the average daily use of smartphones. It was observed that a significant majority of participants with high level of smartphone addiction use the phone for an average of 5 hours and more per day.

Table 5. Gender related difference analysis

Variables	Gender	Mean	Sd.	t	p
Individual Psychology	Male	2.61	.68	-2.212	.027
	Female	2.69	.66		
Lack of Information	Male	2.71	.74	-1.851	.064
	Female	2.78	.72		
Facility	Male	2.96	.70	1.880	.060
	Female	2.89	.70		
Lack of Friends	Male	2.42	.68	-1.560	.119
	Female	2.48	.76		
Time	Male	2.74	.61	-.438	.661
	Female	2.75	.60		
Lack of Interest	Male	2.62	.68	.605	.545
	Female	2.60	.71		

As seen in Table 5; in terms of perceived leisure constraints, the significant differences were determined between males and females in the sub-dimension of individual psychology ($p < .05$). It was revealed that women have higher score than men in the dimension of individual psychology. This result shows that the female participants perceive individual psychology constraint more than males in terms of perceived leisure constraits.

Table 6. According to Smartphone Addiction the Difference Analysis

Variables	Smartphone Addiction	Mean	Sd.	t	p
Individual Psychology	Low	2.58	.68	-3.863	.001
	High	2.72	.65		
Lack of Information	Low	2.68	.76	-3.193	.001
	High	2.81	.69		
Facility	Low	2.93	.72	.154	.878
	High	2.92	.66		
Lack of Friends	Low	2.36	.74	-4.703	.001
	High	2.55	.69		
Time	Low	2.70	.63	-2.839	.005
	High	2.80	.57		
Lack of Interest	Low	2.54	.72	-4.195	.001
	High	2.70	.65		

When the leisure constraints perceived by the participants in terms of smartphone addiction levels were evaluated, in the individual psychology (t = -3.863), lack of knowledge (t = -3.193), lack of friends (t = -4.703), lack of time (t = -2.839) and in lack of interest sub-dimensions (t = -4.195) the statistically significant differences were determined (p <.01). On the other hand, it was determined that there was no significant difference in the facility sub-dimension according to smartphone addiction level (p> .05). Among the participants in the research, it was determined that the individuals with higher levels of smartphone addiction perceived the sub dimensions of the individual psychology, lack of knowledge, lack of friends, lack of time, and lack of interest as the leisure constraint higher than the students with low smartphone addiction.

Table 7. Age-related difference analysis

Variables		Sum of Squares	df	Mean Square	F	p	Difference
Individual Psychology	Between Groups	7.143	6	1.191	2.674	.014	18-20, 21, 22, 23; 19-23
	Within Groups	574.433	1290	.445			
Lack of Information	Between Groups	7.017	6	1.170	2.205	.040	18-20, 21, 22; 19-22
	Within Groups	684.136	1290	.530			
Facility	Between Groups	6.540	6	1.090	2.273	.035	18-19, 22; 20-22; 22-24
	Within Groups	618.461	1290	.479			
Lack of Friends	Between Groups	8.183	6	1.364	2.639	.015	18-20, 23; 19-20; 20-21, 23; 21-22
	Within Groups	666.580	1290	.517			
Time	Between Groups	6.092	6	1.015	2.828	.010	18-20, 21, 22, 23; 19-21, 22, 23
	Within Groups	463.121	1290	.359			
Lack of Interest	Between Groups	2.774	6	.462	.968	.445	-

Within Groups	615.895	1290	.477

According to Table 7 it was determined that there was no statistically significant difference in the lack of interest subscale of leisure barriers according to age ($p > .05$). On the other hand, it was determined that there were statistically significant differences according to age in individual psychology, lack of knowledge, facility, lack of friends and time subscales of leisure barriers scale ($p < .05$). When the results related to the individual psychology were examined, statistically significant difference was determined between the individual psychology scores of individuals aged 18 and 21, 22, 23 also, between the individuals of the age group of 19 – 23. When the findings related to the lack of knowledge were examined, statistically significant difference was determined between the individuals aged 18 and 21, 22, 23 also, between the individuals of the age group of 19 – 23. When the findings related to the facility sub-dimension were examined, statistically significant difference was determined between the mean scores of the individuals aged 18 and 19, 22 also, between the individuals aged 22 – 20, 24. When the findings related to the lack of friends were examined, statistically significant difference was determined between the mean scores of the individuals aged 18 and 20, 23; between 19 – 20; 20-21, 23 and between 21-22 age groups. In addition, when the findings of time sub-dimension were examined, statistically significant difference was determined between the time scores averages of 18-year-olds and 20, 21, 22 and 23-year-olds, and time averages of 19-year-olds and the mean scores of individuals at the age of 21, 22, and 23 years.

4. Discussion and Conclusion

Time management is very important for users who use tools such as smartphones. Misuse and overuse of the smartphones cause negative consequences such as addiction (Balta and Horzum, 2008). Individuals, especially the new generation, act as dependent on technological tools for leisure assessment (Strasburger, Wilson and Jordan, 2009). Although these devices are a technological tool that makes life easier for individuals, they may cause negative effects on individuals in some aspects. Individuals who spend most of their time with smartphones are likely to encounter some obstacles in their leisure time. In this direction, the main purpose of this study was to investigate the leisure barriers perceived by the university students according to the level of smartphone addiction.

As a result of the research, it was determined that the individuals with a high level ofs smart phone addiction had a higher perceptions of barriers in terms of individual psychology, lack of knowledge, lack of friends, lack of time and interest. This result suggests that individuals with high levels of smartphone addiction face more barriers to leisure activities than individuals with low addiction levels. Individuals with a high level of addiction can cause problems in terms of time management. In the research, it is seen that the majority of individuals who have a high smart phone addiction spend more than 5 hours a day with smart phone. This situation may cause the concept of leisure not to be sufficient due to the long-term usage of smart phone and thus individuals encounter obstacles in participation to the leisure activities. In a study by Thulin and Vilhelmson (2007) on young individuals in Germany, it was concluded that smartphones changed the individual planning and timing structures. This finding is consistent with this study. In addition, although it is not a direct smartphone there is a positive correlation between addiction level and duration of internet usage and digital gaming addiction, which are among the other types of technology addiction (Balta and Horzum, 2008; Çakır, Ayas & Horzum, 2011). The increase in the use of technology is based on focusing on the tool that forms the basis of addiction, rather than on other jobs or leisure activities. This will be the case in the smartphone.

As the level of smartphone addiction increases, the increase in the number of leisure barriers is a situation that can be explained by the criteria of technology dependence in the literature. According to Griffiths, as the level of addiction increases, the attention, tolerance, conflict and relapse of the vehicle that the individual is dependent on increases (Horzum, Güngören and Kaymak, 2018). When these four features are taken into account in terms of smartphones, smart phones attract attention are the most important activities of life and dominate thoughts and behaviors. In this respect, it is possible to spend time with smartphones in leisure time. Tolerance is the continuation of smartphone usage time and loss of control over time. In this case, leisure activities may cause obstacles. Conflict is the ability of an individual to perceive leisure barriers in terms of interest and friend by entering into a clash with his close circle and himself by using a smart phone.

Recurrence can be explained as becoming an unhappy imagining the usage or waiting for the moment of using a smartphone when you do not use it. In this case, smartphone addiction is a crucial factor in perceiving the leisure barriers. Nowadays, both the scope of information and technological developments are moving at a great pace, and this is seen to cause changes in the society with the latest developments of the internet based intelligent tools (Kwon, 2013). Smartphones have changed the way people communicate with others, accessing to information, entertaining, and managing their daily lives (Park, Kim, Shon and Shim, 2013). In this respect, smart phone addiction is also associated with sleep quality, daily rhythm and personality structures (Demirhan, Randler & Horzum, 2016).

In the research findings, it was determined that there was a significant difference in the sub-dimension of the individual psychology of leisure barriers according to gender, and females in this sub-dimension faced more obstacles than males. Restrictions on women's participation in leisure activities have been seen since ancient times. As of childhood, leisure activities were directed towards boys and it was not appropriate for girls to participate in such activities. Some researches show that there are various gender differences and women face more barriers to participating in leisure activities than men. It is thought that females can get more obstacles than males as they cannot get enough support from their families, also the society's excessive pressure on women and little opportunities they are given caused them not to participate in leisure activities freely (Ayhan et al., 2018; Raymore, Godbey and Crawford, 1994; Hudson, 2000; Henderson, 1995). In the related literature, there are studies supporting this result (Alexandris and Carrol, 1997; Tolukan, 2010; Soyer et al., 2017).

In the findings of the study, it was determined that there was a significant difference in the sub-dimensions of individual psychology, lack of knowledge, facility, lack of friends and time The differences in the responsibilities, psychological status and income levels of can be shown as a reason for this situation. There are studies that support these results in the literature (Amin et al., 2011; Alexandris and Caroll, 1997; Ekinci, Kalkavan, Ustun and Gundüz, 2014).

As a result, it was determined that university students who were highly addicted to smartphones faced obstacles in participating leisure activities. In order to reduce addiction, parents should take measures to protect their children from an early age, awareness raising trainings by the relevant experts in educational institutions can be given, the artistic, sportive and cultural activities in universities can be increased and students should evaluate their energy in these areas.

5. Limitations of the Study and Further Research

The research has some limitations. At the beginning of these limitations, there is a measurement of smart phone addiction by a scale. Measurements of mind waves, biological other measurements (Randler, Horzum, & Vollmer, 2014) the measurements based on smartphone usage, time and data can be made in addiction measurements. In addition, studies were carried out with the students of Sakarya University. In order to obtain more generalizable data, similar or different studies can be performed by collecting data from students of different universities. In the study, the data of smartphone addiction was taken as a discontinuous variable. In future studies, structural equation modeling can be performed with continuous data. In this model studies, smart phone addiction can be examined with biological, psychological, and demographic individual differences.

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International Journal of Psychology and Educational Studies, 2019, 6(2), 35-50

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International Journal of Psychology and Educational Studies

Facebook Usage and Depression Levels of Selected Filipino College Students

Grace Pauline A. Maglunog[1] and Marıson Felicidad R. Dy[2]

Department of Human and Family Development Studies
College of Human Ecology
University of the Philippines Los Baños
Philippines

ARTICLE INFO

Article History:
Received 29.11.2018
Received in revised form 10.05.2019
Accepted 15.05.2019
Available online 26.05.2019

ABSTRACT

This study examined the relationship of sociodemographic characteristics and Facebook usage to the depression level of college students. A total of 347 respondents were purposively selected and completed a self-administered questionnaire. Results showed that: sex has a weak positive association with depression level (r=0.0962); age did not vary much across depression level; there is a moderate positive association between sexual orientation and depression level (r= 0.2794); socioeconomic status has an inverse relationship with depression level (r= -0.2126); and relationship status has a moderate positive association with depression level (r= 1.365). Further, there is a moderate positive association between the number of minutes spent on Facebook and depression level (r= 0.4229); there is a weak positive association between frequency of Facebook visits and depression level (r= 0.3052); and Facebook activities are positively correlated to depression. Young social media users are encouraged to use it moderately to avoid negative mental health outcomes.

Keywords:
Facebook usage, depression, adolescents, college students

1. Introduction

There is an estimated 350 million people suffering from depression worldwide (World Health Organization [WHO], 2016). Depression is the current leading cause of disability and likely to be the second leading cause of death across the globe by 2020 (WHO, 2018). It is a common but serious mood disorder manifested by the lack of interest in common things and experiences, low mood, and mixed emotional, cognitive, physical and behavioural symptoms (National Collaborating Centre for Mental Health, 2010).

Several studies have shown that there is a difference in the prevalence of depression between males and females (Galambos, Leadbeater, & Barker, 2004). Most studies point to hormonal difference as the major explanation. Women experience more hormonal fluctuations which is believed to be associated with depressive symptoms. Women are also more likely to suffer from hypothyroidism, known to be associated with depression (American Institute of Stress, 2016). Further, women tend to be more involved in interpersonal relationships than men, making them more vulnerable to stress and depressive symptoms.

Various studies reported that the prevalence of depression differs among age groups. Community surveys have shown that elder people have higher clinical depression compared with younger ones due to the occurrence of physical disorders caused by aging. Thus, the boundaries of depression become unclear because it is usually confused with symptoms of physical disorders (Drayer, Mulsant, Lenze, Rollman, , Dew

[2]Corresponding author's address: Dept of Human and Family Development Studies, College of Human Ecology, UP Los Banos, Laguna, Philippines
Telephone: +63-049-536-2480
Fax: +63-049-536-2480
e-mail: mdy@up.edu.ph
http://dx.doi.org/10.17220/ijpes.2019.02.004

et al., 2005). Adolescents are more susceptible to mental health disorders compared to other age groups because of the transitions they experience (Child Trends Databank, 2015). Burt and Masten (2010) point to the neurobiological brain changes during adolescence which make adolescents more sensitive to environmental changes. These result to problems in emotional and behavioural regulation. Emerging social roles may be another factor. Struggles arise as they seek independence in their academic, career, and personal life decisions.

The prevalence of depression may also differ due to sexual orientation (American Psychological Association (APA, 2008). Several reports showed that LGBT (lesbian, gay, bisexual, transgender) people have higher depression rates compared to heterosexuals (Kerr, 2016). The negative attitudes (e.g. bullying, teasing, harassment) directed toward the LGBT community lead to increased risks for mental health problems (Center for Disease Control and Prevention, 2014). Depression can cause them to suffer and function poorly at work, school, and in the family and at its worst, depression can lead to suicide (WHO, 2016).

One significant environmental risk factor related to depression is one's socioeconomic status (Jokela & Järvinen, 2011). Unemployment, poverty, and housing unaffordability were correlated to the risk of mental illness (Hudson, 2005). Life in the lower socioeconomic status is more stressful and may lead to depression (Eaton, Muntaner, Bovasso, & Smith, 2001; Jokela & Järvinen, 2011).

There is a direct relationship between romantic involvement and depressive symptoms (Compian, Gowen, & Hayward, 2004). Depressive symptoms seem to be connected to the negative qualities of romantic relationships, relational aggression (Greca & Harrison, 2005), and levels of romantic competence (Davila, Steinberg, Miller, Stroud, Starr, & Yoneda, 2009).

According to the Pew Research Center (2016), 89% of adults (aged 18-29) use social networking sites (SNS) for social interactions, information seeking and sharing, for entertainment, relaxation, expression of opinions, communication, business deals, and surveillance about others (Whiting & Williams, 2013). The most popular social networking site worldwide, based on the number of active accounts, is Facebook (Statista, 2016). People use Facebook because it satisfies the needs for belongingness, self-presentation (Nadkarni & Hofmann, 2012), self-worth and self-integrity (Toma & Hancock, 2013), and is advantageous in increasing connectivity and on-line learning (Pantic, 2014). According to Jelenchick, Eickhoff & Moreno (2013) and Datu, Valdez, & Datu (2012), there is no relationship between SNS and depression. However, Labrague (20140 and Lin et al. (2016) present the association of social media usage with increased depression. The more time young adults use social media, the more likely they are to be depressed. Also, users who allot the highest amount of time in social media showed decreased social bonding and increased loneliness (Theobald, 2014). Engagement in some activities on social media may give a feeling of wasted time which negatively influences mood. Excessive use of social media may lead to depression because the exposure to highly idealized representations of peers elicits feelings of envy and a distorted belief that others have happier and more successful lives (Lin et al., 2016). Lastly, it may increase the risk of exposure to cyber-bullying or other negative interactions, which can cause feelings of depression (University of Pittsburgh School of the Health Sciences 2016).

However, there is no research that specifically addresses the association of social media, particularly Facebook, and depression while considering the age, sex, sexual orientation, socioeconomic status, and relationship status of Filipino users. This study can increase consciousness regarding the relationship of Facebook usage and depression and the need to educate young social media users on its possible mental health outcomes. The research objectives were to:

1. Identify the sociodemographic characteristics of the college students
2. Determine the Facebook usage (e.g. number of minutes spent/day, frequency of visit, and frequency of performing the Facebook activities) of the college students
3. Determine the depression level of the college students
4. Determine the emotions felt by college students after engaging in Facebook
5. Determine the relationship of depression level of the college students to their sociodemographic characteristics and Facebook usage

2. Methods

This is a quantitative cross-sectional research which used the descriptive correlational design to explore the relationships between Facebook usage and depression levels. It was done at the University of the Philippines Los Baños in three sections of a General Education large class.

2.1.Participants

Purposive sampling for maximum heterogeneity was conducted to provide diverse responses in relation to the topic. A General Education (GE) class was selected due to the diverse composition of students coming from all the colleges and year levels. The GE class had three sections to which the questionnaires were given. There were 430 students enrolled in the three sections but only 347 participated, thus, a response rate of 80.70%. Their informed consent was obtained prior to data collection. Respondents accomplished the questionnaire in their respective residences or by electronic means.

2.2.Data Collection Instruments

A three-part questionnaire was used to gather data: the first part gathered the sociodemographic characteristics; the second part was about Facebook usage; and the third part was the depression scale. To determine the frequency of Facebook use, the modified questionnaire of Junco (2012) was used. Respondents were asked to estimate their time spent on Facebook, how often they checked their Facebook account, and how frequent they used the Facebook activities. Facebook activity items were coded using a five-point, positively anchored Likert scale ranging from Never to Very Frequently. The Cronbach alpha for this scale is 0.81 (Junco, 2012). They were also asked about their emotions after using Facebook. The Center for Epidemiological Studies-Depression (CES-D) was used to determine depression level. It is a 20-item self-administered questionnaire. Respondents were asked to rate how often they experienced symptoms associated with depression over the past week. Response options range from 0-3 for each item (0= Rarely/None of the time, 1= Some/little of the time, 2= Occasionally/Moderate amount of time, 3= All the time). The CES-D provided cutoff scores: 0-15: minimal depression; 16-26: mild depression; 27-60: major depression (Simoncic, 2012). Higher scores indicated greater depressive symptoms. The Cronbach alpha for the CES-D is 0.83 (Forteza and Torres, 2011).

2.3. Data Analysis

Tables and graphs were constructed to determine the respondents' profile and depression levels. Descriptive measures were computed for quantitative variables. To determine the relationship of depression level with qualitative characteristics, Cramer's V was used. To determine the relationship of depression level with quantitative characteristics, Spearman rank correlation analysis was done.

3. Results

3.1. Socio-demographic Characteristics

There were more female respondents (63%) than males (Table 1). The respondents' ages ranged from 17– 25 years old with a third aged 19 years old. Majority of the respondents were heterosexual (78.39%). More than half come from middle income families (61.38%) and majority were single (58.79%).

Table 1. Percentage Distribution of the Socio-demographic Characteristics of the Respondents

Socio-demographic characteristics	Frequency (f)	Percentage (%)
Sex		
Male	130	37
Female	217	63
Age		
17	33	9.51
18	94	27.09
19	119	34.29
20	62	17.87
21	24	6.92
22	10	2.89
23	3	0.86
24	1	0.29
25	1	0.29
Sexual orientation		
Attracted to the same sex	21	6.05
Attracted to the opposite sex	272	78.39
Attracted to both sexes	35	10.09
Attracted to all genders	12	3.46
Not attracted to any sex nor gender	3	0.86
Do not know to whom attracted to	4	1.15
Socioeconomic status		
₱7,890-15,780 (Low income)	81	23.34
₱15,780-118,350 (Middle income)	213	61.38
Above ₱118,350 (High income)	53	15.27
Relationship Status		
Single	204	58.79
Romantically involved	143	41.21

3.2. Facebook Usage of Respondents

The minimum amount of time spent in using Facebook was 10 minutes and the maximum amount was 900 minutes. The average number of minutes spent in using Facebook/day was 212.10 minutes. More than a quarter spent 250 minutes using Facebook (see Figure 1).

The minimum number of visits to Facebook/day was 1 and the maximum was 100. The average number of times they visit their Facebook account/day was 6.48. Nearly a quarter of the respondents visited Facebook 3 times a day.

Facebook was used very frequently for sending private messages/chatting (58.2%) and viewing videos (36%) while it was used somewhat frequently for commenting on statuses and pictures (32.6%) and sharing links (30.9%). Sometimes, it was used for posting photos (32%) and checking on someone (29.1%).

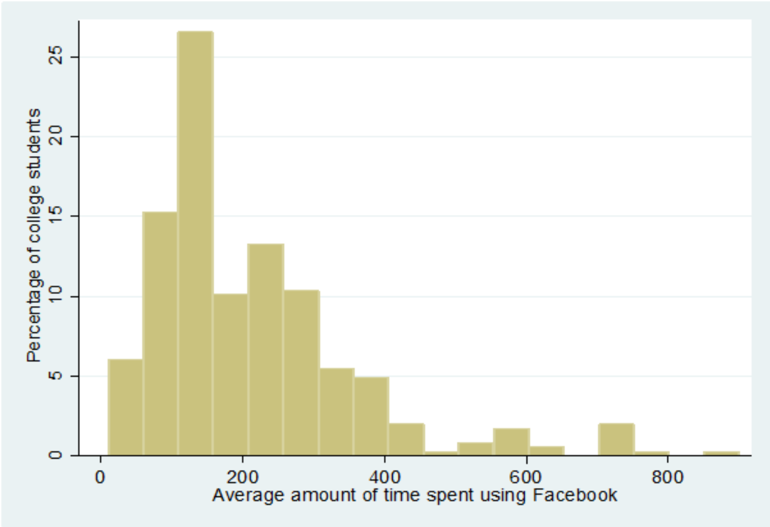

Figure 1. Average amount of time spent in using Facebook per day by the respondents

3.3. Depression Level of Respondents

Nearly half of the respondents (45.82%) had CES-D scores indicative of major depression (Table 2). The minimum observed score was 4 while the maximum was 57. The average CES-D score was 27, the lowest score in the range of the "major depression" classification. Results show that the respondents have higher depression levels as compared to the 245 undergraduate students (aged 18-23 years) in Simoncic's study (2012) where the average CES-D score was 17, within the range of the "mild depression", and only 12% have major depression.

Table 2. Percentage Distribution of Depression Levels of Respondents

Depression Level	Frequency	Percent
Minimal (0-15)	93	26.8
Mild (16-26)	95	27.38
Major (27-60)	159	45.82
Total	347	100

3.4. Relationship of Socio-demographics and Depression Level Respondents

3.4.1. Sex vs CES-D Scores

Respondents' sex category has a weak positive association with their depression level (r= 0.0962). Table 3 shows that there are more female students (47.22%) who experience mild and major depression levels than males (43.08%).

3.4.2. Age vs CES-D Scores

Respondents' age has a very weak negative association with their depression level (r= -0.0213). Based on mean scores, depression levels did not vary much across the ages, possibly due to their similar age group. The mean age for all depression levels was 19 years (Table 4).

Table 3. Depression level of respondents by sex

	Sex by %	
Depression Level	Male	Female
Minimal	32.3	23.61
Mild	24.62	29.17
Major	43.08	47.22
Total	100	10

Table 4. Depression level of respondents by age

Depression Level	Mean	Median	Sd	**Min**	**Max**
Minimal	**19.01**	19	1.37	17	23
Mild	**19.07**	19	1.21	17	22
Major	**19**	19	1.46	17	25

3.4.3. Sexual Orientation vs CES-D Scores

Sexual orientation has a moderate positive association with their depression level (r= 0.2794). Table 5 shows that those who are not heterosexual tend to have major depression (81.33%) as compared to the heterosexuals (36.03%).

Table 5. Depression level of respondents by sexual orientation

	Sexual orientation					
Depression level	1	2	3	4	5	6
Minimal	4.3	**93.55**	2.15	0	0	0
Mild	4.21	91.58	2.11	2.11	0	0
Major	**8.18**	61.64	**19.5**	**6.29**	**1.89**	**2.52**

(1= attracted to the same sex; 2=attracted to the opposite sex; 3= attracted to both sexes; 4= attracted to all genders; 5= not attracted to any sex nor gender; 6= does not know to whom he/she is attracted)

3.4.4. Socioeconomic Status vs CES-D Scores

Socioeconomic status (SES) has a moderate inverse relationship with their depression level (r= -0.2126). Those who have lower family incomes tend to have higher depression levels (65.43%) than those in the middle income (41.31%) and high income (33.96%) families (Table 6).

Table 6. Depression level of respondents by socioeconomic status

	Socioeconomic Status		
Depression level	1	2	3
Minimal	12.91	**66.66**	**28.65**
Mild	16.84	66.31	16.85
Major	**33.33**	55.35	11.32

(1= poor & lower income; 2= middle income; 3= upper middle income & rich)

3.4.5. Relationship Status vs CES-D Scores

Relationship status has a moderate positive association with their depression level (r= 0.1365). Table 7 shows that those who are romantically involved tend to have CES-D scores suggestive of major depression (51.75%) as compared to those who are single (41.67%).

Table 7. Depression level of respondents according to relationship status

	Relationship status	
Depression level	Single	Romantically involved
Minimal	56.99	43.01
Mild	**69.47**	30.53
Major	53.46	**46.54**

3.5. Relationship of Facebook Usage and Depression Level of Respondents

3.5.1. Number of minutes spent on Facebook vs CES-D Scores

There is a moderate positive association between the number of minutes spent on Facebook and depression level (r= 0.4229). As the number of minutes spent on Facebook increases, the depression level increases. Table 8 shows that those who were in the category of major depression spent an average of 274 minutes on Facebook/day compared to those in the minimal depression category (141 minutes).

Table 8. Depression level of respondents according to number of minutes spent on Facebook/day

Depression level	Obs	Mean	Median	Sd	Min	Max
Minimal	93	141.67	120	108.72	10	720
Mild	95	177.23	150	96.20	20	450
Major	159	**274.14**	240	171.84	15	900

3.5.2. Frequency of visit vs CES-D Scores

There is a weak positive association between the frequency of Facebook visits and depression level (r= 0.3052). The more frequent a student visits his/her Facebook account, the higher his/her depression level. Those who were in the category of major depression visited Facebook with an average of 8.58 visits/day compared to those in the minimal depression category with 4.14 visits (Table 9).

Table 9. Depression level of respondents according to frequency of Facebook visits/day

Depression level	Obs	Mean	Median	Sd	Min	Max
Minimal	92	4.14	3	2.96	1	20
Mild	94	5.28	5	3.84	1	20
Major	157	**8.58**	5	10.60	1	100

3.5.3. Frequency of Facebook Activities Usage vs CES-D scores

Depression level has positive correlations to all Facebook activities (Table 10). As frequency of usage of Facebook activities increases, their depression level also increases. Checking on someone has the highest correlation with depression level (r= 0.1903), followed by commenting (r= 0.1871), and viewing videos (r= 0.1716).

Table 10. Spearman Rank Correlation Coefficients for Facebook Activities and Depression Level

Facebook Activities	R
Checking what someone is up to	0.1903
Commenting	0.1871
Viewing videos	0.1716
Sharing links	0.1629
Sending private messages	0.156
Creating or RSVPing to events	0.1071
Posting videos	0.1015
Tagging videos	0.0863
Posting photos	0.0855
Posting status updates	0.0776
Tagging photos	0.058
Playing games	0.0543

3.5.4. Feelings after Facebook Usage

Facebook usage can cause both positive and negative feelings. Table 11 shows that feeling informed (79.25%), joyful (47.26%), and satisfied (40.92%) were the top positive feelings reported after using Facebook while the top negative feelings experienced were feeling envious (45.24%), tired (40.92%), and sad (40.06%).

Table 11. Percentage Distribution of the Respondents' Feelings after Facebook Usage

Feeling	Percentage
Informed	79.25
Joyful	47.26
Envious	45.24
Satisfied	40.92
Tired	40.92
Sad	40.06
Bored	36.89
Relaxed	35.55
Frustrated	31.79
Lonely	25.36
Angry	19.65
Guilty	17.87

4. Discussion

In this study, it was found that college students very frequently send private messages and view videos and frequently comment on other friends' posts and share links. According to Golder et al. (2007), most people use Facebook to maintain and build social ties across distances through messaging. Instant messaging makes some adolescents feel a sense of belongingness and emotional relief (Favor 2015). Viewing videos is important for adolescents because it is an avenue for growing one's offline and online connections, for one's entertainment and leisure, and further growth of ideas (O'Keeffe and Clarke-Pearson 2011). People give comments on Facebook whenever they want to convey something to someone. Through commenting, they are able to freely express their thoughts and ideas on certain events and situations. Most Facebook users think that it is more satisfying to give or receive comments compared to likes (Kolowich 2015). Facebook users share links to bring valuable and entertaining content to their Facebook friends, give others a better sense of who they are and what they care about, stay connected to the people significant to them, share information which makes them feel more involved in the world, and support causes/issues they care about (Seiter 2016).

In terms of the relationship of sex category with depression level, this study found a weak positive association between them. There are more female students who experience mild and major depression levels than males in this study. According to WHO (2012), depression is two to three times more common in women. Peden et al. (2000) stated that sex has a significant role in the presence of depression in undergraduate females. There are several theories which correlate sex to genetic vulnerability, hormones, and environmental stress (Harvard Medical School 2011). It is believed that only women experience certain genetic changes linked to the development of depression. Also, fluctuations in the female hormones (e.g. estrogen) have a great effect on women's subjection to depression, thus, they have a higher possibility to become depressed during stressful events than men and are more prone to stress caused by child sexual abuse, adult sexual assaults, and domestic violence (Harvard Medical School 2011).

In this study, age has a very weak negative association with depression level. Based on mean scores, depression levels did not vary much across the ages, possibly due to their similar age grouping. The mean age for all depression levels was 19 years. However, neurobiological and social changes are occurring at this time which may explain this association. First, adolescence is the period where the brain undergoes drastic changes in prefrontal and subcortical regions (Miguel-Hidalgo 2013). Neurobiological changes (e.g. increased activity of the prefrontal region as an indication of maturation and diminished activity in irrelevant brain regions) happen which make the adolescents more reactive to their surroundings, in which emotional problems and behavioral regulation surface (Burt & Masten 2010; Casey et al. 2011). Secondly, the Developmental Task theory considers societal expectations according to age and these are used to judge the success of an individual (Strickland 2014). Not all adolescents are able to achieve these tasks such as preparing for a career after graduation in order to help the family's financial situation. Their disappointment in not meeting society's expectations commonly results to the build-up of a wall between them and their parents. They may get more involved with their peers which increases their susceptibility to problems like mental illness, early pregnancy, premature independence, and dropping out from school. Developmental tasks change when the adolescent becomes an "emerging adult" and they are likely to experience the pressures related to committing to a romantic relationship, building a family, career establishment, and civic work involvement.

Results of this study show that sexual orientation and depression level are moderately associated. Of those who are not heterosexual, majority have major depression levels. One explanation could be their need to cope with offenses against them or issues like verbal and physical abuse, discrimination, rejection by significant others, bullying, prejudice, harassment, and psychosocial hardships caused by HIV/AIDS. These experiences of the LGBTQ youth while growing up are forms of victimization which may give rise to psychological conflicts (Rivers and D'Augelli 2001). Concerning the socio-cultural level, some institutions (e.g. schools, families, faith communities) provide inadequate support in guiding the LGBT youth which results to non-empowerment of rights and non-protection leading to their vulnerability, thus, compromising their mental health. Positive family relationships are very important for their well-being (Steinberg & Duncan 2002) but most LGBT youth are frightened to let their parents know (Potoczniak et al. 2009) as they may be rejected due to their personalities (Ryan et al. 2009). Lastly, there are youth who are not equipped with intrapersonal skills and resources to get by with their minority stress experiences or may enhance maladaptive coping strategies as a result of stress related to discrimination and prejudice experiences (Hatzenbuehler et al. 2009; Meyer 2003). Homosexual adolescents were more likely to show poorer emotional alertness compared to heterosexual peers; this inadequate emotional regulation was linked with later symptoms of depression and anxiety (Hatzenbuehler et al. 2008).

In this study, socioeconomic status (SES) has an inverse relationship with depression level. Those who have lower family incomes tend to have higher depression levels than those in the middle income and high income families. The connection between socioeconomic status and mental health concerns is one of the most significant aspects of the relationship of social structure to mental health and one of the most consistent relationships in the field of psychiatric epidemiology. Income is relatively important to an individual's well-being as it helps people to acquire their basic material needs (Clark et al. 2008). Those from lower SES are more susceptible to stressful life events beyond their control. They have lesser social and psychological resources that can aid them to get by stressful life events, thus, they become more vulnerable to stress. They also have a lesser chance to form, maintain, and access social networks that can protect them against the effects of stressful life events (Eaton et al. 2001). Hence, their greater exposure to more stressful life events affect their emotional functioning.

Relationship status and depression level were shown to be moderately associated in this study. Those who are romantically involved tend to have scores in the major depression category as compared to single adolescents. Involvement in a romantic relationship may cause feelings of depression (Greca & Mackey 2007). This could be due to the emotional intensity, depth of emotional investment, and variability in relationships. These are given greater attention by adolescents compared to other aspects of their social life such as school or family since one's romantic experience has a significant role to his/her self-concept and personal growth. They are more susceptible to use their relationship as an instrument to measure their self-worth (Rudolph & Conley 2005). Negative romantic interactions are associated with rejection sensitivity and may cause feelings of stress, which may lead to depression (Larson et al. 1999). Green et al. (2007) discovered that people who reflect on their past romantic relationships tend to feel distant from their ideal self and this may cause depression. Relationship issues have a great effect on mental health, particularly, if the commitment and personal investments are high. The deeper the person's relationship commitment, the greater the investment such as feelings, resources, and time for the other. A serious relationship also includes certain elements like shared activities, shared friends, and public displays of the relationship (Johnson 1991).

This study found that as the number of minutes spent on Facebook increases, the depression level increases as well. Those who were in the category of major depression spent more minutes on Facebook/day compared to those in the minimal depression category. Recent studies (Lin et al. 2016; Brooks & Longstreet 2015; Strickland 2014; Ólafsdóttir 2015) about the association of social media use and depression validate the results. There was a statistically significant relationship between Facebook usage (in terms of number of hours and frequency) and depression level of the students, especially for those who use it excessively (Starr & Davila 2009). Excessive Facebook usage promotes sedentary behaviors like sitting and lying down which affect one's mental health and increases the risk of developing depression (Sanchez-Villegas et al. 2008; Demyttenaere et al. 2004). People who spend more time in sedentary behaviors have less time for other endeavors such as face-to-face social interaction and physical activity/exercise, which are believed to be protective factors against mental disorders (Martinsen 2008). Prolonged engagement in sedentary behaviors also leads to the failure of social support which increases the risk of depression (Kraut et al. 2002). Further, depression is connected to sleep interruption due to social media use (Li et al. 2013). The mobile devices and computer screens emit high levels of blue light which disrupt the body's circadian rhythm responsible for the sleep cycle (Czeisler 2013) and may cause a negative effect on one's mental health. Sleep interruptions may limit one's ability to process certain neurotransmitters, making one more receptive to negative emotions (Strickland 2014). Longer Facebook use seems to make one vulnerable to distress.

The more frequent a student visits his/her Facebook account, the higher his/her depression level. Those who were in the category of major depression visited Facebook more times in a day compared to those in the minimal depression category. One significant process in adolescent life is identity formation. They often ask 'Who am I?' when they begin identity exploration (Subrahmanyam et al. 2006) and are influenced by reactions and opinions of significant others and other people in their lives. The internet has become a prominent means of discovering adolescent identity. They find that the internet and social personal web pages are a safe venue where they can explore or introduce new personalities without being rejected or embarrassed (Subrahmanyam et al. 2006). Facebook, in particular, has provided the youth with a particular space where they can position themselves in a textural/multimedia forum where they can see and be seen by others. Most adolescents tend to use Facebook for positive self-presentation where they only select the socially desirable images to share on their profile (Uhlir 2015). Recent studies showed that frequent exposure to other's positive self-presentations on Facebook elicit feelings of envy and jealousy. The longer people use Facebook, the more they compare their lives to others (Chou & Edge 2012). Individuals tend to believe that others have better and happier lives than themselves (Chen & Lee 2013). Thus, frequent Facebook use is correlated to greater psychological distress.

Depression level also increases as frequency of usage of Facebook activities increases especially for checking on someone, commenting, and viewing videos. Facebook users often engage in surveillance about others (Whiting & Williams 2013). Checking on the status updates of Facebook friends, such as their achievements and activities, may lead to the belief that others are more successful. Social comparison via social networking sites is highly influential to adolescents (Shapiro & Margolin 2013). Invitations to important events and announcement of achievements can be posted, shared, and congratulated, and can be a point of comparison for ones' own accomplishments. Social comparisons made on Facebook are associated with depressive symptoms, especially when they are engaged in frequently (Raymer 2015). This affects individuals with low self-esteem more. As they see others' achievements, photos, and status updates, they evaluate themselves negatively (Vitelli 2015). Likewise, bad news, questionable information, and compromising pictures can quickly spread throughout the adolescents' social network. Their impulsive reaction to share the information quickly, together with the power of social networking sites in terms of rapid and wide distribution of communications, can significantly affect an adolescent's world.

Facebook usage can give rise to both positive and negative feelings. In order to experience successful social interactions, people depend on their capacity to understand another person's emotions (Norscia & Palagi 2011). This capacity may lead one to imitate other's expressions, dispositions, and actions, resulting to the convergence of emotions called "emotional contagion" (Hatfield et al. 1993). Recent studies revealed that emotions can be moved from one person to another, not only in face-to-face communication (Hancock et al. 2008; Neumann & Strack 2000), but also through computer-mediated-communication (Coviello et. al. 2014; Kramer 2012). Thus, seeing others' positive or negative news on Facebook may result to corresponding positive and negative emotions via emotional contagion.

Thus, it is important for the youth to regulate their social media use, particularly Facebook usage, to lessen the likelihood of emotional contagion of negative emotions, social comparison, and the emergence of feelings of envy and jealousy, which may be the origin of depressive symptoms.

5. Recommendations

It is recommended that young Facebook users should not excessively engage in it as a surveillance device to keep track of other's activities and achievements in order to avoid social comparisons, envy, and depression. This recommendation is highlighted for young females, youth who are not heterosexuals, youth coming from the low-income families, and youth with romantic relationships since these were the youth groups which showed weak to moderate relationships with depression levels. Balancing Facebook usage with face-to-face social interactions with significant others can be a more rewarding experience.

Parents are recommended to guide and monitor their children in their digital activities within negotiated limitations or rules and open communication. Forging family bonding activities may strengthen family relations, parent-adolescent interactions, and adolescent self-esteem.

Interventions like seminars and workshops can be done in the educational setting and in the communities to promote awareness on how social media usage may impact mental health states of the youth.

Future studies may explore other adolescent groups like out of school youth and high school students and different age groups like young professionals, middle-aged adults, and elders since using Facebook has been a significant part of Filipinos' lives. Other mental health scales may be utilized in assessing other mental health states. A qualitative analysis on the emotions felt while or after using Facebook may also provide a better understanding of the antecedents of depression.

6. Limitations

The study aimed to determine the relationship of the level of depression of adolescents to their age, sexual orientation, socioeconomic status, relationship status, and Facebook usage only. Non-probability sampling was used, thereby, the results are applicable only to the concerned respondents. Generalized research findings should not be expected as the study does not reflect the overall condition of the college students in the Philippines. This research did not explore other social media sites which the youth utilize and other factors that may affect the level of depression of students such as family relationships, parenting styles, peer influences, and religious factors. The assessment test was based on self-reports and no clinical tests nor personal observations were used to further validate the answers of the respondents regarding their mental health state.

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International Journal of Psychology and Educational Studies, 2019, 6 (2), 51-58

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International Journal of Psychology and Educational Studies

Investigation of High School Students' Internet Parental Styles in Relation with Several Variables

Harika Selvi[1], Mehmet Barış Horzum[2] & Yasin Üngören[1]

[1]*Sakarya University, Institute of Educational Sciences, Sakarya, Turkey*

[2]*Sakarya University, Faculty of Education, Sakarya, Turkey*

ARTICLE INFO

Article History:
Received 24.04.2019
Received in revised form 11.05.2019
Accepted 18.05.2019
Available online 26.05.2019

ABSTRACT

The aim of this study is to investigate internet parental styles of high school students in terms of gender, grade and parental warning. The sample of the study consists of high school students, who were selected through convenience sampling method, studying in the city of Sakarya. In this study, Ayas and Horzum (2013), the Turkish version of ''Internet Parental Style Scale'', was used. The scale was developed in Dutch by Rooij and Eijden (2007) and translated into English by Valcke et al. (2010). The scale has two sub-dimensions: family control and family intimacy. The findings of the study revealed that internet parental styles of high school students differed according to gender and grade, but it did not show a significant difference according to the parental warning.

Keywords:
Internet Parental Style, Gender, Grade, Receiving Warning

1. Introduction

In today's world, the use of internet is rapidly increasing and becoming widespread. Internet has become indispensable in the lives of individuals due to the means and facilities it provides to access communication and information (Ayas and Horzum, 2013). The number of internet users is increasing day by day as a result of the widespread use of it in daily life. According to the report "Digital in 2018" prepared by "We Are Social" and "Hootsuite" in January 2018, the number of internet users worldwide has increased by 9.1% and reached 4.38 billion people.

The number of people who use the Internet throughout Turkey has reached 59.36 million people with an increase by 9.3% when compared to last year. According to the data, 72% of Turkey's population uses the internet (We Are Social, 2018). The Internet addresses people from different backgrounds with different age groups and it is used by individuals for different purposes. Bujala (2012) has determined that the most performed activities in internet use for girls and boys are checking e-mails, surfing on the web and following the news. In addition, it is concluded that the internet is used for visiting social networks, doing research, instant messaging, sending e-mails, downloading or listening music, visiting video sharing sites, health issues and entertainment. A research study, in which the criteria for problematic internet use with high school students were determined, found that the girls used the internet for chatting and social networks and the boys used it for online games or online purchases. In the same study, it was concluded that girls spent more time on the internet than men (Fernandez-Villa et al., 2015). The Internet is generally used for communication, quick access to information, following up-to-date developments, shopping and bank affairs (Balcı and Ayhan, 2007).

[1] Corresponding author's address: Sakarya University, Institute of Educational Sciences, Sakarya, Turkey
* This paper is presented at ERPA Congress 2018.
e-mail: yasinungoren@gmail.com
http://dx.doi.org/10.17220/ijpes.2019.02.005

As a result of the rapid development of information technologies, the Internet is used in all subject areas of life, and when it is used correctly, it provides important skills such as access to information, problem solving and self-learning (Ayas and Horzum, 2013). However, when the internet is misused and over-used, it may cause some problems. Excessive use of the Internet may cause negative effects such as loneliness, communication anxiety and popularity anxiety in individuals (Odacı and Kalkan, 2010). In addition, Çuhadar (2012) notes that the use of internet may cause social interaction anxiety. Furthermore, uncontrolled use of internet may cause psychosocial dissonance by increasing the likelihood of hyperactivity and behavior problems in individuals, especially in adolescents (Kormas, Critselis, Janikian, Kafetzis & Tsitsika, 2015). However, the increase in the time spent on the Internet may lead to consequences such as substance use, aggression and depression (Liu, Desai, Krishnan-Sarin, Cavallo and Potenza, 2011). When the internet is misused and used uncontrollably, it may result in behavior problems, hyperactivity and depression, and may cause weakened physical health and effected daily life activities (Asam, Samara and Terry, 2019).

Baumrind (1971, 1991) describes parental styles through parental control and parental warmth, which are two different aspects of parenting behavior. Parental control includes family guidance, stopping certain behavior related to the internet, and setting rules for internet use (Uysal, Çakıroğlu, & Horzum, 2017). Parental warmth, on the other hand, explains child support and the degree of communication with the child (Valcke et al., 2010). Parental style plays an important role in determining the behavior of children and adolescents, parent support strongly influences their development (Wilmshurst, 2008).

Families must be very cautious in order to protect children and adolescents from psychological and sociological negative effects of excessive internet use. In a study examining the relationship between the child and the family for the use of the Internet, it was concluded that the parents did not control enough about the children while they were on the Internet and they did not take enough precautions to protect their children from the negative effects of the internet (Kırık, 2014). One of the reasons for individuals' orientation to the Internet is the lack of good relations with the family (Bayraktutan, 2005). In a study which parents' style and behaviors towards their parents were investigated, it was revealed that families did not have enough knowledge about how to control their children on the internet, they could not control them, they used the internet for reward or punishment and they could not spend quality time with their children (İnan, 2014). It has been concluded that having a sufficient level of knowledge about the use of the internet is very important for the protection of children. Park, Kim and Cho (2008) concluded that parents' attitudes, communication within the family, family harmony and family violence and internet addiction were related. Doğan (2013) remarked that the individuals who used the internet at home, had parents using cigarettes and alcohol and who had working mothers were at a higher risk of internet addiction.

Altıntaş and Öztabak (2016) found a positive relationship between overuse and problematic internet use of individuals and protective and demanding and authoritarian style of families and found a low negative relationship with democratic family style. Ayas and Horzum (2013) concluded that parents who showed laissez faire family style played an important role in internet addiction. Çevik and Çelikkaleli (2010) found that families with a laissez faire style were more likely to have higher levels of internet addiction compared to individuals with permissive, authoritarian and authoritative parental style.

It is seen that internet parental style is associated with the internet use and duration (Eastin, Greenberg & Hofschire, 2006; Ihmeideh and Shawareb, 2014; Lee, 2013; Livingstone and Helsper, 2008; Valcke et al., 2010), educational use of internet (Horzum and Bektaş, 2014; Lee and Chae , 2007), problematic internet use and internet addiction (Ayas and Horzum, 2013; Cheung, Yue & Wong, 2015; Leung and Lee, 2012; Moazedian, Taqavi, HosseiniAlmadani, Mohammadyfar, & Sabetimani, 2014), parental style in everyday life (Deniz, Ayas, Horzum & Koç, 2016); online information research strategies (Uysal, Çakıroğlu, & Horzum, 2017); and attitudes towards internet and self-efficacy (Alpaslan, 2014) in the research studies. In addition, there are studies which have investigated internet parental style in relation to gender (Ayas and Horzum, 2013; Horzum, Duman and Uysal, In press) and age (Deniz et al., 2016; Gutman et al., 2011; Horzum, Duman & Uysal, In press; Özgür, 2016; Rosen, Cheever, & Carrier, 2008). When the literature is examined, it is seen that the family internet parental style has an effect on the internet usage of individuals. It has been identified that the research about internet parental style is rare in Turkey. Due to the fact that the studies about the subject matter are inadequate and the studies which have been conducted with high school students about the internet parental style are even more scarce and internet parental style has a role in individuals' use of internet and therefore it becomes necessary to investigate internet parental style of high school students in Turkey. The aim of this study is, to this end, to examine whether the high school students' internet parental styles differ in gender, grade, and the parental warning when they receive the internet for a long time or not.

2. Method

The research was carried out in accordance with the cross-sectional survey design. Cross-sectional studies are generally defined as research involving a community which includes a large and diverse sample (Büyüköztürk, 2013).

2.1. Participants

The study participants consisted of 722 high school students in Sakarya, which were selected by convenience sampling method. Information on the demographic characteristics of the study group is shown in Table 1.

Table 1. Distribution of the sample group by gender, parent and grade

Variables		Frequency (f)	Percentage (%)
Gender	Female	357	49,4
	Male	365	50,6
Parent	Mother	511	70,8
	Father	211	29,2
Grade	9th Grade	166	23
	10th Grade	222	30,7
	11th Grade	179	24,8
	12th Grade	155	21,5
	Total	722	

2.2. Instruments

In this study Turkish version of ''Internet Parental Style Scale'' was used. The scale was developed in Dutch by Rooij and Eijden (2007) and translated into English by Valcke et al. (2010) and translated to the Turkish Ayas and Horzum (2013). The scale consists of 25 items which are 5-Likert items and consists of 2 factors. The scale has two sub-dimensions: parental control and warmth. The Cronbach alpha internal consistency coefficient of the Internet Parental Style Scale is 0.94. The score of sub-dimensions is between 11 and 55 in family control and 14 to 70 in family warmth.

2.3. Data Collection and Analysis

The scales were distributed by hand to high school students who studied in Sakarya, Turkey on a voluntary basis. SPSS 21 was used for the analysis of the data. Since the collected data met the normal distribution hypothesis, parametric tests were performed. In the analysis of the data, t-tests were used to analyze gender and the parental warning differences for internet parental styles; one-way ANOVA was used to analyze the grade differences for internet parental styles. A statistical significance level of .05 was used.

3. Results

Findings of the research were presented with sub-groups as gender, grade, and parental warning. Firstly, independent samples t-test was conducted for gender and the data obtained from the analysis are given in Table 2.

Table 2. T-Test Results of Internet Parental Style Levels According to the Gender of High School Students

Internet Parental Style Factors	Gender	N	$\bar{x}$	SD	df	t	p
Parental Control	Female	357	19,85	8,08	720	2,44	,015
	Male	365	18,36	8,17			
Parental Warmth	Female	357	36,63	13,49	720	8,14	,000
	Male	365	28,28	14,07			

When the results of Table 2 were examined, it was found that there was a significant difference in terms of internet parental style, parental control (t = 2,44) and warmth (t = 8,14) according to gender ($p <.05$). According to the results of the analysis, the parental control of the female students ($\bar{x}$= 19.85) were found to be higher than the parental control of the male students ($\bar{x}$ = 18.36), the family warmth of female students ($\bar{x}$= 36.63) were found to be higher than the family warmth of male students ($\bar{x}$= 28.28).

In the research, it was examined whether the internet parental styles differed according to the grades of the students. As the data covered 4 different grade levels, internet parental style was examined by one-way ANOVA according to grade. The data obtained from the analysis are shown in Table 3.

Table 3. The Difference in internet parental style of the High School Students According to the Grade Level One-Way ANOVA.

Factors	Grade	N	$\bar{x}$	S		Sum of Squares	DF	Mean Square	F	p	Post-Hoc (Bonferroni adjustment)
Parental Control	9	166	20,09	7,99	Between Groups	704,67	3	243,89	3,568	,014	9-12, 10-12
	10	222	19,81	8,65							
	11	179	18,70	7,61	Within Groups	47271,74	718	65,83			
	12	155	17,49	7,99							
	Total	722	19,10	8,15	Total	47976,41	721				
Parental Warmth	9	166	33,52	13,12	Between Groups	3949,22	3	1316,40	6,492	,000	9-12, 10-12
	10	222	34,95	14,72							
	11	179	31,46	14,49	Within Groups	145581,94	718	202,76			
	12	155	28,68	14,37							
	Total	722	32,41	14,40	Total	149531,17	721				

Parental control ($F_{(3, 718)} = 3.56$) and warmth ($F_{(3, 718)} = 6.41$) were found to be significantly different ($p <.05$) among high school students according to their grade. Bonferroni multiple comparison tests were used to determine which grade was the source of the difference in the factors determined. As a result of the multiple comparison test, it was determined that the students in the 12th grade had significantly lower internet parental control levels ($\bar{x}$= 17.49) than those of 9th grade ($\bar{x}$= 20.09) and 10th grade ($\bar{x}$= 19.81) students. Likewise, it was found that the students in the 12th grade had significantly lower internet parental warmth levels ($\bar{x}$= 28,68) than those of 9th grade ($\bar{x}$ = 33,52) and 10th grade ($\bar{x}$ = 34,95) students according to the multiple comparison test.

As the third variable in the study, when high school students used the Internet for a long time, they received warnings from their parents, and in this respect, whether the internet parental style according to the parental warning differed or not was examined. Independent samples t-test was performed in order to analyze the differences about internet parental styles depending on from whom the students received warnings when they used the internet for a long time and the results are presented in Table 4.

Table 4. T-Test Results for Internet Parental Style Levels According to the Parental Warning of High School Students

Internet Parental Style Factors	Warning	N	$\bar{x}$	SD	df	t	p
Parental Control	Mother	511	19,33	8,25	720	1,18	,238
	Father	211	18,54	7,91			
Parental Warmth	Mother	511	32,56	14,27	720	0,43	,660
	Father	211	32,04	14,72			

Table 4 showed that internet parental styles of the participating students did not yield statistically significant differences (p >.05) in terms of parental control (t = 2,44) and warmth (t = 8,14) when analyzed according to the variable of parental warning. In other words, the fact that the high school students received warnings from their mothers or fathers when they used the internet for a long time did not show a statistically significant difference for internet parental styles.

4. Discussion

The aim of this current study is to investigate whether the internet parental styles of secondary school students vary according to gender, grade level, and from whom they receive warnings when they spend too much time on the Internet. In line with this aim, the scarcity of the studies conducted on secondary school students' internet parental styles in Turkey increases the importance of this study. The fact that the internet parental style has a great effect on individual's use of internet as reported in the literature increases the importance of the present study.

The current research has showed that the female students' families have higher control over their internet use and higher warmth when compared to male students' families. This finding suggests that families are more democratic for their daughters and they are laissez-faire or permissive for their sons. The results are consistent with the findings of Ayas and Horzum (2013) and Deniz, Horzum, Ayas and Koç (2016), which were conducted with secondary school students, in that gender is significantly associated with internet parental style and laissez faire internet parental style is higher for male students. Moreover, Horzum, Duman and Uysal (In press) found that there was a gender difference in terms of family control and warmth. In the study, it was found that the families of female participants aged 10-17 were more attentive than the families of male participants in terms of both control and warmth. Accordingly, families may be more permissive or laissez faire about boys. The reason for more permissive or laissez faire of the families of male children may be that computers, internet and other technological tools are seen as male toys by the families (Horzum, 2011).

In the present research, it was found that the family control and warmth of 12th Grade students for internet parental styles were lower than the other grades and the scores were significantly lower than 9th and 10th Grades. This finding was consistent with other studies in the literature examining the relationship between Internet parental style and grade. In other studies in the literature (Ayas and Horzum, 2013; Deniz, Horzum, Ayas and Koç, 2016), it was found that there was a significant relationship between the grade and the internet parental style, and it was found that laissez faire parental style was higher in the upper classes while the authoritative parental style was higher in the lower classes. Additionally, the findings may be supported with the findings of studies in which internet parental styles and age variable were investigated and parental control and warmth were found to decrease as the age increased (Gutman et al., 2010; Horzum, Duman and Uysal, In press; Özgür, 2016; Rosen, Cheever, & Carrier, 2008). Since advancing to a higher grade brings an increase in students' age, the results may be evaluated in a similar vein for grade level. The decrease in the family warmth and control with the increase of the grade level might be denoted as an expected finding by the reason of that towards the end of high school education, students approach the age of 18 at which students start to develop their own free behaviors and move to independent decision-making stages whereby parental control and warmth decrease.

Lastly, in the present study, it was found that parental warning differences when they used the internet for a long time did not yield statistically significant differences for the high school students. The results were in line with Deniz, Horzum, Ayas and Koç (2016) who conducted a study with secondary school students. It was found that the level of education of the parents, whether there was internet at home or not, the levels of internet use of parents, the help they received when they encountered a problem related to the net and from whom they received warnings in case of a long period of internet use were not significant for internet parental styles. This finding indicates that the parent who gives the warning may impose his/her own parental style for the internet use. In addition, this situation may be interpreted as the fact that parents show a family style in a similar way.

The study has some limitations. Firstly, internet parental style data were obtained through the scales given to the students. The parental styles perceived by the students and the actual parental styles may differ. For this reason, in future research studies, students' perceptions and the parental styles reflected by the parents may be investigated or studies can be conducted with parent reflections about internet parental styles. The data were collected from high schools in only one city. In order to reach more generalizable results, future research studies can be carried out by collecting data from cities in Turkey in accordance with three different levels of Turkey Statistical Regional Units Classification .In the study, internet parental style was examined in terms of some demographic variables such as gender, grade and parental warning. The following studies may investigate the demographic variables such as the school type (being private or public), the official status of the environment of the school (city or district), the environment in which students live (urban or rural areas), age, socio-economic situation or technologic facilities. In addition, studies associating personality traits, student's chronotype, sleep time, sleep quality, technology and the duration of the use of technology with internet parental style can be carried out.

In conclusion, it was revealed that family control and warmth in male students' families were low and as the grade increased, family control and warmth decreased. In this respect, it is recommended that the parents should take the responsibility in order for boys to use right technological tools and learn to use internet safely at young ages. In addition, it is expected that the authorities and officers of the schools should have the task of informing and warning the families about this issue and also providing the children with knowledge and skills about safe internet and right technological tools. Public announcements, informative messages, infographics, posters and brochures can be prepared about the issue and a large number of people may be informed through radio, television and social media.

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International Journal of Psychology and Educational Studies, 2019, 6 (2), 59-65

International Journal of Psychology and Educational Studies

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Illustration of Different Modalities of Role-Play for Medical Communication Skills at Undergraduate Level

Abdul Sattar Khan[1], Rabel Khawaja[2], Jihan Hakeem[3], Mohamed Soliman[4], Juliet Balaes[5], Romina Labaniego[6]

[1-6] *College of Medicine, King Faisal University, Saudi Arabia*

ARTICLE INFO

Article History:
Received 07.02.2018
Received in revised form 16.03.2019
Accepted 11.04.2019
Available online 26.05.2019

ABSTRACT

Role-play is commonly used as a learning method for teaching communication in medical institutions and there two types of role-play i.e. Round Robin and Relay`s methods. This study among our students and trainers to identify which role-play has better effect on students learning at college of Medicine, King Faisal University, Al Ahsa. All the first year students and trainers were included in the study. Students are divided into different groups and each group contains 9 – 11 students. Different scenarios are provided to the students with each physician and patient role. A pre-structured questionnaire was distributed among students and trainers to compare between the Role-play methods. The questionnaire included 15 statements related to the role-play methods based on Likert scale. Wilcoxon signed-rank test was applied to compare different items for both methods and to obtain p-value. The results showed that 221 students and 25 trainers filled the questionnaire. The Round Robin was found to have more influence on students` perception as compared to that for Relay`s except for item 4 i.e. role-play builds a team work where majority of participants agreed for Relay`s method. Similar results were found while checking perception of trainers. The results of statistical test for comparing both methods suggest that there is a significant difference in Round Robin and Relay`s method for most of the questions P- value < 0.05. In this research it is found that both methods of role-play used in communication skills sessions are helpful however, Round robin method has better outcome on learning as compared to Relay`s method.

Keywords: Role-Play; Communication Skill; Consultation Skills

1. Introduction

There are many methods to teach and learn communication skills, however role-play is proven to motivate students for active learning. Hence, it is commonly used as a learning method for teaching communication in medical institutions (Nestel & Tierney, 2007). It is defined as," an experiential learning technique with learners acting out roles in case scenarios to provide targeted practice and feedback to train skills" (Kiger, 2004). Characteristically, role-play procedure includes the people who are being trained or evaluated interacting with performers or different simulated patients, using scenarios based on hypothetical or actual grounds as the basis for the simulated consultation (Stokoe, 2011). Through role-play, students hypothesize their roles and develop professional and interpersonal attitude and skills. Role-play is a method, which promotes active learning and reflection in students which is superior to passive learning (Meyers & Jones,1993)). In relation to its teaching part, role-play can be used to develop the cognitive, psychomotor and affective domains of learning (Joyner &Young, 2006).

Role-play is used to enhance communication skills in medical students and has been proven to vitalize the level of pragmatism when incorporated with the technical skill training, which lead to improve patient-

[1] Corresponding author's address: Family & Community Medicine Department, College of Medicine, King Faisal University. P.O. Box: 400, Postal Code: 31892
Telephone: +966-1-35897789 e-mail: amkhan@kfu.edu.sa
http://dx.doi.org/10.17220/ijpes.2019.02.006

doctor interaction (Nikendei, 2007). Role-plays have several comprehendible practices in medical education. Of special relevance to medical field are, authorizing students to place themselves in conditions they had not practiced before, to help them empathize and understand other people's complications and situations (Fertleman, C., Gibbs & Eisen, 2005). Literature further suggests that role-play stimulates student interest; helps correlating previous knowledge and more information is recalled from role-play than from traditional teachings (Joyner & Young, 2006). It is also used to practice skills, discover subtle issues, expose behaviors and sensitize participants to other ideas, attitudes and values. It is a continuous, interactive, dynamic teaching approach that engages students in meaningful learning (Joyner & Young, 2006). Role-play activities can be performed in different ways. Maier suggests that role-play method is selected according to the requirement, whether the learning objective discourses knowledge, attitudes or skills. In the fulfilment of knowledge, role-plays can be valuable to observe and then discuss, for the sake of attitude development, role-play needs be structured in such a way that performer experiences empathy spontaneously. Whereas for skills acquisition, the opportunity for repeated opportunities with feedback is critical (Maier, 2002). For the attainment of patient-centered interviewing skills, the approach in which students play their role as a medical practitioner is used where they are anticipated to perform as they would in real clinical encounters. However, Stevenson and Sander found that role-play and presentations by students were not widely preferred instructional technique by 32% of new medical students (Stevenson, & Sander, 2002). The problem based learning (PBL) curriculum for our medical college was adapted from University of Groningen (UoG) which is based on CanMED competencies and one of those competencies is the communicator (Framework, 2016).

In order to achieve competency of a good communcator by teaching communication skills (CS), we have small group teachings. It comprises role-play with simulated patients who are basically the students chosen from each CS group during CS sessions through pre-constructed roster from CS team. We use two types of role-play i.e. Round Robin method and Relay`s or Carrousel method. Round Robin (Arpaci-Dusseau & Arpaci-Dusseau, 2014) is one of the algorithms employed by process and network schedulers in computing. As the term is generally used, time slices (time quanta) are assigned to each process in equal portions and in circular order, handling all processes without priority cyclic. Whereas, Relays or Carrousel is (Hübscher-Younger & Narayanan, 2003) a communicative and interactive opportunity for participants to get up and move around a room in a circular fashion, stopping intermittingly to comment, discuss, or respond. The Round robin method in CS session includes three students; a doctor, a patient and an observer (figure 1) and Relay`s method (figure 2) comprises of four doctors, four observers – one for each doctor - and a patient. In Relay`s, all four doctors do the consultation with single patient at a time and if one of the doctors isn't performing the skills well, next will tap him and continue from there on and so on. The observers based on the checklist prepared by experts through an iterative process and Pendleton's rule (Cantillon & Sargeant, 2008) for both role-play methods in a similar way gives the feedback. Although there is no published evidence to suggest which method has better learning outcome, therefore, we conducted this study among students and trainers to distinguish and identify which role-play has better effect on students learning.

2. Method

A comparative corss-sectional analystical study was condcuted in 2018 at the college of medicine for comparison of two methods of role-play for communcation skills. Communication skill session in PBL setting at our college is taken as small group teaching where micro-skills, meso-skills and breaking bad news along with sexuality are taught from year 1 to year 3 respectively (Barsky, 2016; Baile, 2000). All the trainers are pre-trained for the sessions. Before start of sessions, workshops are conducted in order to train the trainers for micro, meso skills and breaking bad news and introductory session is conducted for students to give an overview. Micro-skills include: paraphrasing, prompting, showing empathy, asking open and close ended questions, making specific, summarizing, safety netting and meso-skills are: active listening accommodating, investigative questioning, explaining, informing, advising, motivating, coaching, instructing, reaching consensus. Students are divided into different groups and each group contains 9 – 11 students. An interactive session with video demonstration, discussion and role-play consultation is conducted. For role-play, two methods are used i.e. Round Robin and Relay`s method – description of each is given in introduction. In all, 6 sessions for communication skills are conducted in year 1. Of which, Round robin is practiced in 4 sessions and Relay`s method is performed in remaining two sessions. Different scenarios are provided to the students with each physician and patient role. However, patient role is kept only for simulated patients, where trainers guide them in separate room. Simulated patients are the students chosen as patients from each group for each session as per roster constructed by the CS coordinator.

The study was conducted at college of Medicine, King Faisal University, Al ahsa. We have communication skills in all three years. A sample size of 221 seclected all first year students and all 25 trainers were invloved in teaching included in the study. A pre-structured questionnaire was distributed among students and trainers at the end of block 1.4. The questionnaire included 15 statements related to the role-play methods based on Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. A validtaed questionnaire was used based on previous study (Khane & Joshi, 2014) done in India at private medical college. However, this study had different context and method. Therefore, the questions were modified and more items were added by CS and Medical education experts based on the teaching of CS sessions and according to the competencies relevant to communication skills. We tried to measure the effectiveness of two different methods of role play through the questionnaire. Data was collected and entered in to SPSS version 20.00. It was then cleaned and percentage, mean and standard deviation were computed for all the items. Wilcoxon signed-rank test was applied to compare different items for both methods and to obtain p-value. A P-value of <0.05 was considered as significant.

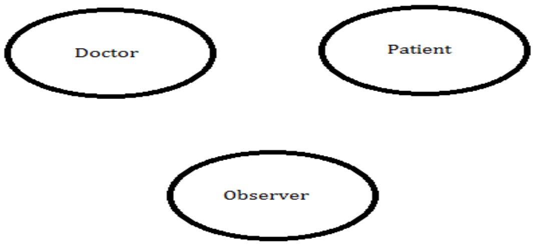

Figure 1. Round robin Method

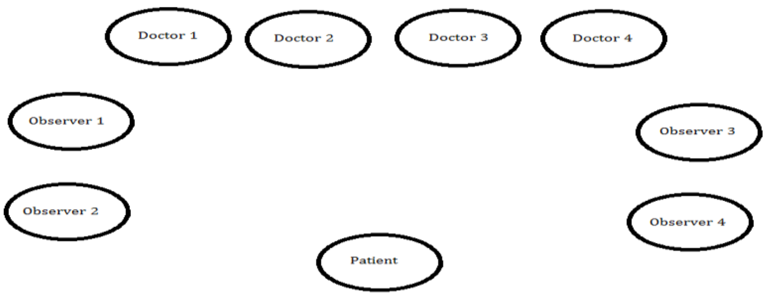

Figure 2. Relay`s method

3. Results

The results showed that 221 students and 25 trainers filled the questionnaire of which 51% were males and 49% were females. The majority of first year medical students' perception on comparison between role-play was significantly different (Table 1).

Table 1. Responses of students to individual items of the questionnaire

Role Play	Round Robin Responses					Relay's Responses				
Statements	SA	A	N	D	SD	SA	A	N	D	SD
Role – Play is enjoyable	51(23%)	90(41%)	57(26%)	14(6%)	6(3%)	47(21%)	59(27%)	62(28%)	30(14%)	11(5%)
Role – Play helps to improve knowledge	48(22%)	98(44%)	48(22%)	17(8%)	7(3%)	40(18%)	77(35%)	52(23%)	22(10%)	14(6%)
Role – Play improves communication skills	79(36%)	97(44%)	29(13%)	8(4%)	2(1%)	54(24%)	81(37%)	48(22%)	11(5%)	10(4%)
Role – Play builds a team work	40(18%)	72(33%)	64(29%)	30(14%)	9(4%)	84(38%)	70(32%)	35(16%)	11(5%)	9(4%)
Role – Play is an interesting mode of learning	62(28%)	71(32%)	55(25%)	22(10%)	3(1%)	61(28%)	53(24%)	61(28%)	23(10%)	8(4%)
Role – Play generates better attention span	44(20%)	84(38%)	67(30%)	18(8%)	5(2%)	38(17%)	70(32%)	73(33%)	17(8%)	9(4%)
Role – Play helps in developing self-confidence	82(37%)	77(35%)	42(19%)	14(6%)	4(2%)	69(31%)	80(36%)	35(16%)	13(6%)	9(4%)
Role – Play have an important role for consultation skills	89(40%)	82(37%)	34(15%)	8(4%)	3(1%)	59(27%)	85(38%)	37(17%)	16(7%)	8(4%)
Role – Play is very useful teaching method	74(33%)	71(32%)	54(24%)	18(8%)	3(1%)	58(26%)	58(26%)	60(27%)	24(11%)	10(4%)
Role – Play enables to deal real patient in future	74(33%)	78(35%)	49(22%)	9(4%)	8(4%)	45(20%)	67(30%)	60(27%)	20(9%)	16(7%)
Role - play requires to be immersed, practical, and able to make decisions	60(27%)	88(40%)	61(28%)	9(4%)	2(1%)	36(16%)	82(37%)	65(29%)	18(8%)	7(3%)
Role-Play motivates to participate actively in the discussion	68(31%)	79(36%)	58(26%)	10(4%)	6(3%)	50(23%)	77(35%)	55(25%)	18(8%)	9(4%)
Role - Play improves my critical / analytical skills	52(23%)	92(42%)	53(24%)	19(9%)	3(1%)	44(20%)	78(35%)	62(28%)	15(7%)	8(4%)
Role-Play helps me to gain greater sense of empathy	63(28%)	67(30%)	56(25%)	22(10%)	10(4%)	30(14%)	59(27%)	74(33%)	31(14%)	11(5%)
Role - Play develops my awareness of oneself in relation to others	61(28%)	86(39%)	53(24%)	15(7%)	5(2%)	49(22%)	76(34%)	55(25%)	17(8%)	10(4%)

Key: SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly Disagree
(Results expressed as the number of students (n = 221) and percentage (in brackets) who gave a particular response on a 5 point Likert scale to each of the 15 items of the questionnaire).

In responses to most of the questions, Round Robin was found to have more influence on students` perception as compared to that for Relay`s except for item 4 i.e. role-play builds a team work where majority of participants agreed for Relay`s method. Similar results were found while checking perception of trainers (Table. 2) except for difference of opinion on item 2 and 6 rather than item 4. The perception on question 2 and 6 i.e. role-play helps to improve knowledge and role-play generates better attention span; was found to have tie between both methods. Furthermore, there was no significant difference found between the role-play methods and gender for both students and trainers.

Table 2. Responses of trainers to individual items of the questionnaire

Role Play	Round Robin Responses					Relay's Responses				
Statements	SA	A	N	D	SD	SA	A	N	D	SD
Role – Play is enjoyable	10(45%)	7(32%)	4(18%)	1(4%)	0	8(36%)	7(32%)	5(23%)	1(4%)	1(4%)
Role – Play helps to improve knowledge	8(36%)	11(50%)	2(9%)	0	1(4%)	8(36%)	7(32%)	6(27%)	0	1(4%)
Role – Play improves communication skills	12(54%)	7(32%)	3(18%)	0	0	8(36%)	7(32%)	5(23%)	1(4%)	1(4%)
Role – Play builds a team work	7(32%)	6(27%)	6(27%)	2(9%)	1(4%)	11(50%)	6(27%)	3(18%)	1(4%)	0
Role – Play is an interesting mode of learning	10(45%)	10(45%)	1(4%)	0	0	4(18%)	9(41%)	5(23%)	0	1(4%)

Role – Play generates better attention span	8(36%)	11(50%)	2(9%)	1(4%)		8(36%)	6(27%)	6(27%)	0	1(4%)
Role – Play helps in developing self-confidence	12(54%)	7(32%)	2(9%)	0	0	8(36%)	9(41%)	3(18%)	0	1(4%)
Role – Play have an important role for consultation skills	12(54%)	9(41%)	1(4%)	0	0	7(32%)	11(50%)	2(9%)	1(4%)	1(4%)
Role – Play is very useful teaching method	9(41%)	10(45%)	2(9%)	0	0	6(27%)	11(50%)	2(9%)	1(4%)	1(4%)
Role – Play enables to deal real patient in future	7(32%)	10(45%)	4(18%)	0	0	3(18%)	12(54%)	3(18%)	2(9%)	1(4%)
Role - play requires to be immersed, practical, and able to make decisions	9(41%)	10(45%)	2(9%)	1(4%)	0	6(27%)	9(41%)	5(23%)	1(4%)	1(4%)
Role-Play motivates to participate actively in the discussion	9(41%)	10(45%)	3(18%)	0	0	8(36%)	8(36%)	5(23%)	0	1(4%)

Key: SA = Strongly Agree, A = Agree, N = Neutral, D = disagree, SD = strongly disagree
(Results expressed as the number of trainers (n = 25) and percentage (in brackets) who gave a particular response on a 5 point Likert scale to each of the 12 items of the questionnaire)

The results of statistical test for comparing both methods suggests that there is significant difference in Round Robin and Relay`s method for most of the questions P- value < 0.05 (table 3). However, there was no significant difference on role-play is an interesting mode of learning (P-value 0.062 (CI = 0.052 – 0.061)), role-play generates better attention span (P- value 0.138(CI = 0.129 – 0.142)) and role-play helps in developing self-confidence (P-value 0.178 (CI = 0.170 – 0.185). Overall, the results suggest that there is difference between both methods and both students and trainers perceive Round Robin positively.

Table 3. Comparison of sub-scores of both role-plays for each item in the questionnaire

Variables	Round Robin's Method	Relay's Method			Test Statistics	
	Mean	SD	Mean	SD	P - Value	Confidence interval
Role – Play is enjoyable	2.24	0.973	2.52	1.144	0.002	0.002 – 0.004
Role–Play helps to improve knowledge	2.25	0.991	2.48	1.127	0.001	0.000 – 0.001
Role–Play improves communication skills	1.87	0.849	2.23	1.054	0.00	0.000 – 0.000
Role–Play builds a team work	2.52	1.076	2.00	1.083	0.00	0.000 – 0.000
Role–Play is an interesting mode of learning	2.22	1.023	2.34	1.131	0.062	0.052 – 0.061
Role–Play generates better attention span	2.43	1.697	2.55	1.701	0.138	0.129 – 0.142
Role–Play helps in developing self-confidence	2.00	0.995	2.09	1.071	0.178	0.170 – 0.185
Role–Play have an important role for consultation skills	2.00	2.238	2.17	1.053	0.00	0.000 – 0.000
Role–Play is very useful teaching method	2.11	1.012	2.38	1.144	0.00	0.000 – 0.001
Role–Play enables to deal real patient in future	2.08	1.029	2.50	1.159	0.00	0.000 – 0.000
Role-play requires to be immersed, practical, and able to make decisions	2.11	0.887	2.41	.984	0.00	0.000 – 0.000
Role-Play motivates to participate actively in the discussion	2.13	0.992	2.33	1.065	0.003	0.002 – 0.004
Role-Play improves my critical / analytical skills	2.21	0.961	2.34	1.027	0.024	0.023 – 0.030
Role-Play helps me to gain greater sense of empathy	2.31	1.129	2.68	1.068	0.00	0.000 – 0.000
Role - Play develops my awareness of oneself in relation to others	2.17	0.986	2.34	1.076	0.004	0.002 – 0.004

4. Discussion

So far there is no literature availble which compares different methods of role-play using for communication skills. Thus, this study was done to determine the effectiveness of two different types of role-play used for teaching communication skills sessions for under graduate medical students in Saudi Arabia. The overall results suggest that Round Robin has better effect on learning than Relay`s however, Relay`s has also better effect in certain areas like group functioning, an interesting mode of learning and having better attention span. Due to scarcity of literature on such objectives, it is difficult to compare the results of our study with others based on different types of role-play. However, we are comparing the results in general with role pay technique for different studies in line with different questions in our study.

Debra Nestel conducted the study at Imperial College for communication skills in medical students and she suggested that role-play is an effective mean of learning communication skills for medical students (Nestel & Tierney, 2007), which is also consistent with our study however, we couldn`t compare that which type has better effect. As suggested by the results of our study, practicing role-play improves both micro and meso skills. Similar results are reported by Mansfield in 1991 that role-play can be used to teach and practice basic communication skills and it improves performance of the students significantly (Mansfield, F. (1991). It further enhances the level of empathy in the role-players which can lead to powerful behavioral and attitudinal outcomes (McGill & Beaty, 2001).).

These reults are in line with our study where in Round Robin method the application of level of empathy is significantly high whereas, in Relays method due to team work somehow the level of sympathy is lower. Littlefield et al., mentioned in their research that the transition from pre-clinical to clinical years is enhanced by role play and it provides a safe and low-risk learning environment for the students (Littlefiel & Meyer,1999) however, we couldn§t comapre the role play methods with clinical and pre-clinical years but role play enhances the capabilities of students overall. (Neikendei C et al. 2007) suggested similar results, in their randomized control trial that role-play enhances the realism of technical skills training, leading to better patient-physician communication and it is a useful approach in learning communication skills, which is also found similarly in our study. Recently, Suzanne et al, conducted a comparative cross-sectional study in India to compare the perception of role-play and observation as teaching-learning method in physiology. She suggests that students perceived the role-play to be interesting, lively, and helpful in breaking monotony and in visualizing clinical features (Khane, & Joshi, 2014) which is similar to one component of our study where students highly appreciated and significantly took interest in the activity. She further mentioned that the positive perception regarding role-play could be because that role-play is a student-centered teaching learning method, which in accordance with our curriculum, which is problem-based and students centered, is also similar. However, comparison between both methods of role-play is not possible in line with other studies because of different objectives.

5. Limitation

The study is conducted for very first time, so far there is no literature that compares different methods of role-play and their effectiveness in teaching. Limitations of our study include the less number of participants and scarcity of literature on the types of role-play or effectiveness on different types of role-play.

6. Conclusion

Both methods of role-play used in communication skills sessions are helpful however, Round robin method has better outcome on learning as compared to Relay`s method.

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International Journal of Psychology and Educational Studies, 2019, 6 (2), 66-76

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International Journal of Psychology and Educational Studies

An Investigate of Influence Factor for Tertiary Students' M-learning effectiveness: Adjust Industry 4.0 & 12-Year Curriculum of Basic Education

Chun-Mei Chou[1], Chien-Hua Shen[2], Hsi-Chi Hsiao[3], Tsu-Chguan Shen[4],Tsu-Chi Shen[5]

[1] *Institute of Vocational and Technological Education, Taiwan*
[2] *Department of Business Administration, Taiwan*
[3] *Department of Business Administration, Taiwan*
[4] *Feng Chia University,, Taiwan*
[5] *National Yunlin University of Science and Teachnology, Taiwan*

ARTICLE INFO

Article History:
Received 21.03.2019
Received in revised form 13.05.2019
Accepted 20.05.2019
Available online 26.05.2019

ABSTRACT

Mobile learning (M-learning) as a technology teaching has significant potential to improve student application and comprehension skills. The rapid development of the Internet and the resulting trends applying information available on the Internet have changed the nature of learning and learning behavior patterns of tertiary students. However, insufficient theoretical and empirical research on the effect of M-learning on learning attitude and M-learning effectiveness has been conducted for achieving any reliable understanding of the use of M-learning by tertiary students. This, study was therefore based on the theory of planned behavior, and combined the technology acceptance model and the structural equation model (SEM); it involved 892 tertiary student participants, and developed an empirical research model. The study found that in terms of M-learning acceptance, tertiary students have a positive evaluation and perception of using M-learning, with perceived enjoyment being the most significant factor. In addition, the impact of perceived innovation was significant in helping teachers understand students' learning outcomes. The teaching material of learning motivations was also significant, indicating that current tertiary students are more likely to value their friends as sources of information. External influences on self-efficacy were also significant, suggesting that teachers must consider the operability of M-learning technology, with particular attention paid to students' competency with the technology itself, as difficulty of use will reduce students' willingness to use M-learning.

Keywords:
Technology acceptance model, M-learning, Tertiary students, Industry 4.0

1.Introduction

There has been growing interest recently in the application of mobile learning (M-learning) to create a unique educational environment (Chung, Hwang, & Lai, 2019). However, very little research to date has been conducted into such factors such as the advantages, limitations, effectiveness, challenges and characteristics of using M-learning in educational environments. The use of M-learning to promote the personalization of inclusive learning is also an area of increasing interest. According to Bacca et al.'s (2014) vocational educational training (VET) research, only 3.1% of studies in this area of interest were carried out employing a sample of students from vocational educational training institutions (VET) . From the point of view of this study, VET institutions are promising research partners not only for validation, but also for demonstrating the possibilities of M-learning scenarios in improving and acquiring professional competences. For example, M-learning could reduce the cost of carrying out some learning experiences

[1]Corresponding author's address: Graduate Institute of Vocational and Technological Education, National Yunlin University of Science & Technology, Yunlin , Taiwan 64002, R.O.C.
e-mail: choucm@yuntech.edu.tw
http://dx.doi.org/10.17220/ijpes.2019.02.007

where expensive learning material is necessary (Jeno, Vandvik, Eliassen, & Grytnes, 2019; Al-Emran, Mezhuyev, & Kamaludin, 2018a).

M-learning has, to date, primarily been used in education to explain a topic of interest and simultaneously provide additional information. M-learning educational games and M-learning for lab experiments are growing in popularity. The main advantage of M-learning is learning gains, while limitations primarily include difficulties in maintaining superimposed information, students paying too much attention to virtual information, and the consideration of AR as an intrusive technology(Al-Emran, Mezhuyev, & Kamaludin, 2018b; Bakhsh, Mahmood, & Sangi, 2017). M-learning has been effective in producing better learning performance, learning motivation, student engagement and positive attitudes. However, few learning systems have taken into account students' special needs when working with M-learning(Buabeng-Andoh, 2018; Hamidi & Chavoshi, 2017).

In response to the recent rapid development and innovation of intelligent networking (such as the Internet of Things), Taiwan encouraged the growth of IoT technology in colleges and universities by introducing vertical integration systems, rewarding innovators and cultivating future talents with core competence in technological innovation (Chung, Hwang, & Lai, 2019; Hamidi & Chavoshi, 2017). The implementation strategy promotes three key aspects (Hao, Dennen, & Mei, 2017; Harchay, Cheniti-belcadhi, & Braham, 2017):

(1) The horizontal layering technology taking root, vertically integrating system applications, and combining the assistance of cross-disciplinary teachers to enhance the cross-domain knowledge and technology depth of the teachers and students in the field of smart assets, with specific emphasis and enhancement of system design technology, such as wafers

(2) Implementing the teaching spirit and module curriculum development of problem-based learning (PBL), and making good use of resources such as open software and online learning to stimulate students' independent thinking and self-learning in the future in response to the multitude of IoT applications and the characteristics of rapid development

(3) Combining industrial resources, strengthening the practical experience of teachers and students in the field of electricity and capital, and introducing mature and promising industry platforms and solutions to facilitate the rapid development of smart IoT systems, while strengthening their industrial benefits [18] at the same time, with catering to the needs of the five major innovation industries promoted by the government, and cultivating new generations of ICT smart electronic cross-disciplinary industry talents with system innovation and integration capabilities.

Important science and technology development trends in education related to this study are as follows (Chung, Hwang, & Lai, 2019; Hamidi & Chavoshi, 2017):

(1) The teacher's website is currently the most widely used technology tool, allowing students and parents to access class notes, homework, teaching videos and grades.

(2) Less than half of students use social networking sites for educational purposes in schools.

(3) More than one-third of students use apps in schools, usually games.

(4) About half of the schools use laptops, while less than 30% use tablet computers or M-learning for learning purposes.

(5) A quarter of parents think M-learning is better than paper textbooks.

There is still a lot of room for growth in education, and although parents may have different concerns, technology can bring about many advantages, such as the flipped classroom education model, personalized learning environments, online learning, and digital access to the vast amount of available information, facilitating better understanding of the individual circumstances and needs of learners (Al-Emran, Mezhuyev, & Kamaludin, 2018a; Al-Emran, Elsherif, & Shaalan, 2016). Digital learning also offers flexible learning times, and reduces physical space constraints, allowing learning to take place anytime, anywhere, or learning and communicating with people on the other side of the world. As a result, it is easier for people to obtain higher education opportunities via the Internet (Briz-Ponce, Pereira, Carvalho, Juanes-Méndez, & García-Peñalvo, 2017; Harchay, Cheniti-belcadhi, & Braham, 2017).

The technology acceptance model was developed by Davis (1986), based on rational behavior theory. The purpose is to simplify the theory of rational behavior in order to propose a generalized theory with a rigorous and theoretical basis. This model is used to explain and predict the behavior of potential users upon interacting with information technology, and to analyze the factors that affect users' access to information technology. The technology acceptance model TAM considers beliefs: perceived usefulness (PU) and Perceived ease (PEOU) as factors that influence attitudes toward technology (Iqbal & Bhatti, 2017; Jeno, Vandvik, Eliassen, & Grytnes, 2019).

Similar to TRA, TAM assumes that computer use is determined by the M-learning effectiveness having a significant and positive impact on actual behavior. The technology acceptance model was developed to predict and explain the willingness of tertiary students to accept wireless networks. Studies on the adoption of broadband networks found that perceived usefulness significantly positively affected the attitude of using mobile wireless networks and is the determining factor of attitude (Jeno, Vandvik, Eliassen, & Grytnes, 2019; Joo, Kim, & Kim, 2016). When many scholars study information technology issues, they expand TAM and increase other possible influencing factors. Therefore, this study not only refers to the acceptance model of science and technology, but also introduces the theory of planned behavior, expecting to increase other factors that may affect tertiary students' acceptance of M-learning, in order to explore and explain the behavior of tertiary students accepting M-learning more broadly. The purpose of this study was to investigate the effects of tertiary students' M-learning acceptance, learning motivation, and self-efficacy on M-learning effectiveness.

2. Literature review

The development of wireless technology, action learning has gradually entered people's lives. Teaching within the academic system should use this new technology to assist in learning, expand learning content, and enhance learning efficiency (Tawfik, et al., 2018; Wai et. al., 2018).

M-learning can stimulate students' motivation and promote cooperation and discussion among students; teachers can also provide teaching feedback to students (Zhang, Yin, Luo, & Yan, 2017). Some scholars have suggested that meaningful knowledge has a lot to do with the situation. Can allow learners to be at the actual site (Hew, Qiao, & Tang, 2018; Wai et. al., 2018). The experience generated by the specific operations and exercises in the simulated situation is very important for the learner (Hew, Qiao, & Tang, 2018; Iqbal & Bhatti, 2017).

Past research has also found that actual on-site learning helps to enhance the knowledge and skills needed, and helps to adapt to future problems in similar situations. Therefore, having a good online teaching environment and providing students with real learning situations and effective learning strategies has become a very important research topic (Hamidi & Chavoshi, 2017; Hsu, 2016). Mobile learning focuses on the use of mobile vehicles and network technology to construct a ubiquitous learning environment, integrating traditional digital learning platform materials and activity design, and providing mobile vehicles and other mobile vehicles (Nicol, et. al., 2017; Siddiq, Scherer, & Tondeur, 2016; Shroff, Ting, & Lam, 2019).

Learners conduct individual and group activities for indoor and outdoor activities. It is important of m-learning acceptance in perceived usefulness, perceived ease of use, perceived innovation, and perceived enjoyment (Davenport, 2018; Day, 2018). The design of action learning can meet the learner's enthusiasm for actively acquiring knowledge, meeting situational learning needs, promoting learner's experience, reflecting learning, providing instant interactive learning, and achieving the integrity of teaching content (Chung, Hwang, & Lai, 2019; Hone, & El Said, 2016).

When teachers believe that the learning belief that action learning can enhance students' IT skills is higher. The learning benefit of the value-value students is better than that of the high-task students. When teachers believe that action learning can enhance students' self-efficacy in self- cognition and self-valuation. Students with high self-efficacy will have higher learning benefits when the learning beliefs of learning efficiency and IT skills are higher (Baydas, & Goktas, 2017; Chang, Liu, & Huang, 2017). A lot of evidence shows that task value and self-efficacy are the learning of students' action learning. The benefits have a significant impact (Chung, Hwang, & Lai, 2019; Hone, & El Said, 2016; Jeno, Vandvik, Eliassen, & Grytnes, 2019). As in the study, it can reflect the perceptual usefulness of task value constructs. The perceived usefulness variable has a positive correlation with the intention to use action learning(Baturay, Gökçearslan, & Ke, 2017). Some research found that the self-efficacy of student action learning has a positive impact on learning outcomes for students' learning motivation (Jeno, Vandvik, Eliassen, & Grytnes, 2019; Nikou & Economides, 2017a).

As mentioned above, the researchers assume that M-learning acceptance, learning motivation, and self-efficacy on M-learning effectiveness of the model perceived by tertiary students in Taiwan. The performance of learning benefits will be better. Computer self-efficacy affects the usefulness of perception and the usefulness of perception. Perceptual usefulness, perceived usefulness and perceived interest all influence the attitude of action learning. The attitude of action learning will positively influence the intention of use for tertiary students.

3. Methodology

3.1. Research subjects

This research took 702 tertiary students of 22 departments through a random sampling method. The respondents were students of 11 tertiary schools, which were stratified for region and educational networks. In this population, there were 6 public tertiary universities and 5 private tertiary universities.

3.2. Research design

This study employed structural equation modeling (SEM) to analyze the relationships among tertiary students' m-learning behavior uses information technology as a medium; therefore, using M-learning is an adoption of information technology, and M-learning behavior can be said to be "innovative" behavior.

This study uses the technology acceptance model to predict and explain a user's willingness to accept M-learning. At present, the use of M-learning is in an early stage of development, and a large number of technology pushes have yet to occur. The use of M-learning is not common, so the testing of M-learning effectiveness is more suitable as a dependent variable than the actual behavior. Therefore, this study does not discuss the actual behavioral facet, but the M-learning effectiveness as a predictor, and explains the user's willingness to accept M-learning.

Data were collected through a survey, which consisted of questions on demographics and multiple items for each construct in the study. Although none of the observation variables reached a normal distribution ($p<.05$), the multi-variance normal test was insignificant ($p>.05$), which demonstrated a normal distribution. According to the conditions of maximum likelihood (ML), within the most commonly used approach in SEM, one of the conditions should be a simple random sampling that meets a multi-variance normal distribution.

3.3. Research tools

The preliminary design of the questionnaire used in this study was developed based on the relevant literature and then revised according to the research topic. Scholars were then invited to help review and correct the questionnaire. The quantitative variables of this research questionnaire were taken by Likert's five point scale method: the unipolar 1 to 5 method was used for each question, respectively ranging from "strongly disagree" to "strongly agree". The "internal consistency reliability" of the test scale was tested using Cronbach's α value; a coefficient of 0.82 or more indicated the degree of credibility, and items of insignificant importance were removed. In addition to "M-learning acceptance" and "external influence", some test results had to be deleted to obtain a factor of 0.78 or more. The Cronbach's α value coefficients of the other facets were all greater than 0.81, indicating a certain degree of reliability.

4. Result

4.1. Verification of this research model

The sample of this study was mainly drawn from the network population, and the sampling time was one month; this study required participants to download the M-learning view first. Of the 923 questionnaires returned, 31 were invalid, resulting in an effective questionnaire rate of 96.64%. This study used SEM to analyze data to explore the causal relationships between study model variables. The most approximate likelihood estimation (MLE) was used to estimate the parameters, and the results were analyzed using LISREL software. Structural equation model evaluation should be based on basic fit, overall fit, and intrinsic fit.

1. Basic adaptation degree

This study first performs screening and correction mode correction of abnormal estimation values, and modifies or deletes each variable according to MOD's proposed modification indicators to improve the mode’s Interpretation ability. By repeated inspection and mode adjustment, the correction results of each facet were obtained as follows: According to the SEM confirmatory factor analysis, the influence of the observed variables X6 and X7 on the "perceived ease of use" of M-learning acceptance was not significant. The effect of variable X16 on "Perceived enjoyment" was not significant, and the effect of X31 on "Self-evaluation" of the deconstructed surface of the control belief was not significant. These variables were deleted according to the suggestion of the revised index.

2. Overall fit

According to Hair et al. (1998), the overall model fit degree can be divided into three types: the measure of absolute fit, the incremental fit (incremental), and fit measures and parsimonious fit measures. The goodness of fit index (GFI) value obtained in this study was 0.88. Research indicates that the standard GFI value is greater than 0.9, and that the recommended GFI value should be greater than 0.8. The GFI value of this study was 0.84; although it does not meet the standard, it does meet the recommended values. The adjusted goodness of fit index (AGFI) should be greater than 0.9. The adjusted AGFI obtained in this study was 0.85, indicating that the AGFI value of this study did not meet the standard. The root mean square error of approximation (RMSEA) value is recommended to be less than 0.05. The RMSEA value of this study was 0.026, which is in line with this standard. The results of the absolute fit test indicate that the model constructed in this study is adapted to the observation data. The value-added fitness indices most commonly used to evaluate the overall mode adaptation degree are the normed fit index (NFI), the non-reference fit index (Non-Normed Fit Index, NNFI), and the comparative fit index (CFI). The NFI, NNFI and CFI values of this study were 0.98, 0.99 and 0.99, respectively, all reaching a standard greater than 0.9. This shows that the overall fit of the model constructed in this study and the observation data is ideal. Simple fitness is measured as PNFI (Reduced Baseline Fit Indicator): at least greater than 0.5, and PGFI (Reduced Suitability Indicator): at least greater than 0.5. According to Table 1, the PNFI and PGFI values for this study were 0.86 and 0.73, respectively, both greater than 0.5. The results of these studies show that the model constructed in this study should be a streamlined model.

Table 1. Overall goodness of fit test results

Type of fitness	Fit index	Evaluation standard	Analysis of results not researched	Goodness of fit
Absolute fitness volume	GFI	>0.9	0.966	Acceptable
	AGFI	<0.9	0.86	Poor
	RMSEA	<0.05	0.026	Acceptable
Incremental fitness	NFI	>0.8	0.98	Acceptable
	CFI	>0.9	0.99	Acceptable
	NNFI	>0.9	0.99	Acceptable
Parsimonious fitness	PNFI	>0.5	0.86	Acceptable
	PGFI	>0.5	0.74	Acceptable

3. Intrinsic fit

Hair et al. (1998) advocate evaluating the intrinsic fit of the model from the measurement model fit. Based on the recommendations of Bagozzi and Yi (1988), this study selected the most commonly used individual project indicators to evaluate the measurement mode, as described below:

(1) *Individual item reliability:* The reliability of each measurement index reflects the degree of consistency of the measurement tool used to measure the research facets. When using the LISREL mode analysis, the reliability index of each observation variable is the R-Square value, which is determined by the Squared Multiple Correlation (SMC). The higher the SMC, the higher the reliability; conversely, the lower the weight, the lower the reliability. The SMC values of the observed variables are lower than 0.5 in the observed variables X3, X4, X5, X17 and X30, but the SMC values of most of the observed variables are greater than 0.5, indicating that the reliability of the overall measurement of the study is good.

(2) *Composite reliability (CR):* The CR value of the potential variable refers to the reliability component of all the measured variables, indicating the internal consistency of the facet index. The higher the reliability, the higher the consistency. A consistency value of 0.7 is generally considered to be the lowest acceptable level. Table 2 shows that the CR values of all potential variables are above the 0.7 standard value, indicating good facet reliability.

(3) *Variance extracted (VE) of potential variables:* VE of potential variables is a measure of the variation of each variable in the construct extraction; it is the ability to evaluate the variation of each potential variable. It can be used to examine the convergence validity of potential variables. If the VE value is high, it indicates a higher reliability and convergence validity of the potential variable, where the recommended value is 0.5 or more. As shown in Table 2, the VE of each variable in this research mode is 0.5 or more, in accordance with the recommended value, indicating that the study has good convergence validity.

Table 2. Reliability analysis table for each variable of the research model

Item	Reliability	Extraction variation
Perceived usefulness	.882	.556
Perceived ease of use	.913	.773
Perceived enjoyment	.924	.766
Perceived innovation	.904	.689
Teaching material	.891	.654
External influence	.856	.676
Self- cognition	.887	.730
Self-valuation	.814	.538
M-learning acceptance	.920	.724
Learning motivation	.846	.667
Self-efficacy	.845	.688
M-learning effectiveness	.919	.734

4.2. Mode explanation

This study used LISERL software for the model validation and inspection of the sample selection estimation method. Table 3 shows the parameter values after the model estimation using the software. Before the model's goodness of fit evaluation, it first needed to be inspected to see if any violation of estimation existed or whether the estimated coefficient was beyond the defined scope. Based on the inspected violation of estimation, the estimated parameters in this study were all positive in the error variance, and no negative values existed. The standardized coefficients were all between 0.02 and 0.92. The estimated parameters of the data in this study did not have a violation of the estimation problem and were ready for the goodness of fit test. If a value was greater than the absolute value of 1.95, then it indicated that the estimated parameters had already reached a significance level of .05 (Hair, Anderson, Tatham, & Black, 1998). Table 3 shows that, apart from $\lambda 1$, the other estimated parameters in this study all reached a significant level.

Table 3. Tests of variables' means, standard deviations and normal distributions

Parameter	Standardize d coefficient	Standard error	t value	Parameter	Standardized coefficient	Standard error	t value
λ1	0.571	0.201	4.768*	δ1	0.341	0.046	6.459*
λ2	0.304	0.202	4.644*	δ2	0.763	0.085	9.454*
λ3	0.568	0.115	5.102*	δ3	0.634	0.027	8.874*
λ4	0.582	0.124	7.324*	δ4	0.556	0.029	9.223*
λ5	0.641	0.121	9.025*	δ5	0.483	0.022	8.349*
λ6	0.896	—	—	δ6	0.177	0.015	3.560*
λ7	0.932	0.131	9.741*	ε1	0.145	0.020	4.676*
λ8	0.671	0.017	9.455*	ε2	0.523	0.027	8.911*

Note: Refer to indices in Table 1; * p <.05.

The normalization coefficient in the structural equation model is like the beta weight of the regression. The larger the coefficient, the greater the importance in the causal relationship. It can be seen that among the eleven hypotheses of the research model, the remaining eight hypotheses reach a significant level. In the structural mode of Figure 1, the direct effect between the variables is clearly presented.

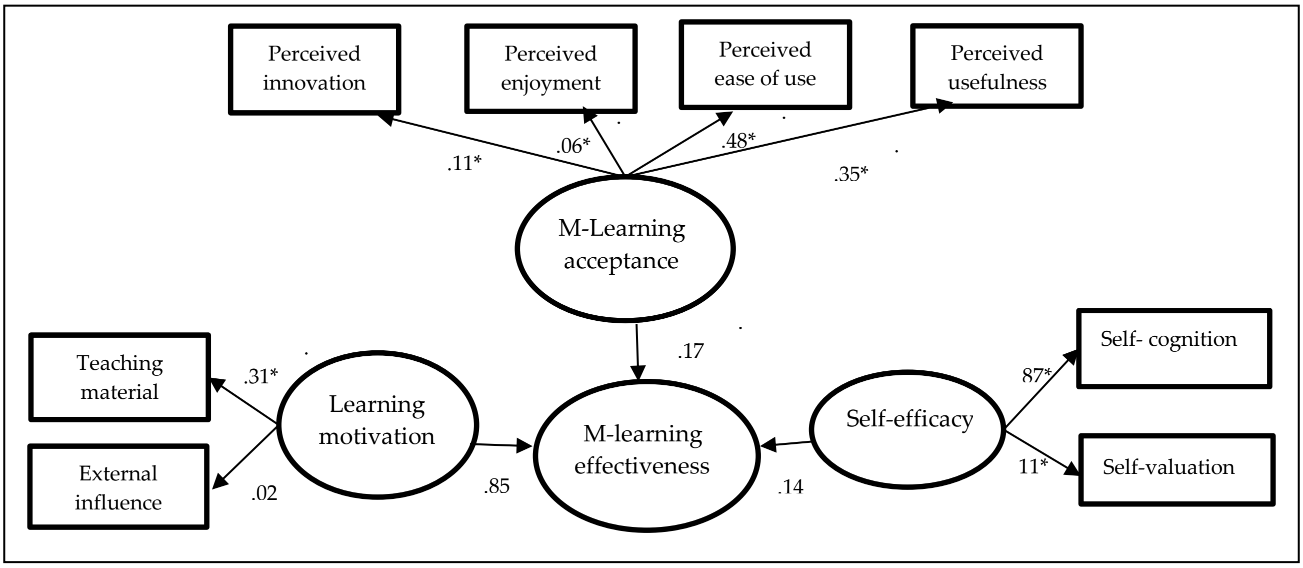

Fig1. Model of tertiary students' M-learning effectiveness

5. Conclusion

5.1. "M-learning acceptance" is the most important factor affecting "M-learning effectiveness", followed by "learning motivation" and finally "self-efficacy"

From the research results, among the factors affecting "M-learning effectiveness", the most important was "M-learning acceptance". In terms of whether M-learning can be used as the method adopted by tertiary students, the first consideration is the evaluation by, and feelings of, tertiary students about using M-learning, followed by the impact of the surrounding reference groups, and finally whether a learning infrastructure has the ability and resources to adopt M-learning. The "perceived enjoyment" assumption of "M-learning acceptance" is established; it has the most significant positive impact in fact. It can be seen that for tertiary students, the most important concern is whether the learning habits and needs of individuals are related to M-learning. The "perceived usefulness" hypothesis of "M-learning acceptance" is established, and has a positive influence. It can also be seen that the effect obtained by M-learning can be more or less similar to that obtained by ordinary early readers. The tertiary students gave a positive evaluation of M-learning. "Perceived innovation" is a hypothesis that "M-learning acceptance" is established and has a positive impact. This means that individuals who have a desire for new things or new technologies naturally have a positive perception of them, and are quick to adopt them (Chung, Hwang, & Lai, 2019;Jeno, Vandvik, Eliassen, & Grytnes, 2019). The situation of eagerness and sorrow may occur. "Perceived ease of use" does not support the assumption of "M-learning acceptance". The reason for this may be that the downloaded M-learning program required by the researcher is very simple, so it is not possible to say whether the impact is significant; users who use M-learning to generate good feelings are aware of the ease of use of M-learning, so this study cannot objectively claim that "perceived ease" significantly affects "M-learning acceptance".

5.2. "Teaching material " supports the hypothesis of "learning motivation" and verifies the theory of innovation diffusion.

Research indicates that the initial adoption of M-learning is still subject to many uncertainties. Potential users must be encouraged to seek the opinions of others to understand the adoption process of M-learning. Compared to external information, tertiary students place greater value in advice provided by their friends. Therefore, relevant industry develops promotion programs for this feature, and can launch an M-learning program offering access to friends of the tertiary students, so that M-learning can be broadcast to attract others to read and achieve the publicity effect (Al-Emran, Mezhuyev, , & Kamaludin, 2018b; Buabeng-Andoh, 2018).

5.3. The impact of “External influence” on “Learning motivation” is not significant

It can be seen that tertiary students trust information conveyed by people with whom they are familiar more than information conveyed by TV media and Internet word of mouth. "External influence" holds the assumption of "self-efficacy", which means that when students perceive their confidence and ability to adopt M-learning, the resources needed to adopt M-learning behavior are controlled (Al-Emran, Mezhuyev, & Kamaludin, 2018a; Hao, Dennen, & Mei, 2017).

5.4. “Self-evaluation” does not hold the assumption of “self-efficacy”

The reason for this may be that tertiary students cannot evaluate the resources required for M-learning, or the current resources required for M-learning, such as the Internet, pose no barrier to access to the students; that is, the students do not feel that they have a higher M-learning simply because they have the resources to use M-learning. The control of learning makes this hypothesis impossible (Harchay, Cheniti-belcadhi, & Braham, 2017; Jeno, Vandvik, Eliassen, & Grytnes, 2019).

6. Application

To date, discussion on the acceptance of new information technology has mostly adopted the Technology Acceptance Model. This study uses the technology acceptance model theory to explore the factors of users' adoption of M-learning from the new information technology perspective, and also has a good explanatory power (R2 = 79%). In this study, taking into account all the influencing factors, the authors hoped to offer a complete discussion on the factors influencing users' adoption of new information technology behaviors. In addition, the research found that five factors: "perceived usefulness", "perceived enjoyment", "perceived innovation", "teaching material " and "external influence" cannot be ignored in the study of M-learning. Effective control of the factors that significntly affect the use of M-learning by tertiary students is therefore necessary. On the above factors, this study verifies that "perceived innovation" has a significant effect on "M-learning acceptance", indicating that users who like to experience new technology or new types of things are less likely to reject M-learning.

7. Future research recommendations

Many different education systems are available in today’s market. M-learning, and the factors influencing tertiary students’ acceptance of M-learning will also vary according to the type and system, which can be further explored by follow-up research. In addition, because there are few tertiary students who have real experience in M-learning, this study does not explore the actual behavior of tertiary students. However, the M-learning method will inevitably become a trend in the future, and follow-up research may employ more research samples. A group discussion with tertiary students who have studied M-learning and tertiary students who have not studied M-learning, or the involvement of tertiary students in the M-learning topic including future research variables will make the research related to M-learning behavior more complete.

Acknowledgements

This study was financially sponsored by the National Science Council, Republic of China, under Grant No. NSC NSC105-2511-S-224-001-MY3 & NSC 106-2511-S-224-001-MY3.

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International Journal of Psychology and Educational Studies, 2019, 6 (2), 77-86

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Sleep Quality and Self-compassion as Predictors of Aggression in High School Students

Murat İskender[1], Ali Haydar Şar[1], Basri Özçelik[1], Gökçe Kocaman[2], & Ahmet Yaldıran[3]

[1]*Sakarya, University,Guidance and Psychological Counselıng Department, Sakarya, Turkey*

[2]*MA, İstanbul Aydın University, Institute of Social Sciences, İstanbul, Turkey*

[3]*MA, Sakarya University, Institute of Educational Sciences, Sakarya, Turkey*

ARTICLE INFO

Article History:
Received 12.05.2019
Received in revised form 13.05.2019
Accepted 20.05.2019
Available online 26.05.2019

ABSTRACT

In the current study, the relationships between aggression, self-compassion and sleep quality of high school students have been examined. 529 high school students (66% females and 34% males) participated in the study. Data were collected from participants through using a Pittsburgh Sleep Quality Index (PSQI), Aggression Questionnaire (AQ), Self-Compassion Scale (SCS), and Descriptive Questionnaire. The predictors of aggressiveness of the variables determined by simple correlation were investigated by multiple linear regression. According to the results, there was a positive and significant relationship between aggression levels and all sub-dimensions of self-compassion and sleep quality. In addition, it was observed that the levels of aggressiveness were significantly predicted by the sub-dimensions of self-compassion and sleep quality, and that the first three most effective predictive variables were over-identification, self-judgment and sleep quality.

Keywords:
Aggression, High school students, Self-compassion, Sleep quality, multiple regression

1.Introduction

Aggression has emerged as significant public and school health problem that include behaviors ranging from physical assaults, hate-based language, bullying to other crimes (Robers, Kemp, & Truman, 2013). Aggression is defined as intentional injurious or vandal behavior (Archer & Coyne, 2005; Bandura, 1978) and aggressive behavior intentionally causes physical and psychological harm, or distress to others (Krahé, 2013). Aggression among student is a serious psychosocial problem (Khoury-Kassabri, Benbenishty, Astor, & Zeira, 2004; Warman & Cohen, 2000), that is usually defined as relatedly hostile thoughts, angry feelings, aggressive behaviors (Buss, 1961) and low self-control capability (Özdemir, Vazsonyi, & Cok, 2013; Winstok 2009). Aggression is categorized as hostility, instrumental, indirect, verbal or physical, passive, permitted and altruist aggression (Ainsworth, 2002; Kirsh, 2006; Wiehe, 1998). Buss and Perry (1992) view aggression as a concept that is formed by elements such as "verbal aggression", "physical aggression", "anger", and "hostility", further, they approach these elements as the means of expression of aggression.

Aggressive behavior has a negative impact on both the attackers and victims. Many aggressive students show psychosocial maladaptation, low academic performance, lack of continuity to school, and various mental health problems, including various depressive symptoms (Ostrov & Godleski, 2009; Piquero, Daigle, Gibson, Piquero, & Tibbetts, 2007). Research indicates that aggression has been associated with social support (Wolff, Frazier, Esposito-Smythers, Becker, Burke, Cataldo, Spirito, 2014), music (Greitemeyer, 2011), interpersonal relationship styles (Koç, 2014), age, gender, academic success (Bacıoğlu & Özdemir 2012;

[1] Corresponding author's address: Sakarya, University,Faculty of Education, Guidance and Psychological Counselıng Department, Hendek, Sakarya, Turkey
Telephone: +902642959372
e-mail: iskender@sakarya.edu.tr
http://dx.doi.org/10.17220/ijpes.2019.02.008

Snethen & Puymbroeck, 2008), attachment (Kaplan & Aksel, 2013), emotional intelligence (García-Sancho, Salguero, & Fernández-Berrocal, 2014), irregular sleep (Lemola, Schwarz, & Siffert, 2012), sleep deprivation (Cote, McCormick, Geniole, Renn, & MacAulay, 2013; Kahn-Greene, Lipizzi, Conrad, Kamimori, & Killgore, 2006).

Sleep that is critical to health and well-being has effects on individuals' behavior and mental health (Megdal & Schernhammer, 2007; Vaughn, Salas-Wright, White, & Kremer, 2015). In general, despite to acceptance of sleep problems increased with age, the importance of sleep for the development of adolescents is ignored. (Ireland & Culpin 2006). Research also suggests a link between inadequate sleep and reduced visual and motor acuity, a number of problematic behaviours, negative effect on individuals' health and well-being, impaired memory and attention, performance and activity, cognitive deficits including slower and more variable response time (Bonnet, 2011; Preišegolavičiūtė, Leskauskas, & Adomaitienė, 2010; Vaughn et al. 2015). Research on adolescent sleep problems suggests that particular factors specifically affect adolescent sleep. These factors include early morning school schedules, earlier waking up times, social obligations, increased academic demands and delayed sleep onset (Carskadon, 1990).

Sleep problems such as poor quality sleep or lack of sleep is common among students. (Carskadon, Mindell, & Drake, 2006; Suen, Hon, & Tam, 2008). Research indicates that inadequate sleep is significantly related with aggression (Coulombe, Reid, Boyle, & Racine, 2011; Jenni & Dahl, 2007; Haynes, Bootzin, Smith, Cousins, Cameron, Stevens, 2006; O'Brien, 2009), higher impulsivity and less self-regulation (Kahn-Greeneet et al. 2006), lower optimism (Haack & Mullington, 2005), circadian rhythms (Bronsard & Bartolomei, 2013; Önder, Beşoluk, İskender, Masal, & Demirhan, 2014), and behavioural problems (Bates, Viken, Alexander, Beyers, & Stockton, 2002; Chervin, Dillon, Archbold, & Ruzicka, 2003). Apart from the sleep-related variables, aggression and self-compassion also affect adaptation, well-being and students' performance in school.

Self-compassion is an element of self-perception that is different from self-evaluative (Neff & Vonk, 2009), it is an alternative way of looking at positive self-regard (Krieger, Hermann, Zimmermannc, & Holtforth, 2015). Self-kindness, a sense of common humanity, and mindfulness have been described as three major elements of self-compassion (Neff, 2003b). Self-kindness is the tendency to be affectionate and thoughtful toward ourselves rather than being harshly critical or judgmental (Gerber, Tolmacz, & Doron, 2015). A sense of common humanity contains that a person's experiences as depending on others' experiences, and mindfulness involves keeping a balanced view on one's experiences, including negative or threatening events and related to holding emotions in non-judgmental awareness (Neff, 2003b; Adams & Leary, 2007). The process of over-identification, isolation, and self-judgment was identified with an evaluation perspective as a low levels of self-compassion by Neff and colleagues. (Barry, Loflin, & Doucette, 2015).

Research indicates that self-compassion has been associated with greater life satisfaction, social connectedness (Neff, 2003a), curiosity, happiness, positive effect, agreeableness and conscientiousness (Neff, Rude, & Kirkpatrick, 2007), adaptive functioning (Neff, 2004), self-efficacy (Iskender, 2009), well-being (Neff, Pisitsungkagarn, & Hsieh, 2008), social supports, and academic success (Conway, 2007). However, self-compassion demonstrated significant negative correlations with aggression (Barry et al. 2015).

Aggression is affected by many factors and some are related to individual differences. Predicting the impact of individual differences on aggression can be valuable for education and psychology practices. We have assumed that aggression is associated with sub-dimensions of self-compassion and sleep quality. However, no study was found in the literature that investigates the relationship between these variables. Therefore, the main purpose of the present study is to investigate the relationships between aggression, sleep quality, and self-compassion for the first time in the Turkish high school population. We also hypothesized that self-compassion and sleep quality are the predictors of aggression.

2. Method

In this study, it is aimed to investigate the relationship between aggression status, sleep quality and self-compassion in high school students. In this respect, the study is a quantitative study and a relational research design. Relational research patterns are used to determine the relationship between two or more variables and their relationship level, and to predict the possible outcomes of these relationships (Creswell, 2012; Fraenkel, Wallen, & Hyun, 2012).

2.1. Participants

The study group consisted of 527 high school students. The distribution of the participants by age and gender is given in Table 1.

Table 1. Frequency and Percentage Distribution of Students in the Study Group by Age and Gender

			F		%	
Gender	Female		347		66	
	Male		180		34	
Age	14	15	16	17	18	Total
Female	19	173	75	65	15	347
Male	8	88	43	33	10	182
Total	27	261	118	98	25	529

2.2. Data Collection Instruments

In order to collect the data, Self-compassion Scale, The Pittsburg Sleep Quality Index and Aggression Questionnaire were used.

2.2.1. Self-Compassion Scale (SCS)

Self-compassion Scale was developed by Neff (2003b), it is a self-rated questionnaire assessing self-compassion. Turkish adaptation of this scale was carried out by Akın, Akın, and Abacı (2007). The scale includes 26 items on sub-dimensions such as self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification. In the adaptation study, the internal consistency coefficients of the scale for sub-dimensions were 72 and .80, and test-retest reliability coefficients were found between .56 and .69. In the current study, the internal consistency coefficient for dimensions is between .68 and .71 and .72 for the whole scale. SCS is a Likert-type scale with items scored between 1 and 5 from strongly disagree to strongly agree.

2.2.2. Pittsburgh Sleep Quality Index (PSQI)

The Pittsburg Sleep Quality Index (PSQI) is a self-rated questionnaire assessing sleep quality and this scale was developed by Buysse, Reynolds, Monk, Berman, and Kupfer (1989). There were 19 items containing seven components (subjective Sleep Quality, sleep-onset latency, sleep duration, sleep efficiency, sleep disturbances, use of sleeping medications, and day time dysfunction). The seven subscale scores are added together to create a global sleep quality score. Global PSQI scores range from 0 to 21 and 5 and higher scores indicating sleep disturbance (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). Turkish adaptation of this scale was carried out by Ağargün, Kara, and Anlar (1996) and they reported the internal Consistency coefficient of the scale was .80; in the current study, it was .61.

2.2.3. Aggression Questionnaire (AQ)

The Aggression Questionnaire (AQ) developed by Buss and Perry (1992) was used to assess aggression. This questionnaire measures physical aggression, verbal aggression, anger, and hostility. Responses are given on a 5-point scale from extremely uncharacteristic of me to extremely characteristic of me. Higher scores refer to higher levels of physical aggression, anger, hostility and verbal aggression. The scale was adapted into Turkish by Madran (2013) and it was reported the internal Consistency coefficient of the scale was .85; in the current study, it was .86.

2.3. Statistical analysis

In this study, simple correlation analysis was used to determine the relationship between aggression, and self-compassion and sleep quality. In addition, multiple linear regression analysis was used to determine whether the aggression levels of high school students were predicted by sleep quality and self-compassion. SPSS 24 package program was used for analysis.

3. Results

The relationship between aggression levels of the 527 high school students and the level of self-compassion and sleep quality was examined by simple correlation analysis. The descriptive statistics of the variables examined in Table 2 and the correlation values of the variables are given in Table 2.

Table 2. Correlation Values Showing the Relationships between Arithmetic Mean, Standard Deviation and Variables Regarding Information Obtained from Aggression, Self-compassion and Sleep Quality Scales

Variables	A	1	2	3	4	5	6	7
Agression (S)	-							
Predictive variables								
1.Self-compassion	.17*	-						
2.Self-judgment	43**	.13*	-					
3.Common humanity	.15*	.55**	.17**	-				
4.Isolation	.40**	.11*	.63**	.13**	-			
5.Mindfulness	.12*	.65**	.16*	.56**	.10*	-		
6.Over-identification	.44**	.14*	.62**	.17**	.66**	.19**	-	
7.Sleep Quality	.25**	-.09*	.20**	-.18*	.20**	-.13*	.16*	-
Mean	84,36	14.23	13.02	10.88	11.50	11.55	11.40	7.61
Standard deviation	18,76	4.32	4.87	3.61	3.99	3.67	3.94	3.19

** p < .001.,* p< .01.

When Table 2 is examined, it is seen that there are statistically significant relationships between aggression and all subscales of self-compassion and sleep quality.

It was found that there is a low positive level of self-indulgence (r = .17, p <.01), a moderate positive level of self-judgment (r = .43, p <.001), a low positive level of awareness of awareness of sharing (r = .15), a moderate positive level of alienation (r = .40, p <.001), a low positive level of consciousness (r = .12, p <.01) and a moderate positive level of (r = .44, p <.001) over-identification, relationship between aggression and above-mentioned sub-dimensions of self-compassion. When the relationship between aggression and sleep quality was examined, it was found that the relationship between these two variables was low and positive (r = .25, p <.001).

Multiple linear regression analysis was used to investigate whether aggression levels of high school students were predicted by self-compassion sub-dimensions and sleep quality. The fact that the correlations of the independent variables with the dependent variable are significant and the relationship between the independent variables is not higher than 0.80 provides evidence that regression analysis can be performed on these variables (Büyüköztürk, 2006).

In addition, Variance Increment Factor (VIF), Tolerance Value and State Condition index (CI) values were examined in order to control the hypothesis of multiple correlation assumptions from the basic assumptions of multiple regression analysis. The results are given in Table 3.

Table 3. Coefficient Table for Multiple Correlation Assumptions

	(VIF)	TI	(CI)
Constant			1.000
Self-kindness	1.925	.519	5.964
Self-judgment	1.926	.519	7.298
Common humanity	1.649	.606	12.254
Isolation	2.100	.476	13.148
Mindfulness	1.937	.516	14.486
Over-identification	2.063	.485	14.914
Sleep Quality	1.067	.937	16.398

It is expected that the value of Variance Increase Factor (VIF) being examined for multi-correlation assumption is less than 10, Tolerance value is greater than 0.00 and the State condition index (CI = Condition Index) is less than 30 (Hair, Black, Babin, Anderson & Tatham, 2006; Tabachnick, Fidell, & Osterlind, 2001; Uyanik & Guler, 2013). When examined in accordance with all these limits, it was found that the data set used in the study did not have multiple correlation problems and the data were suitable for multiple linear regression analysis. Table 4 shows the results of multiple linear regression analysis with the related variables.

Table 4. Predictive Level of Self-compassion and Sleep Quality

Variables	B	Standart Error	B	t	p	r	Partial r
Constant	46.540	3.672		12.676	.000		
Self-kindness	.035	.226	.008	.155	.877	.007	.006
Self-judgment	.753	.201	.196	3.749	.000	.162	.141
Common humanity	.342	.251	.066	1.364	.173	.060	.051
Isolation	.449	.256	.096	1.754	.080	.077	.066
Mindfulness	-.006	.268	-.001	-.024	.981	-.001	-.001
Over-identification	1.010	.257	.212	3.932	.000	.170	.148
Sleep Quality	.947	.228	.161	4.152	.000	.179	.156
F(7-519)= 26.854		p= 0.00		R= .516		R^2=.266	

The multiple regression analysis was used to reveal how self-kindness, self-judgment, consciousness- on-awareness of sharing, alienation, consciousness, over-identification and sleep quality variables, which are thought to have an effect on the aggression levels of high school students predicted the level of aggression, and self-compassion sub-dimensions and sleep quality were found to be the significant predictors of aggression (F(7-519)= 26.854 p<0.01).

These variables and the level of aggression of high school students is 27% (R^2 = .27). When the standardized regression coefficients were examined, it is seen that the first most effective three predictive variables of aggression are over-identification (β = .212), self-judgement (β = .196) and sleep quality (β = .161).

When the significance of the regression coefficients was analysed, it was found that the significant predictors of aggression variable were over-identification (p <0.01), self-judgment (p <0.01) and sleep quality (p <0.01). According to the results of multiple linear regression analysis, the regression equation predicting aggression is as follows: Aggression = 46.54 + 1.01 * (over-identification) + .947 * (sleep quality) + .753 * (self-judgment) + .449 * (alienation) + .342 (being conscious of the shares) + .035 * (self-indulgence) - .006 (Awareness).

4. Discussion

The aim of this study is to investigate the relationships between aggression, self-compassion, and sleep quality in Turkish High School Students. The results showed the relationship between aggressiveness and sleep quality. Aggression was found slightly correlated with self-compassion positive sub-dimensions (self-kindness, common humanity and mindfulness) and moderately correlated with negative sub-dimensions (self-judgment, isolation and over-identification). However, sleep quality was found negatively correlated with self-compassion positive sub-dimensions (self-kindness, common humanity and mindfulness) and positively correlated with self-compassion negative sub-dimensions (self-kindness, common humanity and mindfulness).

Similar results were reported in previous research (Cote et al. 2013; Coulombe et al. 2011; Jenni and Dahl 2007; Lemola et al. 2012). We also hypothesized that self-compassion and sleep quality are predictors of aggression. The multiple regression analysis was used to reveal how the variables such as self-kindness, self-judgment, common humanity, isolation, mindfulness, over-identification and sleep quality that are thought to have an effect on the aggression levels of high school students predicted the level of aggression, and self-compassion sub-dimensions and sleep quality were found to be the significant predictors of aggression.

Recent studies on aggression have shown that people with aggression were found to be associated positively with sleep insufficiency (Coulombe et al. 2011; Haynes et al. 2006; Jenni & Dahl, 2007; O'Brien, 2009), behavioral problems (Bates et al. 2002), irregular sleep (Lemola, Schwarz, & Siffert, 2012), and sleep deprivation (Cote et al. 2013; Kahn-Greene et al. 2006). The first three most predictive variables in the order of importance were found to be over-identification, self-judgment and sleep quality. The prediction of aggression by sleep quality was supported by relational research findings from previous studies (Cote et al., 2013; Ireland, Culpin, 2006).

The over-identification, isolation, and self-judgment were identified with an evaluation perspective as a low level of self-compassion by Neff and colleagues. (Barry, Loflin, & Doucette, 2015). The individual's judging and criticizing himself brutally, over-identifying one's painful thoughts and feelings were found to be related to aggression as negative aspects of self-compassion and self-judgment and over-identification such as sleep quality were found to be important predictors of aggression.

The present study has several implications for future research. Firstly, research results needed to reinforce by further studies relating to self-compassion, aggression, and sleep quality. Although there are studies on aggression in high school students (such as Cote et al. 2013; García-Sancho, Salguero, & Fernández-Berrocal, 2014; Kaplan & Aksel, 2013; Koç, 2014; Wolff et al. 2014), this study discusses the relationship of aggression in these students with sleep quality and self-compassion. In this way, sleep quality and the predominant effect of self-sufficiency on aggression are also revealed. The predominant effect of sleep quality and self-compassion on aggression has been also revealed.

There are some limitations in this study. First, most of the students indicated that they have a low sleep quality. This condition may affect reported results. Second, the participants are high school students and study results are difficult to generalize to other student groups. Third, the data is limited to the declaration of the students. For this reason, it can be advisable for researchers to repeat the study with larger groups of students and at different levels of learning.

This study has also several implications for prevention of aggression. Aggression negatively affects students' daily routines, school performance and relationships with family and friends. Therefore, it is suggested that mental health professionals and educators should develop interventional strategies for preventing aggression.

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