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# Technology integrated guided inquiry-based learning approach and pre-service mathematics teachers' attitude towards learning geometry

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## ABSTRACT

The study investigated the effects of technology-integrated guided inquiry (TGIBL), guided inquiry (GIBL), and traditional (TRAD) strategies on pre-service mathematics teachers' attitudes towards geometry in college of teacher educations. The study employed nonequivalent quasi-experimental design with two experimental groups and control group. A three-stage sampling method was used. The experimental groups were exposed to TGIBL (n=48) and GIBL (n=38), while comparison group (n=30) with TRAD approach. The geometry attitude scale (GAS) questionnaire was the instrument employed to collect data from 116 PSMT. A one-way analysis of covariance, multiple comparison test and paired sample t-test were used to analyze data. The results of the study revealed that pre-service mathematics teachers who were exposed to the TGIBL had gained positive attitudes towards learning geometry than their counterparts exposed to the GIBL and TRAD, respectively. Moreover, the group taught with GIBL also shown to have a statistically significant difference with TRAD on attitude. Similarly, paired sample t-test also favored post-test score. Based on the results, TGIBL and GIBL approach should be embraced in the college of teacher educations to reinforce favorable attitudes towards learning geometry among pre-service mathematics teachers.

**Keywords:** technology-integrated guided inquiry, guided inquiry, attitude, geometry

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## INTRODUCTION

Throughout history, geometry has been an important subject in the mathematics curriculum. It is a subject that provides skills such as logic, deductive reasoning, analytical reasoning, and problem-solving skills. In addition, geometry is a mathematical concept associated with other fields of mathematics such as measurement, algebra, calculus, trigonometry, etc. and is also employed by architects, engineers, physicists, and many other professionals. According to Fyfe et al. (2015), the lack of geometric ideas is the primary reason why students have trouble understanding mathematics. As a result, researchers stated that learners' mathematical learning abilities are highly correlated with geometric understanding (Atebe & Schafer, 2008, 2011; Clements et al., 2018; Hannafin et al., 2008).

The learning competency of mathematics and geometry is determined by factors such as attitude, instructional approaches, and teachers' content knowledge (Kilpatrick et al., 2001; Mazana et al., 2019; MOE, 2013). Attitude is considered to be a crucial contributor to higher or lower mathematics and geometry performance (Mohamed &

Waheed, 2011; Ngussa & Mbuti, 2017). An attitude is a positive or negative disposition towards an object, circumstance, concept, and/or event (Mensah et al., 2013). As a result, attitude must be assessed in order to explain variability in learners' mathematics and geometry understanding. According to Mohamed and Waheed (2011), the PSMTs' attitude toward geometry is a well-established factor that determines their geometry achievement and their future career in schools. In addition, Guner (2012) and Tapia and Marsh (2004) revealed that attitude towards geometry plays an important role in determining achievement in geometry. PSMTs' thoughts about the nature of mathematics learning and attitudes have a significant impact on their future teaching practices (Cooke, 2015).

From multiple viewpoints, researchers have suggested the existence of different components of attitudes. Davadas and Lay (2017), for example, suggested motivation, enjoyment, self-confidence, and value as components of attitudes. Likewise, Mullis et al. (2020) used enjoyment, confidence, and like as components of attitude. Similarly, attitude and its dimensions of attitude towards geometry, such as self-confidence, value, enjoyment, and motivation, have been examined and considered in this study (Syveda, 2016; Tapia, 1996). According to

Atanasova-Pachemska et al. (2015), a positive attitude toward geometry shows positive confidence, enjoyment, value, and emotional disposition, while a negative attitude toward geometry reflects negative confidence, value, enjoyment, and emotional disposition. Therefore, PSMTs' attitudes toward geometry can be defined as their inclusive evaluation of geometry.

*Self-concept* (SCG) is PSMTs' confidence and self-concept of their performance in mathematics (Tapia, 1996). Self-confidence of PSMTs in geometry learning is defined by views that include beliefs about one's own ability to learn and perform well in subject matter (Adelson & McCoach, 2011). In a study by Gresham (2017), it was revealed that a lack of confidence is the main obstacle to PSMTs advancing in their courses.

*Value or usefulness* (VG) is PSMTs' beliefs about the usefulness, relevance, and worth of mathematics in their lives now and in the future (Tapia, 1996). PSMTs' attitudes towards geometry depend on their perceived usefulness or value. According to Syeeda (2016), PSMTs will be driven to study, practice, and master geometry if they see its importance in real-life.

*Enjoyment* (EG) is the degree to which PSMTs enjoy working with geometry and how much PSMTs enjoy geometry classes in general (Tapia, 1996). Enjoyment in geometry is the extent to which PSMTs like doing and learning geometry (Kupari & Nissinen, 2013). PSMTs' enjoyment while learning can influence their behavior or cognitive aspect of attitude (Syyeda, 2016).

*Motivation* (MG) is PSMTs' interest in geometry and the desire to pursue further studies in mathematics and geometry (Tapia, 1996). Motivation in this study is related to both interest and the desire to learn geometry (Guy et al., 2015). PSMTs are motivated to learn geometry if they have the desire to do so after finding learning geometry interesting. Motivation is assumed to be the driving factor behind learning (Yunus & Ali, 2009).

According to Russo and Russo (2019), PSMTs can learn geometry more effectively if they are self-directed and use an inquiry-based method to analyze or explore geometry conceptual understanding. In addition, Tsao (2018) found that using a constructivist instructional strategy increased PSTs' attitudes towards geometry (with subscales of usefulness, confidence, and enjoyment). Moreover, PSMTs' attitude towards geometry learning will be improved by using innovative teaching and learning techniques that use technology and inquiry aspects (Gambari, 2010; MOE, 2013).

To this effect, instructional methods have a considerable impact on PSMTs' attitudes towards learning geometry and mathematics. The technology-supported approach to teaching geometry enhances PSMTs' attitude towards their learning. Using technology-integrated guided inquiry-based learning (TGIBL) and guided inquiry-based learning (GIBL) approaches to improve PSMTs' attitude toward geometry is one method.

Technology (such as Geometric Sketchpad (GSP), GeoGebra, Cabri, etc.) integrated with a GIBL approach has an implication for improvement in mathematics education (Getenet, 2020; Pfeiffer, 2017; Saha et al., 2010). In addition, GIBL is a student-centered teaching strategy that addresses low motivation for learning via providing meaningful learning opportunities (Maaß & Artigue, 2013). GIBL, in particular, is a more effective learning strategy than unguided inquiry (Lazonder & Harmsen, 2016; Minner et al., 2010).

## Statement of the Problems

Ethiopia has had alarming rates of underachievement in mathematics and geometry among learners at all levels of schools (Kasa, 2015; MOE, 2017, 2018). For instance, the Ethiopian National Learning Assessment (ENLA) stated that learners' mathematics and geometry performance remained constantly poor, with mean scores far below the national average (50%) (MOE, 2012, 2017, 2018).

According to MOE (2015), teaching strategies that give PSMTs with multiple representations have the ability to change their attitude towards geometry learning. As a consequence, the MOE (2018) curriculum framework for primary pre-service mathematics teachers (PSMTs) has been recommended as an active student-centered approach with technology-supported classrooms. However, research indicates that teachers in Ethiopian teacher education colleges (CTEs) continue to use traditional teacher-centered approaches (Bekele, 2018; MOE, 2015; Semela, 2014). Thus, it appears that the way mathematics, particularly geometry, is learned and taught in Ethiopian classrooms determines their attitudes. Furthermore, according to Clements and Sarama (2011), PSMTs are influenced by a lack of an appropriate instructional approach and an attitude towards geometry.

In line with this, technology-integrated teaching methods can influence mathematics education and promote student-centered learning approaches and improve learners' attitudes (Saha et al., 2010; Tsao, 2018; Usman et al., 2019). However, in Ethiopia, technology-integrated instructional approaches are rarely applied in geometry and mathematics teaching in CTEs, and it remains an open question (MOE, 2012, 2015, 2018).

Currently, there are not many technology-based instructions to support PSMTs in the transfer or discovery of knowledge in geometry (Hathaway & Norton, 2018). Therefore, the educational value of such technology-integrated instruction and teacher-directed inquiry approaches has been neglected, and its impact on PSMTs' attitudes has yet to be addressed (Simegn & Asfaw, 2018).

In Ethiopia, since CTE prepares PSTs in mathematics for primary schools, it's significant to look into their attitude towards geometry learning in terms of self-concept, motivation, enjoyment, and value. Therefore, in this study, the researchers investigated the effects of the GIBL approach and the TGIBL approach on PSMTs' attitudes towards learning geometry in Oromiya CTEs.

## Objectives of the Study

The objective of the study was to investigate the effect of GIBL approach and TGIBL approach on PSMTs' attitude towards learning geometry. The specific objectives of the study are:

1. To explore whether there is a significant difference in PSTs' attitude toward geometry by using TGIBL approach and GIBL approach.
2. To examine the attitude and components of attitude of those students taught with TGIBL approach and GIBL approach.

The research questions that directed the research are, as follows:

1. Are there significant mean differences of post-attitude (with its dimension of attitude) between the groups?
2. Are there significant mean differences between pre- and post-attitude (with its dimensions) of the group?



**Table 1.** A nonequivalent control group quasi-experimental design

Group	Intervention		
EG1	Pre-test	X <sub>1</sub>	Post-test
EG2	Pre-test	X <sub>2</sub>	Post-test
CG	Pre-test	-	Post-test

Note. EG: Experimental group; CG: Control group; X<sub>1</sub>: Technology integrated guided inquiry approach; & X<sub>2</sub>: Guided inquiry approach

## RESEARCH DESIGN

In this study, a pre-test-post-test nonequivalent quasi-experimental design was employed. According to Creswell and Plano Clark (2011), if random assignment of participants is not possible, a quasi-experimental design is preferable (Table 1). This occurs when participants are grouped into intact classes within schools and are expected to have comparable features. The pre-test provides a baseline against which the treatment's effects can be compared, as well as a way to check for group homogeneity (Edmonds & Kennedy, 2016).

### Population, Sampling Procedure, and Samples

The population of the study consists of all second year PSMTs from CTEs in Oromiya Regional State (Department of Mathematics, 2019) who had been registered for Math-111 (plane geometry) during the 2019/2020 academic calendar. A total of 116 PSMTs, ranging in age from 19 to 26, were participated. The reason for choosing year two PSMTs is that Math-111 (plane geometry) is delivered at this level.

The study was employed a three-stage sampling method. To begin, two CTEs (i.e., Dambi Dollo CTE and Shambu CTE) were chosen using purposive sampling depending on equivalence in computer laboratories, academic and ICT facilities, candidate enrolment, and similarity in location. According to Fraenkel and Wallen (2006), the purposive sampling strategy is used to select participants who the researchers believe will provide the relevant data based on some reasonable conditions. Then, simple random sampling was used to assign these colleges into experimental and control groups. In this case, Dambi Dollo CTE was assigned into experimental site while Shambu CTE assigned into a comparison. Finally, the intact class from the Dambi Dollo CTE was assigned to one of the two experimental (TGIBL, and GIBL) using a simple random sampling procedure.

The first experimental group from Dambi Dollo CTE (EG1) (#TGIBL=48) used a TGIBL approach, while the second experimental group (EG2) (#GIBL=38) utilized a GIBL approach, and the comparison group from Shambu CTE (#Comp=30) used a traditional lecture approach.

### Data Collection Instrument

The geometry attitude scale (GAS) was used as the major data collection instrument. The GAS questionnaire was adapted from Tapia and Marsha (2004) and Utley (2007). The GAS has a five-point Likert-scale with four sub-dimensions: SCG, VG, EG, and MG. It consists of a total of 28 items. All statements were rated, 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree, with negative items being assigned values in the reverse order.

### Validity and Reliability

Validity and reliability are the two vital dimensions used to measure and assess instruments (Tavakol & Dennick, 2011). Validity describes how well an instrument captures the desired result. According to

**Table 2.** Reliability coefficients for the GAS towards geometry learning

Attitude & its dimension	Cronbach's alpha	Criteria
Self-concept (SCG) (eight items)	.76	Reliable
Value (VG) (seven items)	.89	Reliable
Enjoyment (EG) (seven items)	.71	Reliable
Motivation (MG) (six items)	.77	Reliable
<b>Attitude (AG)</b>	<b>.90</b>	<b>Reliable</b>

Tavakol and Dennick (2011), validity is the degree to which a tool, like a test or questionnaire, measures what it is designed to assess. Reliability is the consistency of scores or the degree to which participants' and/or raters' scores are error-free (McMillan, 2012). A pilot study was carried out to evaluate the validity and reliability of the instrument.

The validity of each instrument was checked using face validity and content validity. It was checked by supervisors from the college of teacher education and PhD candidate colleagues to ensure face and content validity. After experts' review, the original 40-item scale adapted was modified and reduced to 32-items.

Similarly, to estimate reliability, the GAT item was piloted with number of 60 PSMTs selected from Fitcha CTE who were completed the course Math-111. The pilot study further found four items with low inter-item correlation, and they were deleted. Hence, a scale consisting of a total of 28 items was used to measure attitude towards geometry learning. It consists of four subscales: self-concept, value, enjoyment, and motivation. Therefore, for the actual study, 28 item were used with an acceptable reliability coefficient. The Cronbach's alphas for each dimension are at an acceptable level (Fraenkel & Wallen, 2006). Table 2 shows the Cronbach's alpha coefficients of the instrument.

### Procedure of Data Collection

GAS was administered as pre-tests to both experimental groups and comparison groups before to the implementations of the interventions. The PSMTs were given 15-20 minutes to complete the GAS items.

An initial instructor was assigned to the experimental groups to facilitate the intervention. The teacher educator has a master's degree in mathematics and has taught mathematics for 14 years in the college of teacher education. In addition, he has skills in how to use Geometric Sketchpad (GSP), GeoGebra, and YouTube video lessons, which are all free open source. For the purpose of the interventions, one-week training was given to mathematics teacher who was assigned for interventions on how to implement a TGIBL approach and GIBL approach based on 5E lesson.

After completing the training on intervention materials, implementation of the intervention was started. The intervention was lasted for ten weeks. The classes in the experimental groups and control group were used four hours to deliver the course. In addition, PSMTs in all groups were used the same course materials (plane geometry/Math-111), which had the same course description, course purpose, credit hour, and course outline. In the following, general explanations on the activities of intervention are given.

### Comparison group instruction

The researchers only discussed with the classroom teacher about how to deliver the pre- and post-test and how to gather and arrange the data. The teacher has a master's degree with 12 years of teaching experience in a teacher education college. Before the classroom started, PSMTs were given course outlines and modules. Teaching through presentation (direct instruction, which is the presentation of academic

**Table 3.** Mean, standard deviation (SD), skewness, and kurtosis, Levene's test on GAS pre-test score

Dependent variable	Group	n	Mean	SD	Skewness	Kurtosis	Levene's test	
							F	P
Pre-AG	EG1	48	2.98	.38	.797	-.455	1.32	.27
	EG2	38	3.06	.32	-.303	-.902		
	CG	30	2.74	.29	.014	-.666		
Pre-SCG	EG1	48	2.87	.49	-.104	-.243	1.03	.36
	EG2	38	2.95	.54	-.026	-1.340		
	CG	30	2.51	.49	-.495	-.600		
Pre-VG	EG1	48	3.14	.46	.546	.009	.91	.41
	EG2	38	3.08	.51	.434	.156		
	CG	30	2.77	.61	-.026	-.056		
Pre-EG	EG1	48	3.03	.56	.263	-.489	2.60	.08
	EG2	38	2.91	.53	-.010	-.515		
	CG	30	2.91	.41	1.006	1.658		
Pre-MG	EG1	48	2.91	.63	.500	-.263	2.11	.13
	EG2	38	3.10	.51	-.186	-.870		
	CG	30	2.78	.49	.490	-.264		

content to PSMTs by teachers, such as in a lecture or demonstration) was utilized. PSMTs were given notes, worksheets, quizzes, and a mid-term test on each chapter, which is a usual activity in most Ethiopian CTE classrooms. That is, PSMTs take only notes and follow the lecture passively.

#### Experimental groups instruction

The PSMTs in the experimental groups were divided into heterogeneous groups, each with five members depending on their diverse academic achievements. During the intervention, the teacher educator was to lead, facilitate, asks challenging questions, and motivate while PSMTs were cooperatively working on the activities given. The GIBL experimental group was taught in their classroom, while the TGIBL groups were taught in a computer lab.

1. *The TGIBL approach:* In this approach, PSMTs were taught geometry concepts using a technology-guided inquiry approach based on a 5E lesson plan. Accordingly, PSMTs in TGIBL used GSP-integrated geometric activities to explore and analyze geometric concepts by creating mathematical objects. In this case, PSMTs in a GSP environment can verify, explain, and discover the concepts in geometry. In addition, the teacher introduced the lesson via power point and video to provoke for opens a discussion on the lesson.
2. *The GIBL approach:* In this approach, PSMTs were taught geometry concepts using guided inquiry approach based on 5E lesson plan. The classroom teacher gives questions and facilitates working with the given questions. The PSMTs discussed and shared geometric concepts using their prior knowledge and understanding within and with members of the group by posing problems, analyzing examples, formulating conjectures, offering counterexamples, revising conjectures, and validating ideas that result in theorems. Sometimes manipulatives are used in the classroom.

Finally, the GAS, a post-test that is similar with pre-test, was given to all groups after the interventions were finished. Specific group-based activities for the groups are further explained (**Appendix A**).

#### Data Analysis Procedure

The analyses of data were conducted using parametric tests such as paired sample t-test and one-way analysis of covariance (ANCOVA) at

alpha 0.05 using SPSS Version 20. The PSMTs' pre-test scores were used as covariates in ANCOVA to identify initial group differences. Finally, a post hoc comparison using Benferroni was performed to differentiate the places of statistically significant mean differences. Before testing the hypothesis, the assumptions of quantitative data were checked (i.e., independence of the observations, normality, homogeneity of variances and homogeneity of regression) checked.

## RESULTS

The results are presented based on the research hypotheses. Before the analysis of data, the assumptions were checked. Descriptive statistics related to the pre-test (GAS) scores of PSMTs attitude towards geometry presented in **Table 3**.

From **Table 3**, since the value of skewness and kurtosis is between -2 and +2, the data on pre-attitude (its dimensions) score is normal (George & Mallery, 2010). The results of Levene's test also indicated pre-attitude and its dimensions are not significant. Therefore, the assumption of the homogeneity of the variances has been tenable (Field, 2009).

After reviewing the assumptions of parametric tests, a one-way ANOVA was employed to test the similarity between the groups before the interventions were administered. **Table 4** shows the result of the ANOVA comparison of the two experimental groups and control group on pre-test score. The analysis of ANOVA ( $F[2, 113]=7.36, p<.05$ ), ( $F[2, 113]=7.08, p<.05$ ); and ( $F[2, 113]=5.11, p<.05$ ) were significant at the 0.05 alpha level for pre-attitude, pre-self-concept, and pre-values towards learning geometry, respectively. This implies that there was a significant mean difference among the EG1, EG2, and TRAD groups before the interventions. Thus, ANCOVA was employed in the analysis of the post-test score using the pre-test score as a covariate since the groups were not equivalent prior to the interventions.

**HO[1]:** There are no significant differences in AG (its dimensions) of PSMTs who were taught geometry using TGIBL, GIBL, and traditional teacher-centered (TRAD) approach.



**Table 4.** ANOVA on pre-test of attitude (its components) on EG1, EG2, and TRAD groups

Dependent variable	Sources	SS	df	MS	F	p
Pre-AG	Between groups	1.73	2	.87	7.36	.00
	Within groups	13.32	113	.12		
	Total	15.05	115			
Pre-SCG	Between groups	3.70	2	1.85	7.08	.00
	Within groups	29.49	113	.26		
	Total	33.18	115			
Pre-VG	Between groups	2.72	2	1.36	5.11	.01
	Within groups	30.03	113	.27		
	Total	32.74	115			
Pre-EG	Between groups	.41	2	.21	.77	.46
	Within groups	29.94	113	.27		
	Total	30.35	115			
Pre-MG	Between groups	1.81	2	.91	2.89	.06
	Within groups	35.41	113	.31		
	Total	37.22	115			

**Table 5.** The descriptive statistics and of skewness and kurtosis and Levene's test and linearity test on post-AG (its dimensions)

Dependent variable	Group	n	Mean	SD	Skewness	Kurtosis	Levene's test		Homogeneity of regression	
							F	p	F	p
Post-AG	EG1	48	3.73	.27	.442	.359	.079	.924	.059	.942
	EG2	38	3.42	.26	.417	-.019				
	CG	30	3.08	.29	-.873	.372				
Post-SCG	EG1	48	3.82	.55	.152	-.642	2.779	.066	.851	.430
	EG2	38	3.50	.63	.247	-.105				
	CG	30	2.77	.41	-.737	1.772				
Post-VG	EG1	48	3.80	.51	.513	-.753	.607	.547	1.254	.289
	EG2	38	3.39	.47	-.351	.507				
	CG	30	3.28	.55	-.473	.896				
Post-EG	EG1	48	3.65	.48	.058	-.506	.229	.796	1.873	.158
	EG2	38	3.34	.54	.626	.786				
	CG	30	3.32	.54	-.263	-.540				
Post-MG	EG1	48	3.67	.47	.029	-.420	1.559	.215	1.115	.319
	EG2	38	3.49	.37	.948	1.110				
	CG	30	2.96	.42	-.317	-.246				

Before the ANCOVA analysis on post-test score, assumptions of ANCOVA (i.e., normality, homogeneity of variance, homogeneity of regression) must be tested. Table presented below give information about the mean scores, standard deviations, the values of skewness and kurtosis, Levene's tests, and homogeneity of regression on post-AG (its dimensions).

From **Table 5**, the skewness and kurtosis ranged between -2 and +2, showing that GAS post-test scores are normally distributed (George & Mallery, 2010). Since p-values are not significant for Levene's and regression, it shows the assumption of homogeneity of the variance and homogeneity of regression were not violated (Field, 2009). A preliminary analysis evaluating the homogeneity-of-regression (slopes) assumption indicated that the relationship between the covariate and the dependent variable did not differ significantly as a function of the independent variable. As a result, the assumptions for ANCOVA were tenable in this particular study.

The estimated marginal means were statistically adjusted on post-test mean scores for all groups to enable comparison between the pre-test and post-test, among the groups in their post-test. **Table 6** presents the means, adjusted mean scores, and standard deviations for the geometry attitude scores. From **Table 6**, the adjusted means on attitude (its dimensions) towards learning geometry was different among the groups.

To determine whether there were significant differences between the three groups in post-attitude (its dimensions), ANCOVA is carried out and presented in the **Table 7**. In the **Table 7**, the ANCOVA test confirmed that there was significant mean difference between the groups in post-AG ( $F[2, 112]=51.314, p=.000$ ), eta-squared ( $\eta^2$ ) .48; post-SCG ( $F[2, 112]=28.12, p=.000$ ), eta-squared ( $\eta^2$ ) .33; post-VG ( $F[2, 112]=11.69, p=.000$ ), eta-squared ( $\eta^2$ ) .17; post-EG ( $F[2, 112]=5.05, p=.008$ ), eta-squared ( $\eta^2$ ) .08; and post-MG ( $F[2, 112]=24.708, p=.000$ ), eta-square ( $\eta^2$ ) .31.

The eta-squared ( $\eta^2$ ) values .48, .33, .17, .8, and .31 for post-AG, post-SCG, post-VG, post-EG, and post-MG, respectively indicated that the interventions provided 48%, 33%, 17%, 8%, and 31% of variation, independent of the pre-test scores. The eta-squared ( $\eta^2$ ) values are shown to have larger effect size for post-AG, post-SCG, post-VG, and post-MG while moderate effect size for post-MG (Cohen, 1988).

Follow-up tests were conducted to evaluate pairwise differences among the adjusted means for groups. To determine where the difference among the teaching approaches, Bonferroni's post-hoc multiple comparison test was used. The Bonferroni was used to control for type I error (Field, 2009). The post-hoc test for the teaching condition variable was tested at the pre-established alpha level of .05. **Table 8** shows the Bonferroni post-hoc multiple comparison tests.

**Table 6.** Adjusted and unadjusted means and variability on the three groups for pre-service mathematics teachers' geometry attitudes and its components using pretest as covariate

Variables	Groups	n	Unadjusted		Adjusted	
			Mean	SD	Mean	SE
Post-AG	EG1	48	3.73	.27	3.73	.040
	EG2	38	3.43	.26	3.42	.046
	CG	30	3.08	.29	3.09	.052
Post-SCG	EG1	48	3.82	.55	3.81	.079
	EG2	38	3.50	.63	3.44	.091
	CG	30	2.77	.41	2.84	.116
Post-VG	EG1	48	3.80	.51	3.78	.076
	EG2	38	3.39	.47	3.40	.083
	CG	30	3.28	.55	3.30	.101
Post-EG	EG1	48	3.65	.48	3.65	.074
	EG2	38	3.34	.54	3.33	.083
	CG	30	3.32	.54	3.36	.096
Post-MG	EG1	48	3.66	.47	3.67	.062
	EG2	38	3.49	.37	3.51	.073
	CG	30	2.96	.42	2.96	.083

**Table 7.** ANCOVA result for geometry attitudes (its dimensions) variable

Variable	Source	df	MS	F	p	Eta <sup>2</sup>
Post-AG	Pre-attitude	1	.211	2.848	.094	.025
	Groups	2	3.793	51.314	.000	.478
	Error	112	.074			
Post-SCG	Pre-self-confidence	1	1.66	5.62	.02	.032
	Groups	2	8.188	28.120	.000	.334
	Error	112	.291			
Post-VG	Pre-value	1	.05	.193	.661	.002
	Groups	2	3.056	11.69	.000	.173
	Error	112	.261			
Post-EG	Pre-enjoyment	1	.235	.887	.348	.008
	Groups	2	1.339	5.051	.008	.083
	Error	112	.265			
Post-MG	Pre-motivation	1	.023	.126	.724	.001
	Groups	2	4.579	24.708	.000	.308
	Error	112	.185			

From **Table 8**, the post hoc multiple comparison result revealed that there was statistically significant mean difference between EG1 and CG at ( $p=.000$ ) in attitude, self-concept, value/usefulness, and motivation after the intervention with mean gain .638, .98, .534, and .702, respectively. This indicated that, PSMTs in EG1 (i.e., TGIBL approach) has improved attitude, self-concept, values, and motivation towards learning geometry than comparison group (i.e., traditional teacher-centered approach).

Similarly, there was statistically significant mean difference between EG1 and EG2 at ( $p<.05$ ) in attitude, self-concept, value/usefulness, and enjoyment with mean gain of .315, .336, .419, and .306, respectively. This revealed that PSMTs in EG1 (i.e., TGIBL approach) has gained positive attitude, self-concept, value, and enjoyment towards learning geometry than EG2 (i.e., TGIBL approach). Furthermore, the post hoc multiple comparisons showed that there was no statistically significant mean difference between EG2 (i.e., GIBL approach) and TRAD (i.e., traditional teacher-centered approach) at ( $p>.05$ ) in value and enjoyment towards learning geometry. Hence, it is evident to say that the intervention was successful in improving PSMTs' attitude towards learning geometry.

Thus, it can be concluded that technology integration into guided inquiry learning environment is more effective than both traditional

approach and guided inquiry approach in improving PSMTs attitude, motivation, enjoyment, and values towards learning geometry. The key reason is that the use of technology provided PSMTs with an innovative, exciting, and visible way of learning. Technology such as dynamic geometric software (like GSP and Geogebra) and YouTube video used within guided inquiry approach was assisted PSMTs to understand geometric concepts with concrete real-life examples through visualization. Moreover, the instant and quick feedback offered in a technological learning environment might be another factor for improved attitudes.

**H0[2]:** There is no significant mean difference of pre-test and post-test attitude (its dimension) of each group.

In order to determine whether differences in the averages scores of each groups, a paired sample t-test was applied. **Table 9** summarizes the results of the paired sample t-test analysis for the pre-test and post-test of attitude score for all groups.

**Table 8.** Bonferroni's post-hoc multiple comparisons test

Variable	(I) group	(J) group	Mean difference (I-J)	p <sup>b</sup>
Post-AG	EG1	EG2	.315*	.000
		CG	.638*	.000
Post-SCG	EG2	CG	.323*	.000
	EG1	EG2	.336*	.015
Post-VG		CG	.980*	.000
	EG2	CG	.643*	.000
Post-EG	EG1	EG2	.419*	.001
		CG	.534*	.000
Post-MG	EG2	CG	.115	.990
	EG1	EG2	.306*	.022
Post-AG		CG	.313*	.032
	EG2	CG	.007	.990
Post-SCG	EG1	EG2	.185	.160
		CG	.702*	.000
Post-VG	EG2	CG	.517*	.000
		CG		

Note. \*p<.05 & <sup>b</sup>Adjustment for multiple comparisons: Bonferroni

**Table 9.** A paired sample t-test on the pretest and posttest comparison within groups on attitude variable

Dimensions	Group	n	Paired differences			t	df	p
			MD	SD	SEM			
Pre- & post-test AG	EG1	48	.75583	.42147	.06083	12.424	47	.000
	EG2	38	.37202	.39528	.06412	5.802	37	.000
	CG	30	.18311	.66523	.12145	1.508	29	.142

Note. MD: Mean difference; SD: Standard deviation; SEM: Standard error mean; & AG: Attitude

A paired samples t-test presented in **Table 9** depicted that PSMTs' attitude to learn geometry ( $t[47]=12.424$ ,  $p<.05$ ) have significantly improved for EG1 groups and not significantly improved for the comparison group ( $t[29]=1.508$ ,  $p>.05$ ). EG2 also made a significant improvement in attitude ( $t[37]=5.802$ ,  $p<.05$ ). The result highlight that PSMTs who were learned geometry with technology supported guided inquiry approach favored to attain positive attitude towards geometry. Therefore, this shows that there is a significant difference in pre-test and post-test results in favor of the post-test. Similarly, PSMTs in guided inquiry approach showed significant mean difference in favor of post-test score.

## DISCUSSION

The current study was done to investigate the effects of the TGIBL approach, GIBL and the traditional teacher-centered approach on PSMTs' attitudes toward learning geometry in college of teacher education in Oromiya Regional State, Ethiopia. The results of the analysis of ANCOVA on the attitude of PSMTs taught geometry using a TGIBL approach, a GIBL approach, and those taught using a traditional teacher-centered method approach indicated a significant difference in favor of PSMTs taught with the TGIBL approach. The findings of the study showed that the TGIBL approach was more effective than the GIBL approach and the traditional teacher-centered approach in improving PSMTs' attitudes (motivation, self-concept, enjoyment, and value) towards learning geometry.

This finding is concurred with the findings of Abdi (2014), Cavus and Deniz (2021), Yudit (2019), and Zuiker and Whitaker (2014) who showed that technology complemented with an inquiry-based learning teaching environment improves the attitudes of PSMTs towards learning geometry. Furthermore, previous studies by Birgin and Topuz,

(2021), Demir and Onal (2021), Deringol et al. (2021), Juandi et al. (2021), and Meng and Idris (2012) found that technology-rich teaching environments have positively influenced PSMTs' attitudes towards learning geometry and mathematics. Thus, using technology (such as GSP, GeoGebra, etc.) enhanced PSMTs' engagement and motivation in learning mathematics and geometry.

Moreover, the results of this study indicated that the attitudes of PSMTs taught with the GIBL approach are significantly better than those of traditional teacher-centered groups. This finding is supported by Audu et al. (2017), who determined that through guided inquiry, PSMTs increase their confidence and develop a deep understanding of concepts. Similarly, Abaniel (2021), Albay (2020), Bodner and Elmas (2020), Tsao (2018), and Tatal and Yazar (2022) found inquiry instructional approach improved PSMTs' attitudes toward geometry.

Furthermore, the paired sample t-test results showed post-test score of attitude of the pre-service teachers who were taught with TGIBL and GIBL approach were significantly higher at the end of the course than pre-intervention. Many studies (Abdullah & Zaharia, 2013; Kutluca, 2013) show that attitudes towards learning mathematics and geometry are changed in computer-based environments. In addition, studies indicate that using concrete materials and hands-on activities improved PSMTs' attitude and level of understanding in geometry (Siew & Abdullah, 2013; Siew et al., 2013).

## CONCLUSION AND RECOMMENDATION

Based on the findings of this study, it can be concluded that both the TGIBL approach and the GIBL approach have a positive effect on PSMTs' attitudes toward learning geometry. In these approaches, abstract geometrical concepts are visualized, which motivates PSMTs to learn the subject matter. Hence, TGIBL and GIBL approaches are

more effective for teaching geometry at CTEs. The findings implied that a GIBL approach is more effective in a technology-based environment for a positive attitude towards learning geometry.

Based on the findings of the study it can be recommended:

1. Mathematics teacher educators should use TGIBL, and guided inquiry approaches so as to promote collaborative, active learning, discovery learning and motivation among PSMTs towards the subject matter.
2. Technology-assisted instruction method should be practiced for teaching and learning of geometry (mathematics) in college of teacher education.
3. In this study, the research was limited to quantitative data analysis. Thus, qualitative approaches of study, such as interviews, are recommended in order to gain an in-depth understanding of the effects of the TGIBL approach on PSMTs' attitudes towards learning geometry (mathematics) in CTEs.

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## APPENDIX A

### Sample Lesson Plan

**Previous Knowledge: PSMTs should recognize**

- The characteristics of triangle by sides and angles.
- A straight angle is  $180^\circ$  in measure.
- Alternate interior angles of parallel lines are equal in measure.

**Outlines of lesson: (summary of tasks/ activities)**

**1. Technology Guided Inquiry-Based Learning Approach**

**a) Measuring Angles (THINK-PAIR-SHARE)**

PSTs are to be arranged in group of 5 members. Each PST should draw different triangle (e.g., acute, right, obtuse, scalene, isosceles, and equilateral).

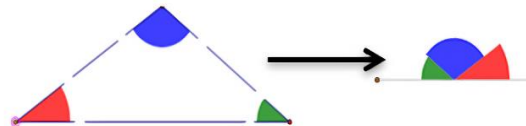
Did you get the same angle sum? If you do not get the same angle sum, discuss why?

What did you conclude about the angle sum of a triangle?

**b) Discovering with hands-on activities/methods**

**Cutout and Folding papers (THINK-PAIR-SHARE)**

On the piece of plain white paper, draw a triangle and cut out. Label the interior of each angle. Now tear of each corner of the triangles and rearrange the three "angles" so that their vertices meet at one point with no overlap.



What does this tell you about the sum of the angles in the triangle?

**c) Investigating with GSP and GeoGebra software (THINK-PAIR-SHARE)**

**GSP Applet On Plane Geometry of Angle Sum of Theorem:**

Find the sum of the interior angle measures, and then drag one vertex to create a new triangle. Find the sum again. (Repeat)

**YouTube Videos:** <https://www.youtube.com/watch?v=sth6XeNUZY&t=258s>

<https://www.youtube.com/watch?v=yRDwYYjgOY>, <https://www.youtube.com/watch?v=kajD-Wixcvo>

<https://www.youtube.com/watch?v=V81sAvmSY4M>, <https://www.youtube.com/watch?v=v5TJRUnAaw4&t=339s>

<https://www.youtube.com/watch?v=3kx6HGO6gvM>

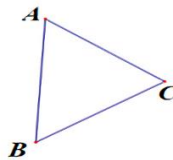
The Geometer's Sketchpad™ (GSP) (edugains.ca)

[www.edugains.ca/resources/Math/VideoLibrary/Video/TechnologicalSupports/gsp/mp4/CirclePiSupport.mp4](http://www.edugains.ca/resources/Math/VideoLibrary/Video/TechnologicalSupports/gsp/mp4/CirclePiSupport.mp4)

[www.edugains.ca/resources/Math/VideoLibrary/Video/TechnologicalSupports/gsp/mp4/SumOfAllAngles\\_Video2.mp4](http://www.edugains.ca/resources/Math/VideoLibrary/Video/TechnologicalSupports/gsp/mp4/SumOfAllAngles_Video2.mp4)

File Edit Display Construct Transform Measure Number Graph Window Help

$m\angle ABC$	$m\angle BAC$	$m\angle BCA$	$m\angle ABC + m\angle BAC + m\angle BCA$
78.29°	58.66°	43.05°	180.00°
52.43°	101.88°	25.72°	180.00°
86.03°	63.48°	30.49°	180.00°
97.94°	55.81°	26.25°	180.00°
111.64°	52.83°	15.54°	180.00°
131.32°	39.36°	9.32°	180.00°
161.30°	15.38°	3.32°	180.00°
146.03°	30.67°	3.30°	180.00°
101.10°	58.99°	19.91°	180.00°
83.70°	42.86°	53.44°	180.00°
54.21°	57.84°	67.95°	180.00°



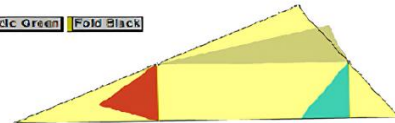
**Paper-Folding (Reflection) Approach**

The computer will fold the vertices of your triangle

1. Drag the vertices of the triangle
2. Press Reset
3. Use the Fold + Rotate

Fold Red Fold Green Fold Black

Reset



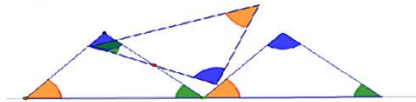
What do you conclude?

**Using Transformations to Place the Three Angles Together**

1. Drag the vertices of the triangle
2. Press Reset
3. Use the Translate and Rotate Buttons

Reset

Translate Triangle Rotate Triangle



Does it matter which order the Transformations are performed?

When the three angles of the triangle (blue, orange, green) are combined, what angle is created?

**Evaluation**

1. If a triangle has angle  $30^\circ$  and  $50^\circ$ , find the third angle?
2. If a triangle has an angle measure  $x$ ,  $4x$ ,  $5x$ , find the value of  $x$  and each of the three angles?

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# Do gender and age jointly or individually moderate the effects of cognitive and behavioral therapies on addiction to mobile phone calling behavior?

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## ABSTRACT

Mobile phone technology has gradually become a part of higher educational experience, and almost every member of the university community uses or owns a mobile phone to communicate with others. Despite the many benefits that mobile phone accrues, the excessive use of them has resulted in the problem of mobile addiction. This study examined the effects of cognitive therapy and behavioral therapy in dealing with mobile phone addiction among students. The study employed the quasi-experimental (non-equivalent) research design, with a pre-test-post-test control group. Using the stratified sampling technique, sixty participants were selected for the study. An adapted test of mobile phone dependence with McDonald's omega coefficient reliability estimates of .82 was used for data collection for both the pre- and post-test. The hypotheses were tested using a three-way analysis of covariance. Evidence from this study was that, neither cognitive therapy nor behavioral therapy was efficacious in reducing addiction to mobile phone calls among university students. It was also found that neither gender nor age moderated the effects of cognitive therapy and behavioral therapy. It was recommended that counsellors should consider other psychological therapies to reduce mobile phone call addiction.

**Keywords:** mobile phone addiction, mobile phone calling behavior, cognitive therapy, behavioral therapy

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## INTRODUCTION

A mobile phone is a portable technological gadget that aids users in making and receiving calls, text messages, among other features, notwithstanding their location. Beal (2010) defined a mobile phone as a wireless, multifaceted, portable device that helps connect to the Internet, make calls, email, text messages among others. It is usual to see both the young and the old using mobile phones in public places, colleges, universities, churches and at home. With the advent of mobile phones, the practice of writing letters to check up on friends and relatives, travelling distances to transact business and connect with people around the globe have reduced. This is because today, most people's reliance on mobile phone subscriptions which helps them connect to anyone instantaneously via the World Wide Web has swiftly surged. Studies report that most of the people in the economically developing and developed world use mobile phones (Kalba, 2008; Teo & Pok, 2003). In the early 2000s, the majority of cell phone users were from developed countries.

According to National Communication Authority (2013), 19,000 people used mobile phones in 1992 when mobile phones were

introduced into Ghana. The number of Ghanaian users in 1998 and 1999 was 43,000 and 68,000, respectively. The number surged to 24.4 million in August 2012 (Eto, 2012). Due to the rapid increase of users, it is erratic to see someone with a mobile phone. At the moment, the use of mobile phones by young people is a global phenomenon. It is no longer a technological tool but a social tool because it has virtually become inseparable in the lives of many people especially young ones.

The popularity of mobile phones among university learners can be understood for their versatility. Students frequently use it for short messaging services, phone calls, games, downloading of ringtones, picture messaging, and WhatsApp messaging. In addition, students use mobile phones to listen to music, receive videos, record conversations, make video calls, access the Internet, and use bluetooth in sharing music. These behaviors gradually condition them to the use of phones to the extent that they show symptoms of behavioral addiction. The use of the mobile phone begins to interrupt their day-to-day activities, especially academic work. While some students may experience phantom vibration or 'ringxiety' (a false belief that your mobile phone is ringing or has received a notification, even though it has not) others are likely to develop nomophobia (a situation where they experience anxiety as a result of not having access to a phone) (SecurEnvoy, 2012).

The chances are that they develop social and relationship problems as a result of their dependence on the mobile phone (Lee et al., 2014; Leung, 2008; Matusik & Mickei, 2011; Oulasvirta et al., 2012). It is also reported that many sleep with their mobile phones while checking email, Facebook, or other social network sites. Brian (2013) also reported that learners after manipulating their phones, place them under their pillow. He added that learners suffer separation anxiety when their phones are not with them. The search for identity and the enjoyment of freedom positively reinforces these behaviors. Griffiths (2000) linked behavioral addiction to non-chemical behavioral addiction which includes human-machine interaction.

According to Griffiths (2005), excessive use of mobile phones does not necessarily mean addiction. The financial cost of some applications usually differentiates pathological mobile phone usage from some forms of mobile usage. High expenditure may be indicative of mobile phone addiction. This is reinforced by James and Drennan (2005), who reported that expensive mobile phone bills are one core negative result of addictive mobile phone usage. Bratter and Forest (1985) also argued that use and addiction can be differentiated by quantitative measures rather than qualitative. Addiction is determined in terms of the effect it has on the individual's social context and not by quantity alone. Students pay much attention to their mobile phones more than any other activity. This unlimited attention and the strong urge toward mobile phone usage, the interruptions it brings in household chores and the conflict it promotes between them and their parents on the amount of time they spend on their phones are all indications of mobile phone addiction symptoms (Griffiths, 2005). The negative health impact of mobile phones on humans have been adequately documented in the research literature. Again, a lot more of the researchers have used therapeutic interventions in dealing with or managing behavioral addiction. For example, some researchers such as Malak (2018), Rizeanu (2018), Shepherd (2010), and among others have used therapeutic interventions to treat variety of behavioral addiction. Interestingly, however, many of the researchers used cognitive-behavioral therapies (CBT) for the interventions. Much as the therapeutic approach was appropriate, the researchers also desired to investigate whether each of them, that is cognitive therapy and behavioral therapy, could independently influence mobile phone call addiction among university students.

### Objectives of the Study

The main objective of the study was to determine the effects of cognitive therapy and behavioral therapy on mobile phone calling addiction behaviors of students. In addition, the study examined the moderating roles of gender and age of the participants.

### Research Hypotheses

The followings were hypothesized:

1. **H1:** There is a significant effect of (i) cognitive therapy and (ii) behavioral therapy on the mobile phone calling behavior of students.
2. **H2:** There is a significant difference in the effectiveness of (i) cognitive therapy and (ii) behavioral therapy in reducing mobile phone calling addiction of students based on gender.
3. **H3:** There is a significant difference in the effectiveness of (i) cognitive therapy and (ii) behavioral therapy in reducing mobile phone calling addiction of students based on age category.

**Table 1.** Pre-test-Post-test control group design

Treatment	Group		
	Group A	Group B	Group C
Pre-test	O <sub>1</sub>	O <sub>2</sub>	O <sub>3</sub>
Treatment	X <sub>1</sub>	X <sub>2</sub>	
Post-test	O <sub>4</sub>	O <sub>5</sub>	O <sub>6</sub>

FooterWillBeHere

## METHODOLOGY

The study employed the quasi-experimental research design, with a pre-test-post-test control group. Specifically, the non-equivalent type of quasi-experimental design was utilized. With this research design, the assignment of participants to the treatment groups was solely as a result of their membership in the intact groups, but not randomization (Leedy & Ormrod, 2010). There were three groups in the study, out of which two received cognitive and behavioral therapies separately while the remaining was the control group. The study targeted all the third-year undergraduate students in the 2019/20 academic year at the University of Cape Coast, Ghana. The cluster sampling technique was used to cluster the students into four colleges, out of which three were randomly selected using the simple random (lottery) method. For each of the three selected colleges, one department was purposively selected making three in all. The selected members of the three selected departments were assigned to the three groups, for which one group received cognitive therapy intervention, the other received behavioral therapy, and the last group was assigned the control group.

**Table 1** presents the nature of the group assignment and the schedules of treatment. For ethical reasons, pseudonyms such as group A, B, and C were used to present the selected departments. From **Table 1**, O<sub>1</sub>, O<sub>2</sub>, and O<sub>3</sub> represented pre-tests, X<sub>1</sub> and X<sub>2</sub> represented the  $f_x$  treatments that were implemented, and O<sub>4</sub>, O<sub>5</sub>, and O<sub>6</sub> represented post-tests. With this design, the experimental group's A (cognitive therapy), B (behavioral therapy) and C (the control group) received the pre-test and post-test. Only the experimental groups (A & B) were offered the treatment.

Regarding the actual participants used in the study, all the students in the three selected departments were initially surveyed using Cholz's (2012) adapted test of mobile phone dependence (TMD) instrument. A cut-off score of 25 or more out of 50 was used as the benchmark for identifying those with mobile phone calling addiction. Twenty participants were then selected from each of the three departments using the stratified sampling technique. Gender and age categories were used as the stratification variables. The twenty students were then assigned to their various groups. For both the pre-test and post-test, the validated adapted version of the TMD was used for data collection. The coefficient reliability of the (instrument) mobile phone calling behavior was .82 and this was estimated using McDonald's omega coefficient reliability. The interventions were carried out in 11 weeks. For each week, there were two meetings, which lasted for 50 minutes each.

The hypotheses were tested using a three-way analysis of covariance (ANCOVA). The study had three independent variables, namely, group, gender, and age category. The pre-test scores were used as the covariate in the model. The post-test scores were used as the dependent variable. The choice of ANCOVA was because of its ability to control for the pre-test scores which was used as a covariate. ANCOVA adjusts for the post-test scores based on the pre-test, then these adjusted post-test scores were compared.



**Table 2.** ANCOVA test for effect of cognitive therapy and behavioral therapy on students' mobile phone calling addiction behavior

Source	df	Mean square	F	Sig.	Partial eta-squared( $\eta_p^2$ )
Corrected model	18	42.574	1.040	.441	.313
Intercept	1	1304.496	31.866	.000	.437
Pre-test	1	.632	.015	.902	.000
Group	2	32.982	.806	.454	.038
Gender	1	206.753	5.051*	.030	.110
Age	2	12.437	.304	.740	.015
Group×gender	2	43.913	1.073	.351	.050
Group×age	4	13.146	.321	.862	.030
Gender×age	2	76.682	1.873	.167	.084
Group×gender×age	4	85.671	2.093	.099	.170
Error	41	40.937			
Total	60				

Note. \*Significant,  $p < .05$

ANCOVA is a powerful statistical procedure in the sense that it combines both analyses of variance (ANOVA) and regression models. This makes it robust in comparing across the groups of interest (Pituch & Stevens, 2016). The following assumptions were checked and adhered to normality, linearity, and homogeneity of regression slopes.

## RESULTS

Table 2 presents the results of the ANCOVA test on the hypotheses. From Table 2, out of 60 participants in the study, 37 (61.7%) were males and 23 (38.3%) were females. There were 18 (30%) of the participants who were within the age range of 19-22 years. Also, 31 (51.7) participants were found within the age group of 23-26 years. Only 11 (18.3%) participants were 27 years and above. From the analysis of the age distribution of participants, it was found that the majority of the participants were within the ages of 23-26 years.

From Table 2, the results of the 3 by 2 by 3 between-groups ANCOVA showed no statistically significant interaction between group, gender, and age,  $F(4, 41)=2.09$ ,  $p=.099$ ,  $\eta_p^2=.17$ . Similarly, none of the two-way interactions, whether group and gender  $F(2, 41)=1.07$ ,  $p=.351$ ; group and age,  $F(4, 41)=.32$ ,  $p=.862$ ; and gender and age,  $F(2, 41)=1.87$ ,  $p=.167$  were statistically significant. Also, the main effect of group was not statistically significant,  $F(2, 41)=.81$ ,  $p=.454$ . Based on the results of this study, there is enough evidence to uphold the null hypotheses for each of the alternative hypotheses raised. The implication is that the research hypotheses were not supported.

## DISCUSSION

The findings herein indicate that neither cognitive therapy nor behavioral therapy being used independently was efficacious in reducing mobile phone calling addiction among university students. This finding contradicts Edjah and Ankomah (2020), whose study reported a significant impact of cognitive and behavioral therapies in the reduction of mobile phone addiction in general (a behavior that cut across the broad spectrum of various mobile phone addictive behaviors and not on the mobile phone calling addiction behavior as in the case of the present study) among students. Similarly, it also contradicts Hofmann et al.'s (2012) findings that cognitive therapy helps with many of life's challenges including anxiety, depression, and addiction.

It can be argued that antecedents that reinforce mobile phone calling addiction behavior may vary depending on the kind of addictive behaviors. For instance, what makes one addicted to the Internet surfing on the phone may not be the same as getting addicted to WhatsApp usage. It is, therefore, reasonable to have the same therapies function differently for different mobile phone behaviors. Invariably from the findings, cognitive interventions such as flushing out negative thoughts and behavioral interventions like positive reinforcements to unlearn unacceptable behaviors did not influence the mobile phone calling habits of students.

From the study, there was no gender difference, age difference, nor a joint difference of the participants who received cognitive therapy and behavioral therapy, compared with those in the control group. The results imply that neither gender nor age of students moderates the effectiveness of cognitive and behavioral therapies on the mobile phone calling behaviors. Maguire and Osman (2003) study corroborate the present findings by reporting that younger people used mobile phones mostly to socially interact whereas older people regarded mobile phones as a way to assist in emergencies. According to van Deursen et al. (2015), diverse social usage, greater self-regulation and stress make older people have a lower likelihood of developing addictive mobile phone behavior. Choliz (2012) also indicated that young people become dependent on the phone because of their vulnerability.

## CONCLUSION

It can be concluded from the findings that the treatment of mobile phone calling addiction with the use of either cognitive therapy or behavioral therapy was not effective with students. Gender and age did not discriminate the mobile phone calling behavior of students. In other words, whether being male or female, young or old the therapies were not effective in dealing with students' mobile phone calling addiction.

### Recommendations

Counsellors should consider the use of CBT to reduce mobile phone calling addiction since the therapy can complement each other to make it more effective in dealing with the addiction. The Counselling Center of the University of Cape Coast should educate students on how they can become vulnerable to mobile phone calling addiction. The Center should take advantage of the orientation programmes being organized by the Office of the Dean of Students at the beginning of every academic year to educate and support students who volunteer for

support. Counsellors in the university are encouraged to publicize at organized workshops that mobile phone calling addiction is critical for people of all ages irrespective of gender and encourage victims to come for treatment.

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# Disgusting for being HIV infected: Case study on HIV knowledge, sexual risk behaviors, and attitudes among MSM overseas Filipino workers in UAE

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## ABSTRACT

HIV has been prevailing in many societies as a health threat and numerous men are affected of this global health crisis. This study aimed to explore the knowledge, attitude, and sexual risk behaviors of overseas Filipino workers (OFW) men having sex with men (MSM) about HIV. Through a qualitative using case study research design, in-depth key informant interviews (KIIs) were done to secure primary data collection and better understand the informants' experiences and perceptions about HIV. The informants of the study involved 10 OFWs who worked in Dubai, UAE. Based on thematic data analysis, findings highlighted that the informants were knowledgeable of HIV transmission, symptoms, and prevention and treatment. They avoid drug use and practice safe sex especially through condom use to avoid HIV infection. However, they admitted to sexual risk behaviors. Consequently, the MSM pointed out the stigma, insecurity, and hopelessness of people dealing and living with HIV disease and enjoin people to give them fair treatment and acceptance in society. This study recommends expanding HIV awareness campaign programs to lessen the HIV disease and discrimination against people with HIV through promoting in social media and other relevant platforms and health support services.

**Keywords:** HIV knowledge, HIV attitudes, HIV behaviors, sexual risk behaviors, MSM, OFW

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## INTRODUCTION

According to the WHO (2017), HIV continues to be a major global public health issue, having claimed more than 34 million lives so far. In Middle East and North Africa (MENA) context, risks and vulnerability are high as the epidemic is on the rise with evidence indicating significantly increasing HIV prevalence, new HIV infections and AIDS-related deaths (Haroun et al., 2016; Shakiba et al., 2017). The United Nations AIDS Program (UNAIDS) reported in 2018 around 220,000 people in MENA infected with HIV and living with AIDS.

HIV outbreaks have had a significant impact on men who have sex with men (MSM) across the world. MSM epidemics are resurfacing in many high-income nations and gaining traction in numerous low and middle-income ones. Improved HIV preventive measures are desperately required. However, due to homophobia and prejudice (Chemaitelly et al., 2019; Hamarsheh, 2020; Mumtaz et al., 2018), limited access to HIV testing and care, and budgetary restrictions, scaling up HIV prevention initiatives for MSM poses great difficulty (Sullivan et al., 2012). Moreover, numerous years of labor migration of Filipinos specifically in Dubai have created employment opportunities

but have also exposed the Filipino workers to health risks such as unsafety sex. Some factors that contributed to risky sex were drug abuse, loneliness, distance from families, peer influence, excessive working hours, and poor housing circumstances (Awasthi et al., 2015; Chowdhury et al., 2018). The workers' low-income increased HIV risks since they tend to switch jobs, pay for labor with sex, and relocate to different places with strangers (Chowdhury et al., 2018; Hirsch, 2014). Migrants have long been regarded as one of the populations most vulnerable to HIV infection and its repercussions. The contribution of migrants to national epidemics varies throughout the world, with Europe and Asia having the greatest rates (Amo, 2016).

In relation to the situation of the Filipinos in the Philippines, a systematic review (Restar et al., 2018) revealed overall results of previous studies show that the majority of the HIV studies done in the Philippines were cross-sectional studies that described HIV and STI prevalence and risk variables in Filipino populations. Likewise, female sex workers were the predominant research group, with just a few studies reporting data from MSM, persons who inject drugs (PWIDs), and youth. Moreover, MSM and overseas workers are some of the known critical demographics for HIV risk in the Philippines (Restar et al., 2018; Ross et al., 2013; WHO, 2015).

Likewise, there is a scarcity of research that analyzes HIV experiences and risk behaviors among overseas Filipino workers (Ofreneo & Canoy, 2017.) who came from a developing nation environment. Considering the scientific gaps, this is a qualitative case study that desires to shed light on the experiences and perceptions about HIV of MSM Filipinos who are working abroad. To further quantify and alleviate this population's HIV load, data collecting, research, and HIV prevention and care especially geared to males who have sex with men and women are required (Friedman et al., 2014).

The present HIV crisis requires immediate attention. Controlling an HIV pandemic requires the integration of services for critical groups and sexual health education. There is a need to address misinformation regarding HIV, how it spreads, and who is at risk. HIV awareness includes understanding its cause, mode of transmission, preventative methods, and outcomes.

As such, an investigation of the HIV awareness and perception among overseas Filipino workers (OFW) in Dubai, United Arab Emirates, is essential. This is an attempt to determine whether increased awareness may aid in HIV/AIDS prevention and eventual eradication. Hence, the goal of this study was to examine men's HIV knowledge, risk behaviors, and attitudes of men having sex with men OFW.

## METHODOLOGY

The information in this research was gathered through personal interviews among OFW MSM particularly in Dubai, UAE. Prior to the interview, the researchers formulated a standard interview questionnaire regarding HIV risks behavior and awareness.

### Research Design

This study applied a qualitative approach using case study research design. Case study is a research approach that generates data through an in-depth and multi-faceted understanding of a complicated issue in real-life context (Crowe et al., 2011). In-depth interviews were done to secure in primary data gathering to understand the informants' experiences and perceptions.

### Case of the Informants

MSM is a category of men at increased risk of HIV, which allows sexual health workers and epidemiologists to address the high-risk activity itself, in particular, peno-anal intercourse, without qualifying the man's sexual orientation (e.g., homosexual or bisexual) or reasons for engaging in same-sex activity (Segen's Medical Dictionary, 2011).

The informants of the study were composed of 10 OFW MSM who are working in Dubai, UAE. They were chosen through snowball sampling. The criteria to be an informant in the in-depth interviews included self-identification as a member of the MSM population, the age of at least 21 years old and above. All of them met the participation criteria and were handed with informed consent prior to the interview.

The MSM informants are between 25 to 35 years old who are all affiliated as Christians. There are high school graduates, college level, college degree holders and a master's degree holder. They are employed in Dubai for a contractual basis. They work fulltime in a white-collar or blue-collar nature of employment. They live with their partner, family, friends, and workmates. Two MSM are homosexuals and eight MSM have a bisexual gender orientation.

A greater number of the MSM interviewees articulated that they have positive and fruitful working environments because they have no challenges encountered with their employers. They do not have problems in dealing with their workmates because they deal with them professionally. Some MSM deal with financial problems because they send majority of their hard-earned incomes in the Philippines. Three were forced to have sex with the same gender orientation.

### Research Instruments

Socio-demographic and behavioral data were collected using a questionnaire. Audio-recording, transcribing, and analyzing qualitative and questionnaire data was encoded in the computer but had been analyzed by the researcher without the use of a computer software.

The categories relating to risk behavior were, as follows:

1. the use of social network for seeking sexual partners and the marketing promotions of MSM entertainment venues,
2. social influence by peer and older MSM,
3. easy access to high parties and group sex,
4. easy access to club,
5. conceptions related to HIV risk, and
6. sexual preferences of MSM.

Significant sociodemographic information such as age, religious background, level of education and employment were gathered about these informants to gain an understanding of their background and provide a descriptive context for their experiences.

The questionnaire labeled with general, specific, and probing questions served as a guide instrument which was used for data gathering during the in-depth interviews. This was presented to the adviser for thorough validations, corrections, and further suggestions. After the aforementioned processes, the researcher made revisions until the questionnaire was valid and reliable enough for assessment.

### Ethics and Data Collection

Some of the contacted persons did not participate in the study due to privacy and confidentiality concerns since the nature of the study was sensitive, so they declined to participate. The researchers understood their concerns and respected their decision. Hence, only 10 snowball sampled informants consented to participate in the study. The informants voluntarily participated in the interview process so long as their identity is not revealed to which the researcher assured them of the highest ethical standard of confidentiality. Interviews were held to place wherein it is convenient and conducive to the informants. A consent form was handed to each informant prior to the conduct of the study. One of the researcher who is based in Dubai at the time of writing conducted the interviews face-to-face and met the informants in places convenient to them.

The researcher gave assurance to them during the interviews that all the data collected would be treated confidential and assured them to protect their identity. The researcher requested for a video recording to which the informants gave consent, but the researcher asked them to cover their faces with towels or shawls during the interview proper. Each interview lasted for approximately 45 minutes to an hour and half. The interview was done in mixed languages such as English, Filipino, and native language to allow the informants to feel at ease in answering the questions according to the language of their hearts. During the



interview, the researcher established rapport to them to make them feel comfortable all throughout the interview protocol.

The approved questionnaire was used as a tool during interviews to generate the needed data in the study. The second researcher who is based in the Philippines has no access to the personal identity of the informants and no communication exists in whatsoever form that would link the second researcher to the informants. The second researcher only had access to the transcripts and processed video which were already in code names.

### Data Analysis

The results were collected and kept for the data analysis using document analysis and thematic analysis. Audio and video recorded interviews were used in Filipino dialect. All the video and audio recorded files were transcribed to documents for the qualitative analysis. All the transcripts were processed thoroughly to develop a reliable written output to relevant detailed issues.

Thematic analysis was utilized for the analysis and interpretation of the qualitative data. The analysis was anchored in the work of Braun and Clarke (2006). The researchers read many times the transcripts, encoded, and jotted initial notes to determine the meanings of transcripts from the answers of the informants. The researchers translated the transcripts to the English language and then generated the initial codes in an organized way and collated the pertinent data to each code.

Afterwards, the researchers created codes while reviewing the transcripts and the instrument simultaneously. Then, the researchers reviewed the categories to create initial themes in relation to the whole data to find out for additional categories, identify sub-themes and create a map from the analysis. The last phase involves refining the categories to be included in evident labels under the themes and sub-themes. Finally, the researchers had a final analysis of the excerpts to align to the objectives of the study and the literature that had been reviewed.

## CASE RESULTS

The purpose of this study was to investigate the perception, knowledge, and risk behaviors about HIV of MSM OFW. Prior to the core interview questions, the first researcher gathered significant demographic information such as age, religious background, level of education and employment about the informants to gain an understanding of their background and provide a descriptive context for their experiences. Thereafter, the results shown below focused on the purpose of the study.

### HIV Knowledge of the Informants

HIV knowledge is a major strategy used in the prevention and control of HIV/AIDS around the world (Alhasawi et al., 2019). Inadequate understanding and risky health behaviors are key roadblocks to HIV prevention. This knowledge is vital to MSM informants when dealing with health issues.

**Table 1** presents the HIV knowledge in terms of mode of transmission with identified categories: HIV transmission and HIV symptoms. Nine MSM stated that HIV can be transmitted through unprotected sexual intercourse. They also confirmed that pregnant women infected with HIV can have babies born with HIV. Likewise,

**Table 1.** HIV knowledge in mode of transmission

Categories	Number of informants	
HIV transmission	Unprotected sex intercourse	9
	Blood contact	4
	Oral sex	2
	Breastfeeding/pregnancy	9
	Syringe	1
	Saliva	1
HIV symptoms	No indications	2
	Weak immune system	7
	Fever, cough, & colds	3
	Weight loss	1
	Skin diseases	5

four MSM remarked that HIV can also be transmitted through the bloodstream or blood transfusion.

*Archer:* They said if you have sex with a person with HIV. You will be infected ... contact. Example if you are not using anything in safe sex, such. Condoms, like that ... They said because it is within the genes so therefore infection can be transmitted to the child.

*Jun-Jun:* Because you have gotten him into the womb. So, it is possible that the child will be HIV-infected.

*Harry:* Yes. because of bloodstream, through bloodstream ... especially in the mother's womb. So, the bigger the chances to transfer.

*Jay:* As per my understanding, HIV can be transmitted through body liquids ... like blood, semen.

Two MSM Harry and Jun-Jun mentioned that HIV can be transmitted through oral sex when there are open wounds in the mouth. Harry also confirmed that the use of syringe can also transmit HIV however Zed stated that HIV can be transmitted through saliva. He mentioned that

"I think according to the study, it can be transmitted through saliva but there is like a specific amount before you can get the virus or maybe blood and what else any fluids which is infected with the virus, it can be transmitted as it is."

The MSM informants also attested to the signs and symptoms of HIV. Seven informants stated that one of the most underlying signs of HIV proliferation in the body is a weak immune system. (James: "maybe your body will become weak or something, fever like that"). Five MSM asserted that skin diseases are the other signs of an HIV attack which can be in a form of rashes. (Derio: "Maybe you will become weak or lethargic and there will be something in the body, what's it? rashes like that").

Three informants, Zed, Jay, and Jun-Jun also mentioned that a person with HIV can experience symptoms of fever, coughs, and colds. However, Arthur and Archer said that there are no indications whether a person already has the HIV or not.

(Arthur: The thing is, as far as I know, you cannot detect. There is no signs and symptoms when you have HIV because it slowly eating and killing your immune system ... you can not see any,



**Table 2.** HIV knowledge in prevention and treatment

Categories	Number of informants	
Stay HIV negative	Loyalty to partner	2
	Withdrawal	1
	Safety sex using condom	10
	Abstinence	3
	Supplements	2
	Celibacy	1
	Checkup	1
	Healthy living	1
	Buy anywhere	1
	Schools	1
Condom availability	Government agencies	1
	Drug stores	4
	Market/stores	3
	Health center	2
Drug avoidance	Avoid drugs	10
	Finding right people	3
	No idea	2
	Change lifestyle	1
HIV testing	Self-assurance	5
	HIV awareness	7
HIV treatment	No treatment	7
	No idea	2
	There is treatment	1
HIV vaccine	No vaccine	4
	No idea	6

like signs and symptoms unless you come to the point that you already have AIDS.)

**Table 2** presents the knowledge of the informants in terms of the prevention and treatment of HIV. All informants explicated that to maintain an HIV negative result, one should use condoms for safety sexual intercourse.

**Harry:** Always be protected like using condoms and as much as possible that it does not release inside because even with condom it still released.

**Jun-Jun:** We should always use protection ... like condom.

Three informants Zed, James, and Orlando strongly asserted that there is a need for abstinence on having sexual relations to avoid HIV infection. Arthur and Jun-Jun both stressed that loyalty to one's partner is essential for preventing HIV. There are also two informants who mentioned to take supplements in order to have a strong immune system. The rest of the informants mentioned celibacy, healthy living, withdrawal during sex, and check-up can help persons to fight against the HIV disease.

**Harry:** Protected sex. Like use of condoms, you have to take your immune boost to kill the virus immediately. Like in Australia, they have been injecting like amm supplements or vaccines then boosting your immune level like 99%, 98 to 99% amm even if you are still having sex, you're protected. Just keep that medicine.

All the interviewees strongly advised to avoid using drugs to refrain from being infected of HIV. To avoid being influence in using drugs,

three MSM mentioned to find the right people who are of good influence.

**Harry:** Do not take drugs. If you used drugs, You will be unaware of what are being injected to you. It might be, one of the reasons, like in the bar, when you are already high, you do not know what has been injected to you. If the syringe used to you was also used by infected person or have infections.

**Zed:** To avoid—then do not use drugs. To avoid then do not use it. Why are you going to use these drugs.

**Arthur:** It is all about finding the right people. With whom you make friends, right? Perhaps... you have to know also if who are deserving because if your circle of friends is addict, most probably the pressure is there so you cannot avoid. Finding the right people or group of people that will help you also or will not put you in that position.

However, two MSM have no idea of how drugs can be a source of an HIV infection. But Jun-Jun advised to have a change lifestyle through a healthy living such as exercising to avoid drugs as he mentioned that: "Should ... change the lifestyle like exercising, as in everything in the lifestyle in order to avoid drugs."

When asked on the importance of HIV testing, seven informants stated that HIV testing is necessary to be aware if whether one has an HIV infection or not. Five MSM claimed that the purpose of HIV testing is for self-assurance that one can have peace of mind of being free from HIV disease.

**Orlando:** So that you will be able to prevent—so that you will be able to know the result if you are sick or if you are infected, if you are infected you will be able to avoid infecting someone else.

**Archer:** First of all, you need to know for yourself whether you are sick or not, if you have HIV or not, then, the confusion that has been kept by yourself will be answered.

**Harry:** So that you will know if you are safe, and others will also be safe with you.

Six informants confirmed that there is no treatment for HIV. Zed explicated that "Well, as far as I know, there is no cure yet, but I think they are trying to discover something which is working for those and I'm not sure if it's working for the general." and Jay also stressed that "... as far as I know there is no medicine. But there are medicines that will prevent to worsen the sickness." One informant said that there is no treatment for HIV, but it can be prevented.

**Derio:** As far as I know, there is. There is treatment for HIV. They are still discovering cures. There is no treatment but there is prevention like that medicine.

Meanwhile, one informant said that there is a treatment for HIV disease. Another two MSM, Archer and James have no knowledge whether there is a treatment or not. When asked whether there is a vaccine shot to cure HIV, four informants confirmed that there is no vaccine while the remaining six have no knowledge whether an HIV

**Table 3.** HIV knowledge in health services

Categories	Number of informants	
Health facilities	City Health Center/Hospital	5
	No idea	5
HIV awareness program	Free HIV testing	1
	HIV awareness campaign	3
	Free vaccines	4
	Free condom	2
	No idea	3
Support services	Government	8
	Private agency	1
	No idea	1

vaccine exists. Zed stressed that “I do not think so that there’s a vaccine.” and Jay supported that “As far as I know there is no vaccine for HIV.”

**Table 3** presents the HIV knowledge of the informants in health services. Five informants pointed that testing of HIV can be conducted in different city health centers or medical clinics. On the other hand, there are five informants who honestly said that they have no knowledge on the health services in terms of the facilities.

*Jay:* In medical clinics. I forgot the establishment, but I just had test recently.)

*Jun-Jun:* Here. There are so many medical centers in the country that are free and there are also private medical centers that are not for free... In the Philippines... there might have so many health centers also. However, I am not 100% sure if they will immediately identify you are HIV-positive.

*Derio:* to ask if where it is currently existing - you must research on it. I have no idea.

Arthur, Tonyo, Orlando, and Derio mentioned that the government agencies provide free medicines for those who have been tested positive with HIV as part of the HIV health support services. Three informants, Arthur, Harry, and Zed remarked that there are HIV awareness campaigns with the ultimate goal of giving free orientation to people in the surrounding areas. Harry explained “I think they are groups of individuals who are raising awareness and then they are asking for small donations like five hundred. That’s all—then you can have your test summary.” Also, free condoms are given as part of the HIV awareness program as Zed and Derio attested. (Derio: “Maybe vitamins. It is just that and a condom. That is probably what they are giving.”)

*Arthur:* As for my partner, the moment you step in, you get tested, and either you’re positive or negative, there are trainings and seminars, so if you are negative, you’re lucky because seminars are just what you need to get but then for those people who are positive, they will immediately provide immediate assistance like I think ... like free amm vitamins.

Zed also mentioned that there is a free HIV testing for people to fight the disease as he remarked that “Free HIV testing, they’re giving away condoms, and they are orienting people to be fully aware about the disease.” However, three informants, Jay, Archer, and Jun-Jun have no knowledge of the HIV awareness program for people.

**Table 4.** Sexual risk behaviors of MSM informants

Categories	Number of informants	
STD diagnosis	Yes	3
	No	7
Sexual acts with HIV negative	Yes	5
	Not sure	5
Specific sexual behaviors	Oral	1
	Anal	1
	Oral-anal	4
Protection/condom use	Did not disclose	3
	Vaginal	3
	Yes	7
Preferred gender	No	1
	Do not want to disclose	2
Multiple partners (past five years)	Bisexual	4
	Homosexual (straight)	3
	Heterosexual	3
	0	1
	1 to 5	2
Commercial sex	6 to 10	2
	11 to 15	1
	16 to 20	2
	21+	2
Sex toys	Yes	6
	No	4
	Yes	2
	No	8

*Jay:* I do not know anymore in the Philippines because I have not been tested there yet. But I have to say something about what do we call that, what the government is—what it is, at the mall is what it takes to call it.

In terms of support services, eight informants are aware that the government agencies such as the DOH provides health support services for the Filipinos. Arthur explicated that “there are some government agencies that helps—I mean I’m only speaking sa Philippines; we have government agencies that supports those people or victims.” However, Jay frankly said that he has no knowledge of the agencies who provide for the health support services. Harry answered that the private entities are the ones who give health support services for those persons who are dealing with HIV.

### Sexual Risk Behaviors of MSM

**Table 4** shows the sexual risk behaviors of MSM. The categories that resulted from the responses of the interviewees includes STD diagnoses, sexual acts with partners whom they guess are HIV negative, specific sexual behaviors, use of condoms and protection, gender orientation that they prefer having relationships with, number of partners that they had have in the past five years, commercial sex, and whether they use toys during sexual relations. Three of the interviewees confided that they experienced the symptoms and diagnosed with sexually transmitted diseases such as gonorrhoea, HIV, and the like.

*Harry:* I just do not know what really it was, way back college. One time, it is called—at the bar, drunk, there is a young man in Malate and then arrives like 2 am, switching all the people there, and then, you know, sex all the way. to random people. There I got it.

Jun-Jun admitted that he was diagnosed with gonorrhea:

"I have undergone checkup to my doctor because there are changes in my discharge. I'm so surprised it stinks. So, I also knew who infected me."

The other one was informant 8, James who had gonorrhea. On the other hand, seven informants did not experience having officially diagnosed with sexually transmitted diseases. (Jay: "Not officially diagnosed but I had STD's symptoms... I bought antibiotics drug. For one-week symptoms has been gone.")

On performing sexual acts with HIV-negative, five MSM have been positive on saying that their partners do not have sexually transmitted diseases. (Arthur: "for me if someone is suspicious, especially if the person is really active ... I do not go with them." However, the other informants are not sure if their partners have HIV since they are not aware of their partners' health. Derio said that he was not aware whether his partner has a sexually transmitted disease but admitted of HIV symptoms observed in his partner. (Derio: "I am not sure if it is HIV, but I feel that it is still related to HIV, symptoms of gonorrhea, that's it." Jun-Jun also recalled that he once had an Egyptian partner whom he was unsure of with the disease. He said that

"It happens in Dubai, he is also my chatmate, when I saw it has so many warts, wounds, and rashes. So, I want to confirm, but he refused, so I forced him. Until I reached the point that I would summon to police, so he was threatened to me then he back off."

The informants shared the specific sexual behaviors that they practice such as performing or receiving oral-anal sex and anal penetrative sex and the like. Four MSM engaged in oral and anal penetrative or receptive sex. While others prefer both oral and anal sexual behavior. A few did not disclose their sexual acts behavior because they were either not comfortable or shy to share their experience. Among those who admitted as bisexuals, James, Orlando, and Derio engaged in vaginal intercourse as one of their sexual behaviors.

The MSM also do specific sexual practices using condoms. Seven informants admitted that they use condoms. They use condoms for anal sex and some of the bisexuals also use condoms for sexual acts with women. Archer though did not use condoms since he only had sexual intercourse when he was a youth:

"No no. It's been a while condom is not widely used at that moment and had not been engaged in sexual relations with other people then I tried it once however it's been a while. I'm still young. Maybe confusion, there it happened but now it's gone."

Zed and Derio did not disclose that they use condoms during sexual intercourse.

The MSM frankly shared the gender orientations of those they prefer to have relations with. Four of the interviewees, Jay, Archer, Orlando and Derio prefer having relations with bisexuals. Derio has sexual relations with both men and women, but he prefers women: "(Maybe, woman. I have experience but I prefer the woman ...)."

However, due to financial burdens he encounters in Dubai, he also engaged having sexual relations with men but with payments, he added:

**Table 5.** Attitudes towards practicing safe sex

Category	Number of informants	
Highly favorable attitude	Sense of responsibility	2
	Discipline	1
	Health conscious	2
	Safety precautions	5
	Condom use	10

("Of course because of having not enough money, financial, even if you do not like, just go.")

Three informants, Zed, Tonyo, and Jun-Jun, said they prefer a "straight guy". While three informants, Arthur, Harry, and James are into heterosexuals as partners. (Arthur: "Bisexual, gay or whatever they define themselves as long as they love men too."); (Harry: "any type of guy as long as he is a guy. Except for what, those are cross dresser."); (James: "Boys, girls, no problems.")

For the past five years, the informants have engaged in a couple of sexual relationships. Archer honestly said that he never had sexual partners since he does "self sex" for the past five years but had sexual relations when he was in his teens. Harry confirmed that he had "many to mention...more than 20. I think more than 20, 30."

Due to dire sexual or financial needs, more than half of the numbers of the MSM informants are engaged in commercial sex either to be paid or to give payment for the sexual acts to satisfy them and provide for their needs.

*Arthur:* Yes. I cannot deny the fact ... I am being paid.

*Harry:* Yes. I paid for or being paid to me? The maximum payment I paid was maybe a thousand, one thousand pesos ... Being paid to me—five hundred. No, seven hundred pesos.

*Jun-Jun:* I tried to pay, I also tried being paid. Approximately 200 dirhams.

James, Orlando, and Derio also confirmed that they had been paid for sexual service since they do not earn a lot, but they have to send money to provide for the needs of their families in the Philippines. On the contrary, four MSM did not engage in commercial sex such as Zed, Tonyo, Jay and Archer. Arthur and Harry used sex toys in sexual acts with partners either with a condom or without a condom. The rest of the MSM informants do not use sex toys, as Zed explained, he finds using sex toys as "weird."

#### Attitude of Informants: Practice Safe Sex

**Table 5** presents the attitudes of the MSM towards practicing safe sex. All informants are favorable on practicing safe sex for safety precautions against HIV. They stressed on being health conscious. They are favorable in safe sex because they said that the person should be responsible and disciplined.

Arthur stated, "If they practice safe sex, then they are responsible, they're disciplined." Arthur said that condom use is "mandatory", and Jay and all the informants reasoned positively to keep protected and stay healthy and HIV-free. However, Arthur also explained that using condoms could not fully protect. Zed and all remaining MSM also have the same attitude towards the use of condom that it does not guarantee a 100% protection. There is also a tendency for the condom to break during sexual acts as others added.

**Table 6.** Dealing with people living with HIV

Categories	Number of informants	
Dealing fairly with HIV persons	Acceptance	1
	Fair treatment	5
	Encouragement for treatment	3
	No comment	1
Difficulty of living with HIV	Regrets	1
	Feeling weak	1
	Losing hope	3
	Insecurity	3
	Stigma	2

**Arthur:** 95 to 99% because there are different types of viruses like for example, you'll meet a guy who is using condom however having warts around his pubic area. Yes. I'm serious. There are warts you've seen somewhere. It is something contagious. So, it is not—I mean if HIV, I do not know but I mean many sexual transmitted diseases you can acquire.)

**Zed:** Because well the condom fabrication I think they—the condom itself, they do have something like small dots there so that your penis can breathe. So, there are still small dots that could be the pathway of any fluid and then if the person is infected, I think it's still possible. So, I do not think it's 100% sure.

**Jun-Jun:** Actually, I really do not like it, but it's needed to avoid diseases. So, condom is a must.

#### Attitude of Informants: Deal Fairly with People Living with HIV

**Table 6** shows the attitude of the MSM informants in dealing with people living with HIV. Two categories came out of the analysis, which include dealing fairly with those people who have HIV and difficulty of persons living with HIV.

The informants emphasized that those persons with HIV should be dealt fairly and not shunned or judged by society for having the disease. Likewise, everyone should be treated humanely.

**Harry:** Like normal. Cause basically, it's just normal if we have the HIV. Maybe it's just normal, all you just have to do is to take care of yourself because you have to maintain your immune system, you must always boost it because the moment it will become wick, there are tendency you will get sick faster. and then sometimes it will lead to complication so the ammm when you are diagnosed with HIV, you must have a normal sleep habit, you are no longer in the populated area, then you have to set up—just healthy living really. As in complete healthy living.

**Jay:** We should treat them right. Because the disease is not that contagious except if something really happened with them. They should not be threat.

**Archer:** You treat them well as a human being because they really do not want to have HIV. Even if they have HIV, they are still human being, so they need more care, support.

Three of the MSM gave some advice to encourage those with HIV to undergo treatment. James, Orlando and Derio said positively on the

treatment of those persons with HIV. Jun-Jun remained silent when asked on his perspective. But acceptance of the person in dealing with persons who have HIV is valuable for him.

**Arthur:** Acceptance is much more important I think, showing that you care for that person is really important. I mean, they came to the point that they were infected, and they still need to see or receive love. Cause if no one loves them, then they're wretched, right?

Living with an HIV disease is a major challenge to the lives of those persons and of their family when they have to deal with such dire health circumstances. Harry mentioned how HIV-infected persons felt so he believes that one should love himself even more:

“Regrets that I should have done to, I did not, I would have protected myself, and I used protection, I would not have done it. Well, then if you do not have the right people that will guide you, like those groups of individuals who help for tests, to people that are being diagnosed, if you do not have that partner's, or your family's support, it's hard. You feel like it's over, but it's not really over. They'll love themselves more ... and then their life and then your family will be closer. I believe.”

Stigma is also one that two MSM informants believe can give the persons with HIV more difficulty in their lives. Tonyo, Jay, and James also felt and said that those with HIV felt hopeless and have a minimal chance of living. Likewise, some mentioned that insecurity creep an HIV persons' feelings.

**Orlando:** Of course, because it seems like you are losing your—maybe you do not have thrust to yourself, maybe you will be intimidated. Of course, you have sickness.

**Derio:** Of course, insecured, hiding, and so on. And their life is no longer enjoyable about sex life, of course they are sick.

**Tonyo:** Because you think that things can happen to you, of course, there are possibilities that you will die. So, every day you feel ashamed.

**Jay:** Just having HIV. It's very hard if someone has HIV, because it seems that you just have a little bit of hope.

**Zed:** difficult thing about living with the disease is like the stereotype that people used to think about you that you got the disease because of you just being flirt to anyone. That is just a challenge there. The acceptance of community and acceptance on yourself that it did happen to you.

**Archer:** That's what, most of the people will treat you, like you are so disgusting for being HIV infected, just like this. they will avoid you because you might infect them. That will be the treatment of the people to you.

James articulated that most of those with HIV have no more chances of curing the sickness (“treat that anytime your life will be ended because you are HIV positive”). However, Archer feels optimistic for those people with HIV since it depends on the support system of the person.



**Archer:** Depending on the person's support. There are HIV positive that really do not have anything to do with themselves, there are also do not. So, it depends on their family's treatment as well as of the people.

The informants emphasized that life is so short, that there are so many things to do, that they still have a future and a chance to be treated, and that they still wish to live longer.

## DISCUSSION

This study examined the HIV knowledge, risk behaviour, and attitudes of men having sex with men OFW. When asked about their HIV knowledge, the informants explicated that HIV transmission happens when an infected person transmits it to an uninfected person through sexual contact, blood transfusion, sharing intravenous needles, and pregnancy. They are knowledgeable since they are aware that HIV can be transmitted through unprotected sexual intercourse, through the bloodstream or blood transfusion, oral sex and syringe and symptoms include weak immune system, skin diseases, fever, cough, and colds; In terms of the prevention and treatment of HIV, all informants explicated to use condoms for safety sexual intercourse.

Likewise, six informants asserted that there is no treatment for HIV. On prevention and treatment of HIV, all informants explicated to stay HIV negative through condom use, which is accessible in drugstores and anywhere, to avoid drugs, to find the right people to trust, and to have HIV testing for awareness of health conditions. MSM informants said there is no treatment, but more than half stated that no vaccine shots are available for HIV infection. On knowledge of the health services, the informants are knowledgeable since they pointed that testing of HIV can be conducted in different city health centers or medical clinics.

Parallel to the results, a study by Arellano et al. (2019) reported that the majority of MSM respondents in Manila, Philippines had a high level of understanding regarding HIV transmission, with at least 70% of respondents answering yes to the questions. At least 78% of responders also correctly answered the questions about HIV prevention, diagnosis, and treatment. CDC (2015) also confirmed that there is presently no viable HIV cure but may be managed with good medical treatment. Antiretroviral therapy, or ART, is a type of HIV treatment. If correctly taken every day, ART can significantly extend the lives of many HIV-positive people and reduce their risk of infecting others. Increasing HIV treatment will function as a preventive strategy (Fettig et al., 2014). The awareness of available treatment was a positive determinant of HIV testing (Alkaiyat et al., 2014).

Another study by Vu et al. (2012) stated that drug users asserted that men selling sex were particularly at danger because of using drugs as a tool for sex work and trading sex for drugs. Majority of the informants are aware that the government agencies such as the Department of Health provides health support services for the Filipinos. Interventions are needed to assist males limit the number of sexual partners they have, the frequency of unprotected anal intercourse, the use of alcohol or drugs before to sex, and other mental health difficulties (Koblin et al., 2006). HIV program designers should ensure that PLHIV have simple access to HIV testing and treatment. To meet the UNAIDS 90-90-90 objective in the Asia-Pacific region, many

socio-economic and health-system hurdles must be addressed along the HIV care continuum (Koirala et al., 2017).

The sexual risk behaviors of MSM OFW include being diagnosed with sexually transmitted diseases; do sexual acts with partners whom they guess are HIV negative; engage in specific sexual behaviors such as oral and anal sex; use condoms for anal sex; prefer relationships with bisexual, homosexual and heterosexual gender orientations; have multiple number of partners in the past five years; engage in commercial sex; and some MSM use sex toys during sexual relations. A study (Inungu et al., 2019) confirmed in a cohort that HIV risk behaviors were common. 83.3 percent of MSM reported receptive anal sex (RAS) in the six months before the study, with an average of seven sexual partners. During the past RAS, as many as 37.7% of MSM did not use condoms. About 65.9% (n=249) of respondents admitted to drinking alcohol before intercourse.

Few of the informants of this study reported not using condoms for safe sex. Similarly, despite having high knowledge on the transmission and prevention of HIV, only 45% of the respondents had regularly used condoms and among those who did not use condoms regularly, 15.4% did not think it was necessary (Arellano et al., 2019). Nevertheless, the informants have favorable attitude towards practicing safe sex for safety precautions, health reasons, sense of responsibility and discipline. MSM are highly favorable on the use of condoms for protection although most of them also agree that there is no full guarantee that condoms can protect against HIV infection.

Moreover, the informants emphasized that those persons with HIV should be treated fairly and offered encouragements to seek for medical treatment and not shunned or discriminated. Acceptance of the person in dealing with persons who have HIV is valuable. HIV prevalence and incidence are projected to be quite low in various MENA nations, and it is thought to be undervalued owing to a heavy social stigma. The HIV risk groups are frequently subjected to homophobia, harassment, discrimination, and criminalization (Beyrer et al., 2012; Chemaitelly et al., 2019; Hamarsheh, 2020; Mumtaz et al., 2018). In parts of Sub-Saharan Africa, same-sex behaviors are scorned. Fay et al. (2011) looked at cross-sectional associations between prejudice, access to and use of health care services, and HIV awareness among MSM. There were strong links found between prejudice and the fear of obtaining health care services.

Improving public awareness of HIV and its transmission and promoting HIV testing as a sensible, responsible, and brave act, might help counterbalance the moral barriers to HIV testing (de Lind van Wijngaarden et al., 2018). While tackling the multiple sources of stigmatizing messages and misinformation will take a large amount of time and effort, it might be a key strategy for expanding HIV testing (de Lind van Wijngaarden et al., 2018).

Finally, MSM also believed that those who have HIV think of losing hope and insecurity so they should have strong support system around them such as their families. Similarly, Africa (2002) noted that Filipino men having HIV provides opportunities for personal and spiritual growth and improve connections with family and friends. Participants utilized their HIV/AIDS diagnosis as a chance to enhance their quality of life. All of the males believed that culture, religion, and family values have a substantial influence on their HIV/AIDS experiences. These individuals' interpretations were influenced by the cultural and family values to which they adhered. Hence, policymakers should consequently be urged to implement harm reduction programs for



persons living with HIV and invest worldwide in lowering HIV prevalence rates in commercial sex workers, people who inject drugs, and men who have sex with men in the region (Shakiba et al., 2017).

## CASE CONCLUSION

Men who have sex with men overseas Filipino workers have reasonable knowledge of HIV transmission, treatment and prevention, and health support services. They are aware of the symptoms of HIV, but more than half believed that no medical treatment exists for HIV. More than half also have no knowledge whether HIV vaccine exists. They explicated to stay HIV negative through condom use, HIV testing, and drug avoidance. The informants are knowledgeable about health services since they pointed out that testing of HIV can be conducted in different city health centers or medical clinics. They informants engage in sexual risk behaviors which suggests that government should expand its HIV awareness campaign program to lessen the HIV disease through promoting in social media. The campaign can reach broader audience especially high-target groups who are more prone to HIV. The informants advocate for a human-based approach in dealing with people who have HIV. Eradicating HIV through HIV education should be a concerted effort or a multi-sectoral approach to alleviate stereotypes and discrimination among HIV victims. The Department of Health should also develop HIV awareness initiatives and campaigns and reduction strategies focused on MSM OFWs. Future studies can be done by using mixed method type of research related to HIV issues to provide rigorous results on effective means of preventing HIV disease. The limitation of this study includes the small sample size MSM OFW that cannot be generalized to other populations. Likewise, the narratives are based on self-reports which can be factual or opinionated as no medical diagnoses or other confidential records were asked for verification purposes. Nonetheless, the results offer scientific implications as this is the first qualitative case study that focused on knowledge, sexual risk behaviors, and attitudes among MSM OFW conducted in Dubai, UAE.

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**Data availability:** Data generated or analysed during this study are available from the authors on request.

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# SentiSfaction: New cultural way to measure tourist COVID-19 mobility in Italy

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## ABSTRACT

From a psycho-linguistic and marketing perspective, the research fits into the evaluation of in the context of tourism and, in particular, tourism mobility, targeting one of the leading Italian rail transport companies, namely Trenitalia. This study, conducted on tweets, aims to examine how talks about the transport service offered by Trenitalia. A total of 674 tweets for the tourist season 2019 and 100 tweets for the tourist season 2020 were collected following the pre-COVID-19 and COVID-19 period. The methodology is the application of sentiment analysis (SA) that produces quantitative and qualitative results. For the quantitative part, the sentiment was calculated first automatically via the Sentistrength software, then an extraction of the frequencies and calculation of the dependence (Chi-square statistic and t-test) between year and polarity was conducted with R, statistical software. The results show that SA is a good methodology of analysis of the online reputation and customer satisfaction of a company that deals with tourism, also in the difference between pre-COVID-19 and COVID-19 period.

**Keywords:** e-tourism mobility, Twitter, sentiment analysis, customer satisfaction, COVID-19 period

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## INTRODUCTION

Customer satisfaction (CS) in the tourism sector, although it is a very studied construction (Sánchez-Rebull et al., 2018), becomes difficult to detect because of its multidimensionality (Rathnayake, 2015). In addition, in tourism, the definition is complex and has a multi-dimensional nature (Smith, 1998) because must consider the feelings of gratification or displeasure, if the tourist is satisfied or dissatisfied (Chen & Chen, 2010). As a result, the CS analysis must return a key to judgment a tourism service (Rathnayake, 2015), playing a critical role in the success of firms and products (Campo & Yagüe, 2009; Campo-Martínez & Garau-Vadell, 2010; Chang, 2008; Lee et al., 2010; Nowak & Sahli, 2007). In this complexity, this research focuses on a dimension of CS in tourist mobility, or the link between experience and emotional involvement mediated by social networks. In addition, according to the literature on CS in tourism, it emerges that CS has been analysed in different subsectors of tourism, for example:

- (1) agro-tourism (Chatzigeorgiou et al., 2009),
- (2) rural tourism (Leingpibul et al., 2009; Loureiro, 2010),
- (3) sport tourism (Martin & O'Neill, 2010),
- (4) alternative tourism (Deaden & Harron, 1994),
- (5) cruise tourism (Hwang & Han, 2014; Zhang et al., 2015),
- (6) air transport (Ginieis et al., 2012), and

- (7) hospitality enterprises (Barsky, 1992; Choi & Chu, 2001; Deng et al., 2013; Fah & Kandasamy, 2011; Motlagh et al., 2013; Zhou et al., 2014).

Zhou et al. (2014) find that 21 of the 24 published studies on CS and 11 of 12 on service quality deal with hotel and restaurant tourist sectors. They, therefore, conclude that more research on CS and service quality is needed in other tourist contexts (Sánchez-Rebull et al., 2018, p. 3). Starting from this research gap, the research aims at showing a methodology that can be applied to measure the emotional dimension of satisfaction in tourist mobility in rail transport. The focus on the emotions of consumers is also linked to the period of pandemic when tourism mobility changes. In particular, COVID-19 outbreaks has also blocked tourism and, as a result, mobility, changing practices and organization. Researchers have started to focus on this area, but the work available so far is limited (Sharma et al., 2021). Starting from this and the previous research gaps, the study aims to answer the following research questions:

1. **RQ1:** How much the review of a tourist mobility service can be affected by the period in which you travel?
2. **RQ2:** Starting from the results of **RQ1**, we wondered if a mixed methodology of analysis of CS, i.e., sentiment analysis (SA), can be an optimal strategy to capture all the multidimensionality of the construct of CS.

On the basis of these research questions, the following consequential hypotheses have been formulated:

1. **H1:** There is a dependence between the calculated sentiment indicating the satisfaction of Trenitalia's customer and the travel period (pre-COVID-19 period vs. COVID-19 period).
2. **H2:** In case of dependence, this is not due to the case.
3. **H3:** In case of non-random dependence, the mixed methodology can be a useful strategy to consider the multidimensionality of CS in tourist mobility.

Indeed, in the field of computational psycho-linguistics, the research proposes the study of an Italian case, namely Trenitalia, a leading company in rail transport. This study, conducted on tweets posted by Twitter users, aims to examine how talks about the transport service offered by Trenitalia. Another objective that the research aims to achieve is to prove that, based on the sentiment obtained (positive, negative, or neutral) companies can collect important information about the points of strength and weakness of service or product. In the study, the tweets of users during the summer holidays of 2019 and 2020 were collected. The total is 674 tweets for the tourist season 2019 and 100 tweets for the tourist season 2020.

In general, the results show that SA is a good methodology of analysis of the online reputation and CS of a company that deals with tourism. One should, however, think of mixed methodologies (quantitative or quali-quantitative) so that the result is understood by the company to identify the strengths and intervene on the weak points of the service.

## TOURIST CUSTOMER SATISFACTION IN ETOURISM MOBILITY: RELATED WORKS

The psychology of tourism is a science that uses theories and knowledge of psychological processes to take care of "man as a tourist" (Mereu, 2004, 2010). With the transition from elitist tourism to etourism, there is an increase in research aimed at verifying the use of social networks to organize travel or research aimed at investigating the CS of companies dealing with tourism. With the spread of new media, which uses digital language (Gui, 2014, p. 25), the experience of travellers is transformed. Of course, also tourism was invested by the "great maelstrom" (De Kerckhove, 2003) of the Internet. Today, in the discursive construction made by social networks, the tourist experience is a "life form" (Manuti et al., 2007, p. 1) linking the use of mobility technologies (aircraft, cars, ships, and trains) to stay in certain places, in a final assessment expressing satisfaction, or dissatisfaction of people. The human experience is largely mediated, that is, characterized by artefacts that manage in an increasingly complex way the practices of attribution of meaning. For this reason, the psychological issues related to the various areas of human-mediated experience can be addressed with greater productivity with qualitative-quantitative approaches. The instrument that is more congenial to the union of the two methodologies is SA, which, starting from textual sources, returns quantitative data. Knowing "what other people think" (Pang & Lee, 2008, p. 1) has always been an important element of information that characterizes the decision-making processes, such as that of organizing a trip, which is the result of a series of decisions that the tourist must make. The decision-making process in tourism is quite complex, as it is necessary first of all that the person is driven and motivated to travel,

then that he can choose a destination based on the motivation and, from these two aspects, the result is others such as the choice of accommodation or the type of transport useful to reach the chosen location. van Raaij and Francken (1984) designed a model consisting of four steps that characterize the moments of decision-making in the organization of a trip:

1. **General decision:** It is the starting point of the decision-making process, and it is at this stage that the traveller decides to leave,
2. **Acquisition of information on possible destinations and itineraries:** It is precisely at this stage that tourism marketing and web marketing strategies have been developed,
3. **Joint decision:** In the case of family or group trips, and
4. **Activities in a specific sense:** This is the last step and concerns the real tourist experience.

The decision-making process and other variables such as motivation, communication levers, self-image are aspects that form the point of contact between tourism and psychology, giving rise to the branch of tourism psychology.

The psychology of tourism is a science that uses theories and knowledge of the psychological and marketing field. With the transition from elitist tourism to etourism, there is an increase in research aimed at verifying the use of social networks to organize travel or research aimed at investigating the CS of companies dealing with tourism. With the spread of new media, which use digital language (Gui, 2014, p. 25), the situations experienced by travellers is transformed: the virtual communities in which it is possible to exchange travel information, feedback systems shall be developed to assess facilities hotels; online tour operators are born and are gradually replacing travel agencies; the development of digital museums guide or technological souvenirs; are growing also systems for evaluating the services offered by companies dealing with mobility (for example Trenitalia for rail transport) or by entities interested in enhancing tourist destinations. Since tourism is a mass phenomenon in our time, it involves the lives of many people and organizes the organization of entire communities. A concise definition but at the same time such as to render it complex describes tourism as:

"the sum of the relationships arising the interaction of tourists, business suppliers, host governments and host communities in the process of attracting tourist and other visitors" (Mcintosh & Goeldner, 1984, p. 3).

Of course, tourism was also invested by the "great maelstrom" of the Internet (De Kerckhove, 2003). Today, in the discursive construction carried out by social networks, the tourist experience is a "life form" (Manuti et al., 2007, p. 1) that connects the use of mobility technologies (aircraft, cars, ships, trains) to stay in certain places, in a final assessment that expresses the satisfaction or dissatisfaction of people.

This research investigates the practices of sense-making that are organized at the interface between two important areas in contemporary human experience: the media and travel, above all in two important historical periods, i.e., the pre-COVID-19 mobility and the COVID-19 mobility. Following the spread of social networks, there is an increasing tendency on the part of companies to want to keep under control, in addition to their online presence, even the management of



their product or service: it is talked about, therefore, of online reputation and CS. In this regard, however, it is necessary to reflect on what is meant by reputation and CS. "Reputation is that set of beliefs, assessments and perceptions that a community formulates about the individual" (Cavazza, 2012, p. 27). The reputation, however, only makes sense when the system of values and perceptions that constitute it is shared by a social group, inserted not necessarily in a physical space, but also symbolic, like the virtual one. In addition to the collective dimension, there is an individual dimension to reputation: every person can act actively on his or her reputation. Companies and organizations also have a reputation. Companies, like Trenitalia, aim to control their reputation, which is the result of the articulation between being known for something in a certain way. The company's reputation is the result of a communicative action arising from the interaction between the organization and its stakeholders. In the tourist industry, many hotels tend to calculate their reputation based on feedback systems left by users. Receiving much positive feedback is a symptom of popularity. The creation of a web reputation monitoring system of a company or brand is based on several concrete applications: an empirical analysis of customer feedbacks and dialogue with customers. In particular, the monitoring informs about problems encountered by the customer concerning the services/products provided by the company and may result in the need to improve some aspects related to its activities, such as the service of front office customers and product/service quality: this is the CS. However, CS in the field of tourist mobility is a multidimensional construct and, for this reason, very difficult to define and detect. Thus, CS in tourist mobility is determined by both subjective (i.e., customer needs and emotions) and objective factors (i.e., product and service features), however, as in the definition of CS, a complete set of attributes that determines CS in tourism does not exist in the literature (Sánchez-Rebull et al., 2018). In this study, the link between consumer experience and emotionality will be considered as a dimension of CS. In this regard, Gountas and Gountas (2007) explain how emotional reactions to service context influences CS. Chatzigeorgiou et al. (2009) conclude that customer emotions are a key determinant to CS and repeated visits. In other words, satisfaction is defined as a tourist's affective state, resulting from an overall appraisal of psychological preference and pleasure towards the tourist destination (Huang et al., 2006). In addition, the analysis of CS becomes even more complex during the period COVID-19 in which the circulation of the new coronavirus has led to the difficulty of mobility (Iaquinto, 2020), especially in the tourism sector. This has had an impact on tourist companies and especially on tourist transport companies, such as those on rails, the subject of research. The current research on the link between tourist companies and COVID-19 focus mainly on the current and perceived socio-economic contributions of tourism to the target communities (Lindberg & Johnson, 1997). In particular, these studies focus on the socio-economic impacts of tourism in times of crisis (Lindberg et al., 2001; Torre & Scarborough, 2017) such as the health crisis from COVID-19.

Moreover, in this delicate historical period, the digitization of tourism also leads to increased control by companies of online presence and its online reputation. The web presence is the space that a company employs on the web, investing in branding, promotion and online marketing. In this landscape, the web reputation, that is the result of communicative action, deriving from the interaction between the organization and its stakeholders (Cavazza, 2012, p. 93). In semiotics, the web reputation and web presence can be understood as an effect of

meaning that emerges from multiple practices of recognition-management-bargaining content through which a subject of the statement marks its presence within a conversation on social media (Peverini, 2014, p. 230). In this way, the object and procedure of investigation are particularly congruent because are framed in the same horizon of meaning: cyberspace. Indeed, cyberspace becomes a place, and at the same time, a means used by customers to express their satisfaction with the service or product. From a business point of view, CS is seen as a key indicator to understand the strengths and weaknesses of the service offered (Dash et al., 2021). Satisfying customers is critical, and more research has been done in this area. This area of investigation, mainly covered by marketing, includes the strategic side of the organization, CS, service quality, company associations, relative costs, increased competition, new product activities, employee capabilities, and efficiency (Hult et al., 2019). These connections have also been recognized in the academic literature (Gummesson, 1998; Hoyer & MacInnis, 2001; Molinari et al., 2008; Ardani et al., 2019). However, the study on CS from the tourist perspective research is sparse; more research is needed on CS from the tourist perspective (Ravishankar & Christopher, 2020). CS can be related to feelings of enjoyment, acceptance, ease, and happiness (Sari et al., 2019). Starting from the feelings of the customers, as a basis of CS in the field of tourism, this work will focus on a methodology useful to detect the emotions of tourists, namely SA.

This important tool for calculating online reputation originates from natural language processing (NLP). Besides, SA is based on computational linguistics techniques and text mining of which it can be said that it is a specialization. As regards the methodological aspect, the software currently on the market is based on techniques such as syntactic and semantic analysis of the text, the interpretation of written language, the identification of idioms, statistical analysis and the repetition of keywords. Most of these software makes use of classification algorithms both to collect and discriminate documents and to detect positive/negative polarities within the text, distinguishing different levels of sentiment intensity. SA is part of the disciplinary field of sentic computing (SC), a transversal field of research.

## INSIDE SENTIC COMPUTING: SENTIMENT ANALYSIS AS A WAY TO MEASURE CUSTOMER SATISFACTION

SC is a disciplinary field introduced by Cambria and Hussain (2012) whose study focuses on how computers can detect human emotionality, starting, for example, from textual data. The term 'sentic' (Cambria & Hussain, 2012, 1) itself describes the approach of this multidisciplinary field. Sentic is the contraction of 'sentiment' in which are enclosed all studies of affective computing and 'common sense', linked to the opinions of human beings that can be investigated.

Because it combines different disciplines, it is not possible to trace a single date of birth of SC. It is a recent discipline, born from the emotional studies in the psychological field of James (1955). James' (1955) theories begin to recognize the centrality of emotions, in different experiences of human life, such as that of travel. Starting from this innovation and following the digital revolution, systematic studies were carried out on computational models that recognized emotions. The innovation of this approach lies precisely in reconsidering the relationship machine-man, able to program, not only artificial



intelligence but especially “artificial emotional intelligence” (Papapicco, 2020). Picard (2000) identifies three types of emotional artificial intelligence with three different functions:

1. systems that detect the emotionality of users,
2. systems that express what human beings perceive as an emotional stimulus, and
3. systems that mimic the perception of emotionality.

This theoretical background will focus on the first type of systems or those that detect the emotionality of users. An example of these systems is the software that falls under the qualitative-quantitative methodology of SA. It is a methodology that is part of the approach of SC, useful to analyze texts to extract a polarity. SA is another multidisciplinary methodology, which will be treated from the field of computational psycho-linguistics.

Specifically, SA (Pang & Lee, 2008) is a methodology of analysis of texts that allows us to extract the subjectivity and the positive, negative or neutral polarity of a linguistic fact, allowing a better understanding of the users' opinion regarding service or product. From the textual data, in particular, it is possible to grasp feelings, emotions, opinions and judgments, or the private states of a person. It is necessary, however, a historical-conceptual distinction between opinion mining (OM) and SA. The expression OM appears for the first time in an article by Dave et al. (2003) published in 2003, according to which OM tools should process a set of information for a given item. The expression SA (Das & Chen, 2001; Tong, 2001), however, was initially used to indicate the evaluation of texts, from where it is possible to extract an emotional polarity (positive, negative, or neutral).

The terms SA and OM are, however, the same field of research and can be interchangeably used. The analysis of sentiment was born with Web 2.0, following the spreading blogs, social networking services (Facebook, Twitter, Youtube, etc.), other user-generated sites content (Amazon, Tripadvisor, Epinions, etc.) in which even non-expert users become content authors. Web 2.0 encloses digital natives (Prensky, 2001) of the years' ninety, who do not passively consume the information made available by the web but transform viewers (Pulcini, 2006) and commenters (Riva et al., 2015). Viewers are the users who modify or create existing content according to their own communicative needs; the commenters are digital natives who are not afraid to expose their opinions on blogs or social networks about specific issues.

These opinions of the digital natives of the generation Web 2.0 are a possible starting point for a SA, a methodology that uses the techniques of NLP, analyzing the textual sources based on semantic classification of words recognized as emotionally charged and the detection of sentiment polarity. Although SA has always aroused interest, it is in 2001 that greater awareness is reached about the issues and benefits of such an analysis methodology. The factors underlying this increased interest in SA are:

1. the increase in machine learning methods in the processing of natural language and information retrieval,
2. the availability of machine learning algorithms following the birth of the world wide web, and
3. the possibility of applying the results in different fields (Pang & Lee, 2008, p. 4-5).

On this basis, recent studies (Amplayo et al., 2018) show that machine learning is one of the most widely used methods in evaluating emotions in texts. On English-language Twitter data, Kaur et al. (2021) use a vector machine (SVM) as a hybrid methodology to detect and evaluate emotions from texts. Other approaches (Taboada et al., 2011), on the other hand, use the detection of emotions in texts through systems based on word dictionaries. The problem posed by scientific literature (Basiri et al., 2021) is that a dictionary-based approach is not enough to extrapolate sentiment from complex texts and, above all, in languages other than English. An example of a Turkish tweets study (Kirelli & Arslankaya, 2020) shows that it is necessary to produce its classification model.

To date, this methodology has many areas of application. SA applied to the tourism sector, for example, allows companies that deal with tourism to verify online presence and reputation, but especially CS, to assess the strengths and weaknesses of the service offered. There are also several tools to SA: the tools are based on algorithms that contain vocabulary of keywords that fall into a positive list, a negative and another neutral. The work of software is to make a match between text sources to be analyzed and inner vocabulary. The program of SA, therefore, facilitates the work of coding texts with sentiment detection. Conversely, making a SA is not always easy, because the authors of the texts in input express their emotions and opinions through a variety of sophisticated rhetorical strategies. A particularly fruitful application of SA concerns the world of social networks, including Twitter, a free social service networking and microblogging, to date one of the most famous and counts millions of users who make it use to inquire, to read opinions, to comment, to have/do followers (especially in political).

As is well known, this social network, which was born in 2006, allows users to post, at most 280 words. Opinions and comments are traceable through hashtags. Tweets help both tourists and tourist companies to gather short and valuable information (Atefeh & Khreich, 2015). Companies are increasingly using Twitter to measure CS (Alkubaisi et al., 2018) as data is always accessible and reachable. A peculiarity of Twitter is the possibility to find both profiles of users and companies and tourist locations: this is the case of Trentitalia, which will be taken into consideration here.

## ITALIAN CASE OF TRENITALIA

In Italy, although lagging behind the rest of Europe, progress is being made towards the digitization of the tourism sector. An analysis of the individual Italian region's online reputation, conducted by researchers of the University of Marche (2015), showed the primacy of Tuscany both among Italian and foreign tourists. While the last places are the Valle d'Aosta and Trentino. Over 16,000 web conversations in Italian and English have been analyzed from which it emerged that Tuscany excels in both rankings and most of the content of the comments refer to the advantages of staying in Tuscany, that is the appreciation of typical food and wine, the charm of the natural beauty of the territory and the cultural heritage, the fundamental reason that drives tourists to visit the region. Calabria is particularly appreciated for the low cost of living, for the hospitality of its inhabitants and the fun, while the lack of information on public transport is a criticism to the region. In the Abruzzo region, however, the most positive comments concern the particularity of the territory and the high level of generosity and hospitality of the natives. Sardinia is mainly named for the beauty

of the beaches, although it is recognized as the main attraction of the territory beauty; some users argue that Sardinia is also appreciable for its history. As far as Puglia is concerned, the main factors of appreciation concern the architectural beauty of the cities, such as squares, castles, churches and sanctuaries and there are numerous positive comments on the spectacular landscapes, the sea and the beaches. You can see, however, the low involvement of users regarding the two last regions in the ranking: the Valle d'Aosta in Italian conversations and Trentino Alto Adige in foreign ones. In particular, the reasons for which the two regions are positioned at the end of the ranking based on the qualitative-quantitative analysis carried out on the online conversations of tourists related to the fact that, for the Valle d'Aosta, A small number of conversations have been noted, and among the few comments analyzed is the evidence of negativity such as poor efficiency of public transport and infrastructure. It is also criticized for the decision to allow hunting on the weekend. For Trentino Alto Adige there are also a small number of conversations, where there are a low emotional impact and user involvement. "Digital tourism" is an increasingly important phenomenon, as can also be seen from data on sources of information for travel planning, according to which 74% of tourists travelling for leisure would use web searches to orient themselves in the choice of destinations. The current change in tourist mobility has not only occurred as a result of digitisation. Another key factor in the current transformation is the COVID-19 pandemic, which has placed restrictions on mobility, particularly tourism. Tourism is one of the most affected economic sectors.

From the point of view of companies, only a few tourism companies are using digital tools to measure their reputation, although some, such as Trenitalia, the transport company is pursuing digitalization as its business challenge. Trenitalia s.p.a. is an Italian rail transport company, born in 1905, under the name of "Ferrovie dello Stato". Addressing, in the labour market, the challenges of ethics, sustainability and technology, Trenitalia is provided with a website and related applications through which customers can buy tickets, receive information and even check train time and status. The mission of the company is precise to satisfy customers, developing for Italy a large mobility project (<http://www.fsitaliane.it/fsi/Chi-Siamo/La-nostra-storia>). Assuming that it is one of the first Italian companies to pursue the challenge of digitalization, what is the online reputation and satisfaction of tourists who use Trenitalia as a rail transport for holidays in pre-COVID-19 and COVID-19 periods?

### Procedures and Hypothesis

This study, conducted on tweets posted by Twitter users, aims to examine how talks about the transport service offered by Trenitalia in two different touristic periods: pre-covid (summer 2019) and during the COVID-19 pandemic (summer 2020) in Italy. Another objective that the research aims to achieve is to prove that, based on the sentiment obtained (positive, negative, or neutral), companies can collect important information about the points of strength and weakness of your service or product and how it is important for the marketing strategies. In the case of Trenitalia, based on the tweets of users can identify, which aspects of the transport service satisfy customers, and which require improvements. To satisfy this objectives, the following research questions and hypothesis were formulated:

1. **RQ1:** How much the review of a tourist mobility service can be affected by the period in which you travel?

2. **RQ2:** Starting from the results of RQ1, we wondered if a mixed methodology of analysis of CS, i.e., SA, can be an optimal strategy to capture all the multidimensionality of the construct of CS.

### Hypothesis

1. **H1:** There is a dependence between the calculated sentiment indicating the satisfaction of Trenitalia's customer and the travel period (pre-COVID-19 period vs. COVID-19 period).
2. **H2:** In case of dependence, this is not due to the case
3. **H3:** In case of non-random dependence, the mixed methodology can be a useful strategy to consider the multidimensionality of CS in tourist mobility.

To check the above assumptions, the tweets of Twitter were collected. The choice fell on this popular social because, in 280 characters maximum, provides the possibility to collect user opinions simply and immediately, thanks to hashtags and the setting of filters that search focused. In the study, were collected the tweets of users during the summer holidays of 2019 and 2020. Summer is one of the high tourist season periods in which travellers tend to organize holidays more frequently. The period taken into consideration goes from:

1. 1 July 2019 to 15 August 2019 for the summer season and
2. 1 July 2020 to 15 August 2020 for the summer season.

As for Trenitalia, were automatically collected tweets incorporating the Trenitalia hashtag. The hashtags chosen were: #Trenitalia; #viaggiacconTrenitalia; #vacanzeconTrenitalia (in the case of 2019: the pre-covid period) and the hashtag #restoinItalia (en translate #stayinItaly) or #vacanzeinItalia (en translate #holidaysinItaly) for the COVID-19 period 2020. The difference in the number of hashtags sought for the two years depends on the fact that, in 2020, for the period COVID-19, the Italian government has encouraged holidays in Italy, launching hashtags such as #stayinitaly or #holidaysinitaly. A first search using hashtags shows the lack of the same hashtags of 2019 in 2020. For this reason, we opted for tweets containing hashtags launched by the government.

The extraction took place through a Google Drive extension tool called "Twitter Archiver" and using the filter extraction system. Searching for tweets via hashtags, combined with content filtering, where the date was set, facilitated the search system. In particular, the filters used concerned the hashtag chosen as the search theme, the period with the dates specified in the dataset. Tweets posted from company pages or tweets containing only data have been excluded from the collection multimedia, such as videos or photos or content linked to other social networks, like Instagram. The extraction has produced, in the summer season, 674 tweets of 2019 and 100 tweets for 2020. It is necessary to specify that Social media users do not pay attention to spelling mistakes when sharing tweets, so the databases have been corrected manually, since the software matches between text and internal vocabulary.

### Methodology

The methodology is the application of SA that produces quantitative and qualitative results. The use of mixed methodology through SA is related to this new focus on feelings of consumers as a new way to calculated CS (Sari et al., 2019). For the quantitative part, the tweets of the two seasons were combined for a comparison of the opinion and satisfaction of the service of Trenitalia between two years.

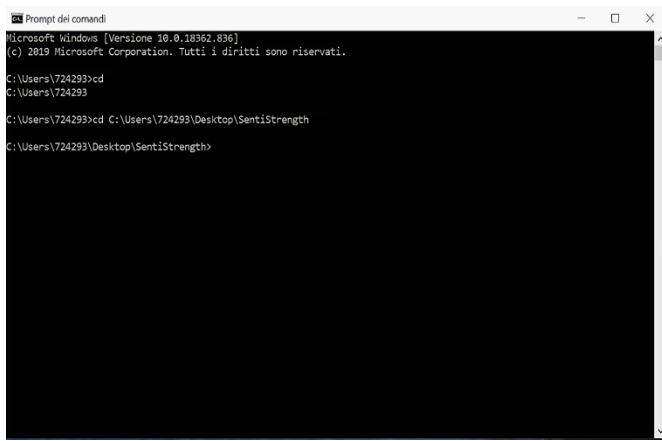


Figure 1. Command prompt, function to launch (Source: Author)



Figure 3. Some examples of booster words and their weight (Source: Author)

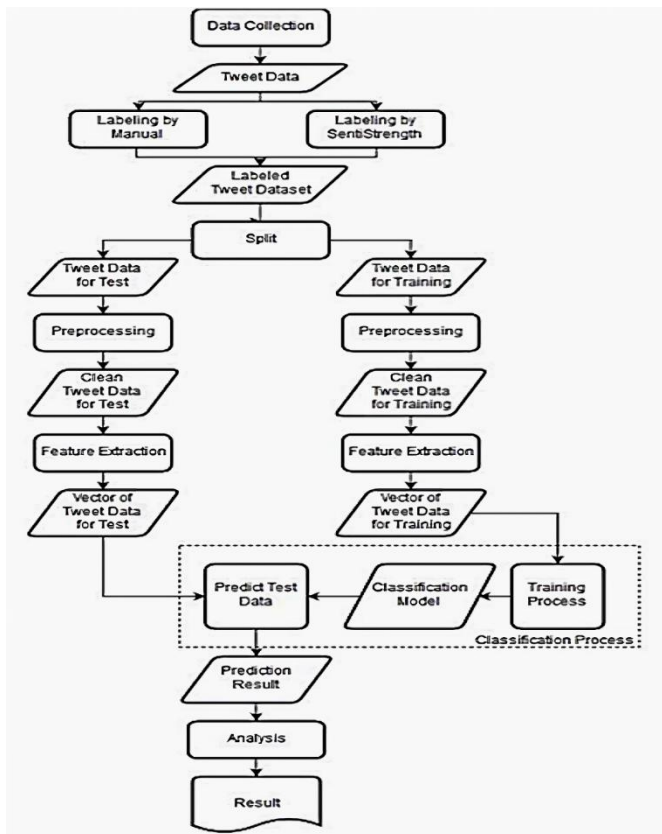


Figure 2. SentiStrength model (Prastowo & Yuniarno, 2019, p. 382)

This shows how SA is an effective mode of longitudinal monitoring of CS. SA was carried out automatically with the SentiStrength software (Prastowo & Yuniarno, 2019). SentiStrength is, therefore, a tool that allows us to calculate the sentiment and the analysis of the text directly from the internal function of the computer prompt commands, as shown in Figure 1.

The mode of operation of SentiStrength is to make a match between the input text, then the tweets of Trenitalia users collected in a file .csv, and the inner vocabulary. Technically, the operation of the software is shown in Figure 2, where the modelling of Prastowo and Yuniarno (2019) is reported.

Specifically, the model represents the representation of a training phase of the software. For the present research, it is interesting to note the phases of an automatic SA, summarized in:

1. data collection of corpora (textual data),
2. stemming and data cleaning phase,
3. automatic analysis, and
4. results, or the conversion of the text into a score that indicates a polarity (positive, negative, or neutral), based on the match with the weight of the words present in the internal vocabulary.

The weight scale given to words in the internal vocabulary ranges from +5 to -5, where +5 is extremely positive and -5 extremely negative. The average scores indicate neutrality, understood as the absence of sentiment or mixed emotions in the same document (for example positive and negative in the same tweet). The score depends, therefore, on the vocabulary. Interesting is the reference to the headwords that make up the internal vocabulary. It must be specified that the vocabulary can be continuously updated, downloading them from the official website of SentiStrength. There is a downloadable vocabulary for all languages, in this specific case, the Italian language will be used. Examples of internal vocabulary include booster words, emoticons, idioms, English words used in Italian, ironic terms, negations, question words, slang. An example of vocabulary and weight given to words is shown in Figure 3, where the vocabulary of booster words is reported.

The output is readable .txt file by converting it to Excel, where the polarity is returned for each document, with words highlighted in red for negative polarity, in green for positive polarity and in grey for neutrality. In the study, it is started from the polarity per year and two other quantitative aspects were studied, that is, the most frequent words used and the dependence of the polarity on the year, then on the historical period, or the context. These analyses were conducted with the statistical R software (Konietzschke et al., 2015). To verify the dependence between the variables, the chi-square statistic has been applied. The frequency of words and the dependence between the variables is an important datum to analyze qualitatively the motivation of the polarity obtained with SA and, above all, in case of the dependence of the sentiment from the year, it is possible to reconstruct the context of the enunciation of the twitted text.

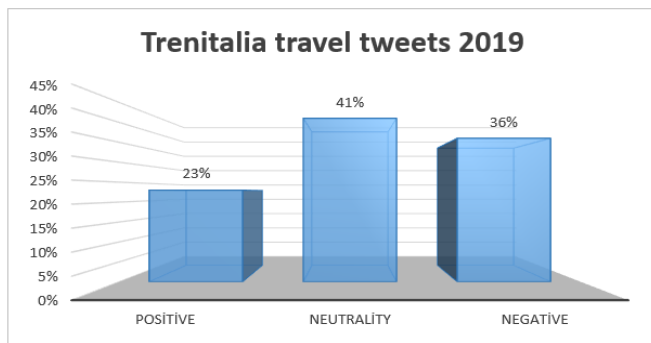


Figure 4. Output sentiment analysis tweets 2019 (Source: Author)

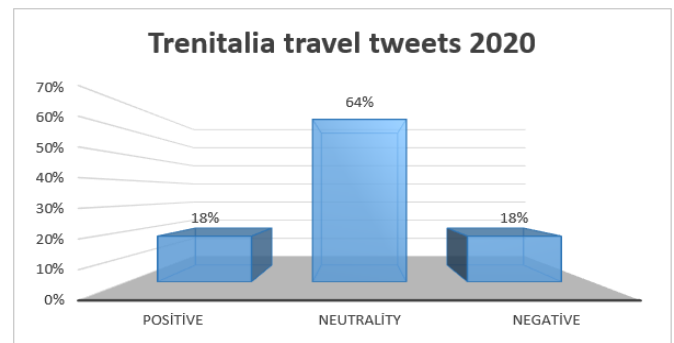


Figure 5. Output sentiment analysis tweets 2020 (Source: Author)

Table 1. Examples of negative, neutral and positive 2019 pre-COVID-19 tweets

Examples	Sentiment
Why #trenitalia decides to <b>change</b> the train numbers at random? <b>To confuse</b> people?	Negative
#trenitalia now I <b>hate</b> you every trip with you is a <b>disgrace</b> . What a pity that this time I could not book #italo!!	Negative
All I have to do is <b>fix</b> the last few things, and I can close the bags. I know that tomorrow I will arrive in Padua with my back in pieces, I <b>know</b> it, I feel it #vacanzeitalia #trenitalia.	Neutral
Six of the morning. Train born in Rimini, announced to Pesaro with 20 minutes <b>late</b> . <b>Thanks</b> to #Trenitalia <b>you always start well</b> .	Neutral (given by contrast between positive and negative polarity)
<b>First birthday gift</b> . Thank you #Trenitalia. We had great contrasts in the past, but I appreciate the gesture.	Positive

Table 2. Examples of negative, neutral, and positive 2020 COVID-19 tweets

Examples	Sentiment
On the train air conditioning ball and <b>people without mask</b> or better kept under the nose. Yes! #Fase2 #trenitalia #coronavirus #vacanzeitalia.	Negative
Because one <b>mask</b> is not enough on #trenitalia #restoinitalia #vacanzeitalia.	Neutral
... desert parking, empty compartment, <b>train on schedule</b> #vacanzeitalia #trenitalia...	Positive

## RESULTS

As for the results of SA, it can notice a prevalence of neutral polarity both in the tweets of 2019 and in those of 2020. A smaller gap between the polarities is noted in 2019, as can be seen from Figure 4.

As it can see from Figure 4, there is a 41% of neutrality, 36% of negativity and 23% of positivity for Trenitalia travel tweets 2019. Examples of negative, positive and neutral tweets for 2019 are represented in Table 1.

Also in the tweets of 2020, there is a prevalence of neutrality, but with greater disparity compared to negativity and positivity, which are found to have the same percentage, as shown in Figure 5.

As it can see from Figure 5, there is a 64% of neutrality, 18% of negativity and 18% of positivity for Trenitalia travel tweets 2020, as shown in the following examples for negative, neutral and positive tweets, reported in Table 2.

The presence of neutrality prevalence can be interpreted as the absence of sentiment or a mixed emotionality, composed of positivity and negativity in the same document. First of all, the comparison between the two years shows immediately the numerical difference between 2019 and 2020 in tweets posted to travel with Trenitalia. This additional element may depend both on the historical period and on the user's perception of the tweet read. Opinions on Twitter can reach a large number of people, namely other users. When, however, the audience is a company, therefore a body and not a user, a representation of the audience emerges from the Twitter user and the Trenitalia service. In this regard, Perelman and Olbrechts-Tyteca (1958) highlight the importance of the audience at the centre of the argument. The

audience is a heterogeneous set of people, who have different beliefs, values, and expectations. For this reason, the speaker or the writer needs to know the audience and the means of communication used to hold on to the feelings of the recipients. The authors distinguish three types of audience:

- the universal audience, whose members have different opinions and needs, often irreconcilable. He who speaks or writes, therefore, must show valid arguments of what he affirms and provide authentic motivations independent of space and time,
- the audience formed by a single listener, these can actively participate in the argument or can be a silent subject; in this case, it can be universal or particular, and
- the audience represented by the subject, it is the case in which the subject-to-argument presents to itself the reasons of its behaviour or tends to justify acts that can be the object of criticism.

In the case of Trenitalia, it is possible to hypothesize the existence of an audience formed by a single listener, that is the company, which is a silent subject. This may push users to consider the Twitter channel, not as a virtual place to communicate their satisfaction or dissatisfaction to reach the company itself, but a place to share with other users their satisfaction or dissatisfaction. Starting right from the prevalence of neutrality, it is necessary to understand what the context of enunciation within which tweets are inserted. Using software R, the word frequencies of the year 2019 and the year 2020 were calculated. In the case of 2019, the most frequent word is "delay" (*'ritardo'*), as shown in Figure 6.



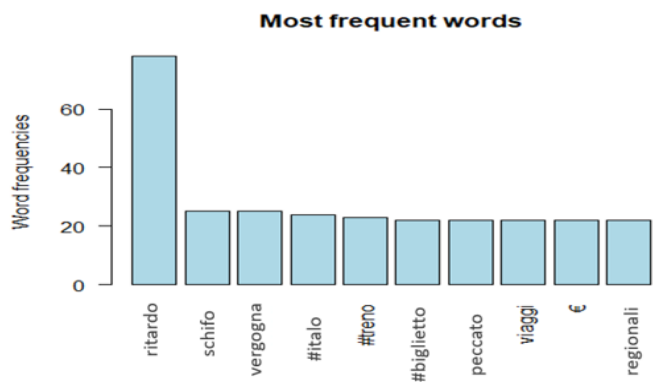


Figure 6. Most frequent words 2019 (Source: Author)

Other repeated words refer to moral aspects, such as “shame” (‘vergogna’) for the service provided and “disgust” (‘schifo’). To shame and disgust, for example, the software attributed -4 as weight, so a pretty negative sentiment. From the frequencies of words of the year 2019 it can understand how the neutrality of sentiment, in reality, depends on mixed emotions present in the same document. In this case, in 2019, reference is made to the poor quality of service.

In 2020, however, the use of words more tending to neutrality, such as the hashtag “Trenitalia” or “trains” is noted, as shown in Figure 7.

It is interesting to note that the symbol of the euro is a frequent word both in 2019 and in 2020. It is a neutral word, as it is a symbol, especially if contextualized. Shooting the tweets where the symbol is contained, it can see that everyone is part of the trip in summer 2019 and 2020. In this period, users report the excessively expensive price of rail travel. Another common word is the “Italo” hashtag. Also in this case, the word is neutral, but contextualized again shows the negativity of the service offered by Trenitalia. The users, in any season in both years, announce that in the future they will prefer the service of Italo, a well-known Italian transport company, a competitor of Trenitalia.

In this regard, it is wondered if there is a dependence between the year (2019 and 2020) and polarity. In this part, the following assumptions have been made:

1. **H0:** The polarity is independent of the year and, therefore, from the context and
2. **H1:** The polarity is dependent on the year and, therefore, from the context.

Calculating  $\chi^2$  shows the dependence of polarity on the period of writing tweets ( $\chi^2[774]=17.99$ ;  $p<.001$ ). This means that there is a significant difference in polarity according to 2019 and 2020. Verified the dependence of the results of SA concerning the years, we wonder if the observed difference is not due to chance but that, instead, there is a diversity between the averages of the sentiment of years (2019 and 2020).

1. **H0:** The polarity difference in years is due to the case and
2. **H1:** The polarity difference in years is not due to the case.

A paired sample t-test is then applied, with a comparison between the average polarity. The analysis returns a t-test value of 0.504, with  $df=98$  and a  $p=0.01$ , which shows strong evidence to reject the null hypothesis. This result is interpreted as a difference in polarity in years not due to chance, confirming the significance of the  $\chi^2$  result. This result confirms that the sentiment calculated by the software is significantly linked to the historical period lived and not to the service

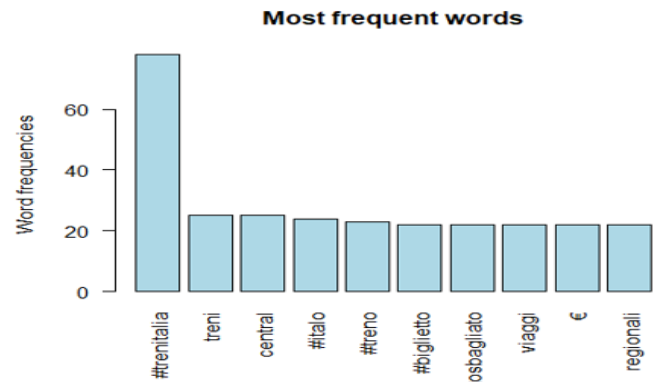


Figure 7. Most frequent words 2020 (Source: Author)

offered by Trenitalia. This quantitative figure has been explored qualitatively, since the software returns a neutral polarity in both cases, it is important to support quantitative analyses, with qualitative ones.

The analysis carried out provides for the identification of mitigation strategies on the results of Trenitalia. This is because tweets are linguistic facts of which it is necessary to know the operation considering the context and how the text is written. The context recalls the pragmatic dimension, while the ways of writing a tweet evoke the stylistic dimension. As in spoken language, even in the publication of tweets, users implement changes in the strengthening or attenuative direction, using the resources put to the provision by the natural language and by the social group of reference.

The opposite variation to accentuation or strengthening is mitigation (Caffi, 2013). The positive or negative value of both variations depends on the enunciation context, but the accentuation may be positive in case of empathic communications and may be negative in case of conflicts; mitigation, on the other hand, is useful in courtesy communications, but it can show a sense of speaker uncertainty. In particular, in the Trenitalia tweets it is possible to notice a greater presence of accentuation, but also a consistent number of mitigators falling within the functional technique: specifically, there is massive use of indicators of enunciative design (screens). Among the enunciative mitigation indicators, the most used is narrative and dramatization with the use of direct speech.

Example of the narrative is:

“Capo Bonifati Cs. Stazione senza personale, nel mezzo del nulla. Sul regionale, capotreno fa pagare 5 euro di sovrattassa per bigl. #trenitalia [Capo Bonifati Cs. Station without staff, in the middle of nowhere. On the Regionale, capotreno charges 5 euro surcharge per ticket #trenitalia].”

Example of dramatization is:

““Biglietto per favore” “Tenga” “Non va bene” “Parli con la sua collega di Pescara. Questo m’ha dato”. Il controllore se ne va. #Trenitalia [“Ticket please” “Here you are” “No good” “Talk to your colleague from Pescara. That gave me”. The controller leaves. #Trenitalia].”

Another very numerous category in Trenitalia’s tweets is that of the total substitutes, which are included in illocutor mitigation indicators (hedgerows). In particular, many rhetorical questions are used. Example of rhetorical questions is:



“Trenitalia sciopero nazionale la vergogna di essere italiana come voi. Mi da-te voi i soldi che perdo per non essere al lavoro? [Trenitalia national strike the shame of being Italian like you. Do you give me the money I lose for not being at work?].”

Much used by users is also the mitigation with the side effect, specifically, there are numerous strategies of fictionalization, that is, the entanglement of irony or parody of the current situation. Example of a restriction:

“Ringraziamo #trenitalia per questa sauna viaggiante-volgarmente detta “treno”- che ci ha fatto risparmiare il viaggio alle terme #mannaggiaate [We thank #trenitalia for this travelling sauna -commonly called “train”- that saved us the trip to the spa #mannaggiaate].”

The users, with these strategies, aim to obtain a cognitive and emotional detachment from the linguistic act. This would explain the recognition of neutrality as a prevalent sentiment. Starting from the reconstruction of the enunciation context, it is possible to notice differences between the two summer seasons. For example, although there is a high occurrence of the word ‘shame’ (*vergogna*) both for the summer 2019, both for summer 2020, but with a lower frequency in 2019. The problems detected by Trenitalia users during the summer, such as excessive air conditioning of the carriages, they attenuate in the 2020 tweets. This may be due to the fact that, in 2020, air conditioning was not a major factor for travel. The decrease or absence of air conditioning was experienced as a lowering of the risk of getting sick and exchanging the symptoms of a possible cold with those of COVID-19.

The analysis of the context also reveals differences between one year and the next. 2019 has more tweets than trips with Trenitalia in the summer. In 2020, travel decreases due to the onset of the COVID-19 epidemic. This would explain the difference in the number of tweets in 2019 and 2020. In 2019, especially in the last period, there are tweets with a positive sentiment that refer to the beginning of sanitization and cleaning of trains, as shown in the following example:

“Finalmente #Trenitalia pulisce le carrozze ed inserisce i dispositivi di sicurezza, finalmente si viaggia #sicuri [Finally #Trenitalia cleans the coaches and inserts the safety devices, finally we travel #safe].”

Although the use of intensifiers, such as the repetition of “finally”, loads the tweet of positivity, the meaning is not oriented to a positive message. The user states that Trenitalia is cleaning the coaches only after the beginning of what would have been a health emergency. This means that, in other periods, the carriages turn out to be dirty.

Based on these results, the mixed methodology has made it possible to understand that there are differences in the period of tourist mobility pre-COVID-19 and during COVID-19. The presence of veiled rhetorical strategies and mitigators in 2019, pre-COVID-19 period, indicate the intent of travellers to hit the Trenitalia service mainly with irony, for example:

“Un viaggio non è vero viaggio senza il disagio di #Trenitalia [A journey is not a real journey without the discomfort of #Trenitalia].”

In 2020, that is in the period COVID-19, instead, the negatively polarized issues have focused no longer on the service itself, but on non-compliance with the rules of personal protection (such as not wearing the mask or not wearing it properly). So, the focus of attention of travellers has shifted from the service itself to the responsibility of the company in enforcing the rules of personal protection.

In general, the results show that SA is a good methodology of analysis of the online reputation and CS of a company that deals with tourist mobility. One should, however, think of mixed methodologies (quantum-qualitative or which-quantitative) so that the result is understood by the company to identify the strengths and intervene on the weak points of the service. In particular, from this mixed methodology it is possible to note two cultural aspects concerning tourist mobility before and during the pandemic. The search for clean and cheap spaces are two important requirements present both in 2019 and in 2020. The need for safe travel, however, is accentuated in 2020 in which Italy was recovering from the period of the first wave of COVID-19 infections. Indeed, the safety and security need helped visitors to have greater trip satisfaction (Tasci & Boylu, 2010, p. 189).

## DISCUSSION AND CONCLUSIONS

The digitization of tourism also leads to increased control by companies of their online presence, its online reputation, and CS, above all in a delicate period as the COVID-19 pandemic. SA is an innovative methodology that helps in the calculation of online reputation and CS, based on an emotional dimension of CS. Methodology, which is part of SC, allows extrapolating a polarity (positive, negative, or neutral) from textual data.

To assess the effectiveness of this methodology, the research is proposed the study of an Italian case, namely Trenitalia, a leading company in rail transport. This study, conducted on tweets posted by Twitter users, aims to examine how talks about the transport service offered by Trenitalia. Until now, traditional tools, such as questionnaires (Della Corte et al., 2015) or interviews (Koc, 2006), have always been used to detect CS in tourist mobility. Another objective that the research aims to achieve is to prove that, based on the sentiment (positive, negative, or neutral) companies can obtain important information about the points of strength and weakness of their service or product, monitoring two different periods. In the research, the following research questions and hypothesis were formulated:

1. **RQ1:** How much the review of a tourist mobility service can be affected by the period in which you travel?
2. **RQ2:** Starting from the results of RQ1, we wondered if a mixed methodology of analysis of CS, i.e., SA, can be an optimal strategy to capture all the multidimensionality of the construct of CS.

### Hypothesis

1. **H1:** There is a dependence between the calculated sentiment indicating the satisfaction of Trenitalia’s customer and the travel period (pre-COVID-19 period vs. COVID-19 period).
2. **H2:** In case of dependence, this is not due to the case.
3. **H3:** In case of non-random dependence, the mixed methodology can be a useful strategy to consider the multidimensionality of CS in tourist mobility.

A total of 674 tweets for the tourist season 2019 and 100 tweets for the tourist season 2020 were collected. The methodology is the application of SA that produces quantitative and qualitative results.

For the quantitative part, the sentiment was calculated first automatically via Sentistrength software, then an extraction of the frequencies and calculation of the dependence and significance (chi-square statistic and t-test statistic) between year and polarity was conducted with R, statistical software. From SA a prevalence of neutrality emerged in both 2019 and 2021 (41% vs. 64%). Neutrality, however, is linked to the presence of mixed emotions in the same document. It becomes, therefore, necessary, the frequencies' extraction to understand, which are the words most used by the users, and which have a positive or negative polarity. From the most frequent words, a prevalence of negativity emerges with the use of "shame" or "disgust" for 2019 and neutral words such as the symbol of the euro or references to the competitor company of Trenitalia. Even this reference, for example, although it is neutral, refers to a tweet in which, due to Trenitalia's failures, users report that they prefer the other transport company for their journeys. Based on these results, it is understood how important it is the context of enunciation within which sentiment fits (RQ1). Starting from these findings, from the chi-square and t-test statistic results emerge the significant relevance of the historical period (context) in which the way of travel changes. This, however, makes it important to explore the data from a qualitative point of view. It is calculated the framework to verify the dependence of sentiment from the year (2019 and 2020), or the contextual historical period in which users tweet. It emerges, in fact, the dependence between sentiment and years of tourist mobility (H1) and this does not depend on a random calculation, but on the real dependence between year and CS (H2). For this reason, it qualitatively reconstructs the meaning of the tweet starting from the intertwining between the text and the context, to understand the sentiment. The results of the qualitative analysis indicate the use of different mitigation strategies. The users, with these strategies, aim to obtain a cognitive and emotional detachment from the linguistic act. This would explain the recognition of neutrality as prevalent sentiment, but also the presence of an audience, such as the company, which on Twitter, turns out to be silent and not responsive. Besides, starting from the reconstruction of the enunciation context, it is possible to notice differences between the summer and the two touristic seasons. For example, although there is a high occurrence of the word 'shame' ('vergogna') both for 2019, both for 2019, but with a lower frequency in 2019 than in 2020. The problems detected by Trenitalia users during 2019, such as excessive air conditioning of the carriages, were attenuated in the tweets of the 2020 period. The analysis of the context also reveals differences between one year and the next. 2019 has more tweets than trips with Trenitalia in the summer. In the summer period of 2020 travel decreases due to the COVID-19 epidemic. The result can be interpreted either as a decrease in tourist mobility in 2020 linked to the period of restrictions of the pandemic or as a change of focus of customers from the service itself to failure to comply with the rules of individual protection. In contrast to studies on the relationship between emotionality and experience of using the tourist service (Loureiro & Kastenholz, 2011), which identify positive emotions related to satisfaction, this study shows that even negative emotional polarizations, like disgust, can be important results, if contextualized according to the historical period that determines the travel conditions.

Indeed, from the results, it is demonstrated that SA is a good methodology of analysis of the online reputation and CS of a company, like Trenitalia (H3). One should, however, think of mixed methodologies (quanti-qualitative or quali-quantitative) so that the result of the study is understood by Trenitalia to identify the strengths and intervene on the weak points of the service. Getting a negative sentiment is not necessarily a sign of a bad reputation, but it becomes a means of understanding what the company needs to work on to offer a satisfactory service (RQ2). However, the results obtained derive from the procedures of a SA software, which being based on a merely lexical analysis, has striking limitations by effect attribution of an incorrect sentiment to some meanings. It has been shown as a difficulty that the software algorithm might encounter in attributing sentiment by homonymous and ironic words. An example of an incorrect result regarding homographic words is the attribution of negative sentiment equal to -2 to the Italian word "mostri" ('show me'), in the imperative form of the verb "to show", confused with "mostri" ('monsters'). Rhetorical strategies such as irony or humour, however, are not recognized, as it is entrusted with a positive sentiment, while the communication intends to hit negatively: this should be a limit of SentiStrength. In fact, in these cases of homography or veiled rhetorical strategies, the software does not attribute the right polarity. For this very reason, a mixed methodology becomes necessary, to recreate the connection to the enunciative context.

The attribution of the sentiment carried out by the tool turns out to be an automatic process and aseptic that prescind from the recognition of equals in the graphic aspect but is different in the meaning. This study could provide a basis for future research perspectives. This it is proposed, for example, to try to analyze the same data with other software of SA, to evaluate how to eventually improve and customize vocabulary internal words or estimate the reliability in the recognition of terms and the attribution of sentiment in different software.

Finally, a strong point with research shows that SA is not a simple automatic methodology. Instead, it is a question of interpreting a numerical value by contextualizing it in the text. It is possible, in fact, to detect an important contextual difference between the two years, that is the need for security, culturally framed as "cleanliness" and "economy". This has practical implications, as, the Italian transport service can start from these values to satisfy its customers and improve tourist mobility. Working on the strengths and weaknesses of the service, traced with a quanti-qualitative methodology, becomes, for the tourist transport company, the topic on which to work for its marketing campaign. Beyond some inaccuracies in the calculation of sentiment, the limit exceeded with the qualitative deepening, the search has not introduced particular limits. Among the future prospects, there will surely be the application of SA with the aforementioned software with big data to evaluate the performance of the methodology in the calculation of CS.

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## Adolescence and sex education: Socio-cultural and psycho-theoretical perspectives

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### ABSTRACT

Sex education has become an important issue in human development and attracts a lot of debates day in and day out. This article situated itself on the socio-cultural perspective of adolescent sex education espousing permissive and restrictive social-cultural dimensions. The article again confined itself to psycho-theoretical perspectives by dwelling on Freud's psychosexual theory, Eriksson's psychosocial theory, Skinner's operant conditioning, as well as Bandura's social learning theory. All theories are comprehensively reviewed based on their views on adolescence and sex education. Psychosexual theory views sex education as a construct that can be nurtured in the early years of life, psychosocial theory views sex education as a construct that can occur through societal interactions, operant conditioning considers sex education as capable based on behavioral consequences, and social learning views sex education as something that can be modeled.

**Keywords:** sex education, adolescence, socio-cultural

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### INTRODUCTION

Sex education is becoming a common song being sung by many in the ever-developing and changing world of today (Walker & Sleath, 2017). By definition, sex education is an educational programme designed to cover all aspects of human development that is aimed at equipping the individual with the right information to safeguard the self and take decisions for the self (Leung et al., 2019; Nasheeda et al., 2019; Thomas & Aggleton, 2016).

According to Kearney (2008), sex education is the involvement of schools in an inclusive course of action aimed at instilling socially desirable attitudes, practices, and personal conduct in adolescents and adults, where these will best protect the individual as a human and the family as a social institution. As a result, sex education can be defined as a programme that teaches students about the elements of human sexuality, including family planning and reproduction. Body image, sexual orientation, sexual pleasure, values, decision-making, communication, dating, relationships, prevention of sexually transmitted infections, and birth control methods are all included in sex education (Kearney, 2008).

Since time immemorial, adolescence as a phase of human development is being embraced by many in societies and other secular environments or settings. Adolescence is just a step before adulthood and, as such, the attention it generates from varied perspectives is well

called for. There are many areas in adolescence that growth and development experts touch on, however, a more pressing and contemporary is the issue of adolescent sex education. Every parent would want the child to progress smoothly in adolescence, but this wish comes with a challenge in today's world due to sex education (Johnson & Johnston, 2020).

Many parents would take it a fancy to discuss with their adolescent children concerning sex education during adolescence because it is a developmental feature, yet there is always the fear of exposing adolescents to information that may be seen as inappropriate in face value, hence parents recoil (Exalto, 2019). The least or mere mention or discussion of issues related to sex education is sometimes tagged as taboo or contempt for social norms and values (Tupper, 2014). All these are evident and speak ill about sex education but on the blindside, sex education in some situations is socio-culturally as well as psycho-theoretically embedded to serve as bases in teaching the positive values in children who would one day in life draw on such information to themselves as they enrol into relationships (courtship, marriage, etc.) (Tupper, 2014).

Many scholars have had their bit about the pandemonium and these scholars are not limited to societal/cultural figures with their varied values as well as cultural norms and theorists in the field of psychology (Metusela et al., 2017). This article dwelled on the socio-cultural and psycho-theoretical perspectives on adolescent sex education.

### **A Socio-Cultural Perspective on Sex Education in Adolescence**

Virtually, all human beings are the same about acquiring knowledge, but how the knowledge is acquired is what makes people somewhat different. They may differ in one way or the other as a result of cultural differences, geographical area one lives in and the environment one may find himself or herself in. Variations in acquiring information spread to areas of sex education. It is believed that some cultures allow sex education while others frown upon it (Felix, 2019).

According to Cabezas (2018), the vast majority of human beings have engaged in sexual relationships at some point in their lives. However, every society has its own interpretation of sexuality and sexual activity. Adolescent sexual knowledge is influenced by a variety of social and cultural factors posited by Abdelghaffar and Siham (2019) and that the sociocultural backdrop of society, which encompasses all social and cultural forces ranging from politics and religion to the mass media, not only shapes societal standards but also gives conservatism a prominent place within them and that in terms of sex education, norms dictate what is deemed acceptable behavior and what is considered normal or bearable (Al-Muneef et al., 2013).

According to Rios-González et al. (2018), children's sexual socialization begins at home, where parents have the chance to highlight their most strongly held beliefs and standards. Children are taught about decorum, nakedness, and secrecy from an early age, including gender-specific information about appropriate behavior in the family and society as a whole. Children's concept of their own sexuality is influenced by parental responses to newborn masturbation, displays of physical affection between parents, and training about proper physical contact with others. Learning about religious beliefs, which may include views of sexuality as a wonderful gift and sex as confined to marriage, is part of this sexual socialization process. As a result, such topics are sometimes left ignored in classrooms. Exploring and comprehending the effects of family and community on sexuality, on the other hand, is an important aspect of sex education (Abdul Hamid et al., 2020).

Although parents are considered to be the immediate primary contact of every adolescent, and they are viewed to play immense roles in issues about the adolescents' upbringing, they hardly touch on information that relates to adolescent sexuality and health (Santelli, 1999). Parental monitoring and the quality of parent-adolescent relationships in socialization are strongly influential on adolescents' sexual behaviors. Many teenagers find it difficult to discuss sex education with their parents, and most parents, particularly dads, are hesitant to do so (Bennett et al., 2018). This assertion was confirmed by a study conducted on adolescents' communication with their parents on sex-related topics and the results indicated that not only were they uncommon, but the discussions were commonly limited in scope (Rosenthal & Fieldman, 1999).

Sociocultural views on sex education sometimes come with its ideology and stand. Some cultures are permissive while others are restrictive on adolescent sex education. Cultures that allow the free flow of sex-related issues and education see nothing bad about sex education because most cultures view sex education as a component of the normal development process of an individual and encourage it among their adolescents. Mead (1928), in her research on Samoa Society with 600 adolescent girls concerning culture and adolescent period, reported that adolescence was not a stressful time, compared with the expectation of adolescent "stress" in Western societies. She ascribed the disparity to

cultural differences. She claimed that because they grew up in a small culture with a shared value system, Samoan adolescent girls did not have to deal with a lot of conflicting personal choices and demands, and that this conclusion was based on the observation that Samoan cultural patterns were very different from those in the USA. Adolescence in Samoa society, according to Mead, was a seamless transition, with little emotional or mental suffering, worry, or perplexity over sexuality issues as found in the USA. This referred to a society characterized by a lack of profound sentiments, conflict, phobias, and tough situations. Mead indicated that adolescents are psychologically healthier if they engage in sexual activities with even multiple partners before marital life. Mead, therefore, concluded that this was possible because Samoan girls belonged to a stable, single cultural society, surrounded by role models, where nothing concerning the basic human facts of copulation, birth, bodily functions, or death was hidden from the adolescent.

According to Muuss (1975), rapidity of social change, exposure to various secular and religious value systems, and modern technology make the world appear to the adolescent too complex, too subjective, too unpredictable and too ambiguous to provide him/her with a stable frame of reference. Mead (1928) in describing the personality and sexuality of Samoans posited that the psychology of the individual Samoans is simpler, more honest, and less driven by sexual phobias than the West. She describes Samoans as being much more comfortable with issues such as menstruation and more casual about nonmonogamous sexual relations where all fall under sex education.

On the part of somehow restrictive cultures, discussing issues related to sex is generally accepted because sex education is something that can go a long way to help adolescents' development, but at the same time, such cultures conceive some fears that adolescents in one way or the other may be exposed to information that is not appropriate to their level of growth (Reiss, 1960). In countering such perceived danger, restrictive cultures put modalities in place for treating sensitive subjects like sex education. In some other cultures too, the restriction is based on gender, as it is in the case of the American cultures (Reiss, 1960). According to Reiss, the American culture is predominantly restrictive in its attitudes about sex education when it comes to women and sexuality. It is widely alleged that men are more sexual than women, and the belief that men have or have the right to more sexual desires than women creates a double standard. Reiss defined the double standard as, for example, prohibiting premarital sexual intercourse for women, but allowing it for men. This standard has advanced into allowing women to engage in premarital sex only within loyal love relationships but allowing men to engage in sexual relationships with as many companions as they wish without any restrictive situation (Herold & Milhausen, 2002).

## **THEORETICAL VIEWS ON SEX EDUCATION IN ADOLESCENCE**

### **Sigmund Freud's Psychosexual Theory of Human Sexuality Development**

According to Freud (1925), the human personality is made up of three complimentary elements, Id, ego, and superego are the three. These aspects get integrated as a child progresses through the five phases of psychosexual development namely oral, anal, phallic, latency, and genital.

In each of the five phases of development, the Id-directs children's urges/instincts for pleasure are manifested in distinct places of the body known as the erogenous zone, according to Freud (1925). All stages of development, according to Freud, play a role in the development of behavior and personality. However, for the sake of this study, a premium is given to the last two stages namely: latency and genital, where adolescence begins and more sexuality issues are core, although these stages take precedence over earlier ones.

#### ***Latency (6-12 years of age)***

According to Freud (1925), sexual energies decrease during this stage and children's superegos or consciences begin to grow more. Adolescents begin to act in morally acceptable ways and embrace the ideals of their parents and other influential adults in the community. It is equally the period where children redirect their sexual desires to socially approved activities like sports and casual friendships. But in this, children may understand basically what entails in human sexuality, but society has primed them to ignore the urges/manifestations and concentrate on what is desired for healthy living, which in turn go in consonance with established family and societal norms. This form of education is nothing less than sex education, as children are made not to engage in any immoral sexual acts, but they channel their desires and energies to societal recommended activities.

#### ***Genital (12+ years of age)***

During this stage, sexual impulses resurface based on successful completion of earlier stages where adolescents are expected to engage in inappropriate sexual behaviors that may lead to gender role development, self-identity, marriage, sexual healthy life, and reproduction. Freud (1925) (as cited in Steinberg et al., 2010) indicated that human beings have strong sexual feelings from a very early age, so sex education is vital as the child progresses on the growth ladder. According to Freud, a successful passage through the stages will lead to understanding one's sexuality and vice versa. It is noted that an inability to progress through latency and genital stages is likely to lead to sexual problems such as psychosexual disorders during adolescence through adulthood. These psychosexual disorders may be categorized into sexual dysfunction, paraphilia, and gender identity disorders.

#### ***Sexual dysfunction***

According to Nolen-Hoeksema (2014), sexual dysfunction is a sexual problem described as reduced desire, stimulation or orgasm and lack of pleasure or gratification derived from sex. This is possible in a situation where the negative aspect of sex education is exaggerated or overemphasized and as a result, the adolescent develops a different and prolonged negative perception about sex even if he or she has become an adult and is expected to engage in genuine sexual affairs.

#### ***Paraphilia (a disorder of sexual preference)***

According to Joyal (2014), paraphilia is an unnatural or irregular sexual behavior that does not conform to the established normal standards of sexual behavior by society. This category of sexual disorder shows an abnormal preference for sexual objects that include inanimate objects, wearing clothes of the opposite sex, paedophilia (sex with children), zoophilia (sex with animals), and necrophilia (sex with dead beings). This disorder is likely to occur among adolescents when they are not properly socialized about sexuality, how it occurs and to whom it is directed at and at what time. In a situation where fear is put into children about sex-related issues and eventually they grow with this

fear, such individuals may likely end up going in for those they have power over because rightful sex avenue is being tagged negatively by society.

#### ***Gender identity disorders***

It is a psychosexual disorder that makes people unable to distinguish between one's sense of sexual identity and the biological one. Those affected display uncertainty about their own sexual orientation, difficulty to fine-tune to the normal sexual lifestyle, and a desire to modify their sexual orientation to become part of the opposite sex (Zhou et al., 1995). According to Davidson (2012), social isolation, anxiety, depression, and loneliness are symptoms of gender identity disorders. Although these psychosexual disorders are not life-threatening, they affect adolescents' social and sexual relationships with partners and could cause a reduction in self-esteem. Disorders may result in expressing other unlawful behaviors, so it is therefore prudent for parents and other significant figures to ensure that children are nurtured in a positive way that will aid their progression into adolescence and adulthood smoothly.

In a nutshell, the psychosexual theory of development values the need for sex education in an adolescent's life. It emphasized that successful progression would lead to a sexually healthy personality while the difficulty in progression will lead to psychosexual disorders that many people try to protect against as agents of change in society.

#### ***Erik Erikson's Psychosocial Theory of Adolescence Development***

Erikson (1950) is credited as the main proponent of the psychosocial developmental theory that has its genesis in psychodynamics. As a neo-Freudian, Erikson accepted the fact that there is a part of the mind that is unconscious and is perceived to be responsible for later adolescent life but disregarded its dominance and the notion that any maladaptive behavior that occurs due to repressed experiences in the unconscious mind cannot be reversed or corrected as championed by Freud (1925) in his psychoanalytic theory. Rather, Erikson (1950) opined that human behavior and personality is controlled by the conscious part of the mind so whatever antisocial behavior an individual depicts can be modified through socialization throughout the individual's lifespan.

Erikson (1959) outlined eight stage developmental processes and also accepted the id, ego, and superego proposed by Freud (1925) but he emphasized that the ego makes positive contributions to adolescent development by grasping the right attitudes, ideas and skills at each stage of the psychosocial development. This mastery, for him, helps adolescents grow successfully and become key players in society. During each of the eight stages of Erikson, there is a perceived psychosocial conflict that exists and must be successfully addressed to develop the individual into a healthy, well-adjusted adolescent and adult in the future. Erikson (1959) discussed psychosocial stages and not psychosexual stages as championed by Freud. According to McLeod (2013), Freud was entirely an id psychologist, whereas Erikson (1950) was an ego psychologist. Erikson (1950) emphasized the role of culture and society, as well as internal ego conflicts, whereas Freud emphasized the war between the id and the superego. Erikson (1963) coined the term "crisis" to characterize a sequence of internal conflicts tied to developmental phases, and the way a person resolves the crisis.

According to Erikson (1950), will determine their identity and future development. These crises are psychosocial, according to Erikson



(1963) since they include the individual's psychological demands (psycho) colliding with the needs of society (social). According to Erikson (1963) (as referenced by McLeod, 2013), the ego grows as it successfully resolves social crises. This includes fostering a sense of trust in others, establishing a sense of social identity, and assisting the next generation in preparing for the future. Trust vs. mistrust, autonomy vs. shame/doubt, initiative vs. guilt, industry vs. inferiority, identity vs. role confusion, intimacy vs. isolation, generativity vs. stagnation, and integrity vs. despair are the psychological phases of development postulated by Erikson (1959). Like Freud (1925), all stages in the psychosocial theory propounded by Erikson (1959) have their respective roles inputting the individual into shape towards adulthood. However, emphasis is placed on the fourth to sixth stages as these stages represent the period where issues of adolescence are paramount in Erikson's theory. The stages with regards to adolescent development about sex education are explained below.

#### ***Industry vs. inferiority (6-12 years)***

This stage falls within the early stages of the child where the individual adolescent usually compares the self with others based on the new changes that emerge. According to McLeod (2013), it is a period where primary sexual characteristics of adolescents are seen to be emerging and adolescents begin to like and fancy their new physical looks and learn to appreciate the changes. It can be elaborated that, at this stage, some adolescents may feel handicapped because they can see differences with their sexual development compared to their stage mates, where under normal circumstances they should not feel so. Therefore, it is paramount that sex education is given to them to understand that there are differences in adolescent development, so whatever occurs to their development is what is suitable for the individual adolescent and should be appreciated. According to Erikson (1959), in comparing the self with others, the adolescent may feel a sense of pride and accomplishment because he/she can measure up with those compared. In a similar vein, an inferiority complex can develop during puberty and adulthood if an adolescent is unable to get along with others or has negative experiences at home or with classmates.

According to McLeod (2013), it is a period for adolescents to establish self-esteem, so adolescents must demonstrate specific competencies that society values in keeping themselves neat after menstruation or nocturnal emissions. Adolescents begin to feel productive and secure in their abilities to achieve goals that are acceptable to society when they are praised and reinforced for their endeavors. If parents or teachers do not support and guide this initiative, teenagers may feel inferior, doubt their talents, and hence fail to realize their full potential in terms of sexuality development. Curbing this problem requires the establishment of a balance between opposing views through sex education so that the adolescent can grow to become what is expected of him.

#### ***Identity vs. role confusion (12 to 18 years)***

This stage correlates partly with the genital stage proposed by Freud (1925) and is purely the adolescent period, more specifically, to the puberty years where many adolescents experience pubescence (McLeod, 2013). The most important hallmark at this stage is which a youngster transitions into an adult. It is noted that adolescents at this stage begin to change order, as in becoming independent from dependency and equally looking out for the future in terms of partnership/relationship with co-equal members, and careers and

strive to be the best part of the bigger family or society (Erikson, 1968). This occurs as a result of changes that take place in the individual's development, including sexuality. This period is considered an important aspect in adolescent stage, as the individual is naturally tasked with identifying his or her role and position in society as an adult in later life. According to McLeod (2013), it is believed that the adolescent examines his identity by finding out who he or she is in society in terms of sex. According to Erikson (1968), there are two identities at this stage, namely sexual and occupational, where the main task of adolescents is developing a sense of self and struggling with questions such as 'who am I?' and 'what do I want to do with my life?'

According to Bee (1992), what ought to transpire at the end of this stage is a reintegrated sense of self, what one wants to do or be, and of one's proper gender role. Adolescents are reported to explore many selves to see the one that will be best for them because of the inevitable developmental changes they encounter. Adolescents who succeed at this age have a strong sense of self and can stick to their views and ideals in the face of challenges and differing viewpoints. Adolescents with a weak sense of self and role confusion may arise when they are unconcerned, refuse to make a deliberate search for identity, or are driven to adhere to the views of others, particularly parental aspirations for the future.

It can be understood that adolescents at this stage should be able to differentiate between boys or girls and what that particular differentiation stands for concerning the society in which they may be found. For example, "if I am a boy, what is expected of me with regards to sex education in relation to societal expectation to develop and become a full functioning personality shortly?" "I am a man and, a potential father, what do I do to my sexual development to be understood by members of the society and be accepted? What do I do to control the night dreams that I encounter most often?" These are rhetorical questions that adolescents may ask themselves and as such, societies and families have to consider sex education as a tool to helping adolescents to understand these developmental changes in their lives because hardly such adolescents would confront any adult for information of this sort, although it would be in the right direction if they could, perceived stigmatization from family and society will deter them.

According to Erikson (1968), in a prolonged way, this can be disastrous to their smooth development during the period of adolescence, which is usually referred to as role confusion of adolescent sexuality. In role confusion, according to Erikson's notion, the adolescent becomes visionless because he or she does not understand the stage he or she has reached in life, let alone understanding the value attached to that developmental mark, and eventually the individual may not be able to mature emotionally in the adulthood. Adolescents may know their gender yet lack the capacities to fulfil the demands of the stage because society in a partial way lagged in making sure the boy or girl is well socialized with regards to human sexuality in relation to their gender differences. In the view of Erikson, establishing a balance between identity formation and role confusion is termed the virtue of fidelity.

Dependent on this stage is the ego quality of fidelity; the ability to endure commitments freely pledged despite the unavoidable inconsistencies and confusions of value systems (Gross, 1987). In infidelity, adolescents learn to embrace others and opposing views to the self even if such views go against their understanding because as

humans they are not the same and they present different views on issues on an individual basis. Gross further reports that during this fidelity period, adolescents explore opportunities and begin to form their own identities based on the outcome of their explorations. It is understood that carving a balance between identity and role confusion is not an issue of coercion on the part of the adolescent but understanding of the stage. Since any push or force to establish identity could lead to rebellion in a form of poor or negative identity development and the feeling of unhappiness in the life of the adolescent, and this can be debilitating to later developmental prospects. For Erikson (1968), if parents and friends are supportive to the developing adolescents and allow some volume of experimentation with sex roles, adolescents will likely end up with a cohesive, full identity that expresses who they are and vice-versa and this is possible through sex education.

#### ***Intimacy vs. isolation (18 to 40 years)***

This stage of Erikson's (1963) psychosocial development corresponds directly to Freud's (1925) psychosexual genital stage. This period is characterized by finding solace in terms of love and relationship among peers. At this stage, adolescents explore open affairs that lead to longer-term engagement with someone rather than an immediate family member. This period equally marks the beginning of early adulthood and late adolescence as the adolescent strives to blend the established identity with mutual friendship with others (Erikson). This period of crisis signifies the conflict to resolve the reciprocal nature of intimacy, thus achieving a mutual balance between giving love and support and receiving love and support. Usually, adolescents are preoccupied with the sense of being rejected by the immediate family or the planned group to which the adolescent would want to belong (Erikson, 1963).

According to Wilder (2003), some adolescents are allergic to pain and rejection, so painful that some personalities of adolescents cannot withstand it. Adolescents becoming successful at this intimacy stage are likely to enjoy smooth, healthy and everlasting marital life in the future because sex education has impacted their lives through societal figures such as accommodative friends, parents, family and the culture in totality. On the other way around, if adolescents find it difficult to mingle with others as in intimacy, they become isolated and somewhat repelling to friends. Such adolescents would do everything reasonable to them to destroy anything that blocks or encroaches on their views in becoming isolated. It is believed that a sense of isolation can cause feelings of darkness and worry in the later life of the adolescent because proper socialization with respect to the relationship was not accustomed during the development period.

#### **B. F. Skinner on Operant Conditioning on Human Sexuality Development**

Operant conditioning is about repeating or not repeating a behavior based on the patterns of outcomes of that behavior (McLeod, 2015). An adolescent performs a behavior (operant), and this behavior may be followed by a reward that can be positive (positive reinforcement) or negative (punishment). The reward determines whether the adolescent will repeat the behavior or not, and if it becomes clear that the behavior is positive to the adolescent, the likelihood is that the behavior will frequently be repeated and vice versa. Some rewards are considered to be primary reinforcers; that is, there is something intrinsically rewarding about them (Ferster & Skinner, 1957).

According to McGuire et al. (1965) (as cited in Bartels & Beech, 2016), sex and relationships are instances where operant conditioning can be applied. Humans can be trained to learn a network of finding a willing sex partner at the end of the network, by exploring other opportunities about sex education. Sexual behaviors in humans play dual roles; in learning theory where it can itself be positive reinforcement, and at the same time be a behavior that is punishable (McGuire et al., 1965). It is understood that the principles of operant conditioning can help explain some aspects of sex education. For example, if an adolescent girl repeatedly experiences pain when she has intercourse (perhaps because she has a vaginal infection either due to lack of sex education or natural occurrence), she will hardly want to engage in sexual activity in the future.

According to Bartels and Beech (2016), in operant conditioning terms, sexual intercourse has repeatedly been associated with punishment (pain), and therefore behavior becomes less common in the life of the adolescent girl. Another useful principle in understanding sexual behavior is that consequences, whether reinforcement or punishment, are most effective in altering behavior when they occur immediately after the behavior. They become less effective the longer they are delayed after the behavior has occurred (McGuire et al.).

In a similar vein, a situation where an adolescent is punished, in a form of physical pain inflicted by parents for engaging in premarital sex, this punishment may not eliminate such behavior but rather teach the adolescent to be sneaky or dishonest and engage in premarital sex without being caught. Operant conditioning brought to the understanding, therefore, that sex education is what is needed, by educating the adolescents on positive and negative domains of their behaviors and not necessarily punishment in getting the adolescent desisting premarital sex until he or she becomes mature and engages in sexual matters after marriage. Operant conditioning as a learning theory believes that human sexual behavior can be learned and unlearned at any time in one's life span occurring in childhood, adolescence, young adulthood, or later (Pierce & Cheney, 2004). Therefore, trying to understand what causes certain sexual behaviors and how to treat people with sexual problems can help to understand them more practically.

#### **Albert Bandura's Social Learning Theory on Human Sexuality Development**

Bandura's social learning theory (Bandura & Walters, 1963) is a more advanced version of learning theory that uses operant conditioning as its foundation. This theory acknowledges two processes known as imitation and identification, which are useful in explaining how gender identity and sexual orientation develop as a result of sex education.

Adolescents learn about sex and gender in part through imitation or imitating, according to social learning theory. These teenagers could be copying their parents or other exciting scenarios they've witnessed. Various types of sex education difficulties can be learned through imitation, according to experts. In high school, for example, the most attractive or sexiest girl in the senior class may see that other females are modeling her behavior and clothing. A boy may also watch a film in which the main character's actions appear to attract him, and then try to imitate those actions in his own activities. This emphasizes the importance of mass media as a source of sexuality models that young people emulate and with which they identify.

Once a behavior is learned, its likelihood of being repeated is determined by its consequences, which can be good or negative (Bandura, 1977). According to this notion, if a behavior is not reinforced, the performer is less likely to perform or repeat it. Over time, successful activity experiences build a sense of competence, or self-efficacy, in completing the activity (Bandura, 1982). The notion of self-efficacy has been widely employed in the development of intervention programs aimed at reducing teenage sex-related problems, such as the usage of condoms to prevent the transmission of sexually transmitted illnesses and HIV infection, as well as unintended births (Delamater et al., 2000). These programs provide teenagers the chance to put what they've learned about sex education into practice while also helping them succeed in life. According to the notion, having a sexual self-concept during adolescence is a critical developmental milestone. This is when teenagers strive to make sense of and arrange their sexual experiences in order to comprehend the patterns and motivations behind their sexual behaviors (Andersen & Cyranowski, 1994). According to Andersen and Cyranowski (1994), who cite the social learning theory (Bandura 1969), sexual self-concept not only aids teenagers in organizing their prior experiences, but also provides them with information to draw on for current and future sexual ideas and experiences. Sexual self-concept influences men's and women's sexual behavior, as well as the future development of relationships.

#### Implications for Counselling and Sex Education

1. Since sexual development begins early in the life of a person parents, caregivers and counsellors should guide children to learn about their sexual growth and choose an appropriate word to describe their body parts.
2. In some cultures, it is taboo to display nakedness or mention sex organs in public, hence the youth must be guided against such behaviors in public settings.
3. It is the duty of teachers and the family to teach sex education at home and the school settings according to maturity levels of the individual, hence the sexual behaviors of children must be closely monitored so that observed misbehaviors are corrected early in life to prevent deep-seated problems in the future.
4. Society must accept that sex education is an essential aspect of the socialisation process aimed at making better sexual decisions throughout life of individuals (Schneewind, 2001).
5. The quality of sexual life and behaviors of the individuals and the society can be enhanced through appropriate rewards and punishment systems and mechanisms put in place by the agents of socialization such as counselors, teachers, and religious personalities.
6. Parents and other caregivers must restrict adolescents on the contents they come across on all forms of media, so as not to corrupt their moral standing.

#### CONCLUSION

It is evident from the above that sociocultural and theoretical viewpoints are limitless when it comes to human development. Theories, in general, are transgressing to many fields, and the education of adolescent sex is not left out. Although theories are limited to behaviorism, psychodynamic, and social learning in this context, other

solid theories are equally applicable to the development of adolescents in terms of sexual education.

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