# Social Media Learning in the Light of Communities of Inquiry: A focus on WhatsApp learning

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This paper explores the use of social media specifically WhatsApp for learning by undergraduate students of Arts and Science Colleges. Literature review shows that social media could be used as an instrument for learning in different parts of the world and reflects the advantages and disadvantages of using social media for learning. This paper uses Communities of Inquiry (CoI) model to prove the point that production of knowledge is done through three presences explained by the conceptual model of CoI developed by researcher. Survey questionnaire is used to elicit answers from the undergraduate students. 769 samples from 10 select Arts and Science colleges in Krishna District, Andhra Pradesh, South India, were collected. Nominal and ordinal measurements are used to construct the survey questionnaire. Demographic results presented in this paper show cross-sectional representation of the population. Using results of crosstabulation and Kruskal-Wallis-H tests, 3 sets of significant statements concerning teaching, social and cognitive and learning presences are tested and the results are presented. The paper concludes that results of tests prove that social presence and cognitive and learning presence are reflected more than the teaching presence. The social, cognitive, and learning presences make teaching presence a reality.
**Keywords:** WhatsApp learning, Communities of Inquiry, Focus Interview, Survey questionnaire, Kruskal-Wallis-H test

## Introduction

In the context of electronic learning or mobile learning or online learning or communicating online, Social media such as WhatsApp, Facebook, Instagram and Twitter play a part in learning in times of pandemic or otherwise. Social media learning is new in Andhra Pradesh, India partly because of necessity to keep in touch with the lecturers and classmates and to download class notes. The objective of the paper is to explore the effect of social media on undergraduate students of Arts and Science colleges concerning their learning and test the model of communities of inquiry in the current research where teaching, social, and cognitive presences play a vital role in knowledge production. This paper will answer the question "which of the social media do undergraduate students of Arts and Science Colleges in Andhra Pradesh prefer for their formal classes?" and what makes social media apps an easy to use for learning?

That social media could be used for formal learning is an area of research where significant contribution is made by the following studies: Social media use in learning second language (Miller et al., 2012), ways of studying social media (Larsson, 2015), study on experiential learning using new technologies (Hu, 2015), collaborative learning (Vuopala et al., 2016), studied a question social and teaching-learning connecting or distancing (Yancey, 2017), using social networking sites (SNSs) to improve people's engagement (Haro-de-Rosario et al., 2018), Twitter for teaching and learning (Chawinga, 2016), using Instagram to connect with undergraduates (Salomon, 2013), and International

perspectives on Literacy learning with iPads (Gallagher et al., 2015).

A quasi-experimental analysis on ubiquitous learning vs. electronic learning used a non-equivalent control group configuration as the research tool. There were substantial differences in learning activeness and learning achievement between classes, according to the report (Suartama et al., 2021). The role of social networks in the educational process was investigated, and it was discovered that teachers and students use social media in different ways and the findings inspire researchers to develop new ways for the teachers and students to communicate (Berestova et al., 2020). The aim of another study on using social media to help students improve their knowledge was to make social media an efficient tool for gathering information and learning (Tsvetkova et al., 2021).

**Literature Review**

In the context of social media learning with a focus on WhatsApp, a qualitative study was conducted on instant messaging between teachers and students in Israel, and it was discovered that not all students have cell phones, and that teachers are upset by receiving irrelevant messages in groups (Bouhnik & Deshen, 2014). Another study that looked at the possibilities of using social media apps as a platform for distance learning used mixed methodology to gather information about users' experiences with the app, as well as survey questionnaires and interviews as research methods (Nawaila & Bicen, 2018). The effectiveness of WhatsApp, a social media app, mobile learning and students' knowledge management were assessed using activity theory as a framework. The researcher concludes by listing the advantages of WhatsApp as a tool (Barhoumi, 2020). A study by (Abraham & Fanny, 2019) revealed that 11.7% of lecturers and 22.9% of students at the University of Port Harcourt used WhatsApp for educational purposes. They also discovered that no one had undergone any WhatsApp mobile technology training, indicating that such training is needed.

A research was conducted on lecturers who use WhatsApp to help their teaching activities, and the findings showed that lecturers were unable to break free from the barriers that their pedagogical models had erected (Gachago et al., 2015). Another research of 400 undergraduates discovered that engaging in a class WhatsApp group facilitates collective learning to a large extent. The major problem in class WhatsApp communities, however, has been discovered to be the posting of irrelevant material on the platform (Udenze & Oshionebo, 2020). The experimental group's e-learning method was focused on WhatsApp mobile learning activities, and the research looked at the effect of using WhatsApp mobile learning activities on the achievement and attitudes of online students using mobile devices at the university. To compare the differences between the experimental and control groups, the t-test was used (Amry, 2014).

A qualitative study concluded that the continuous availability of a facilitator and the opportunity to learn at any time and from any place has rendered WhatsApp a fresh and easy platform for teaching and learning activities (Gon & Rawekar, 2017). Analytical descriptive approach was used to perform an insightful study among 36 female students. The results confirmed WhatsApp's ability to improve student learning and motivation, as well as its ability to help students improve their English skills, expand their vocabulary, and learn from their classmates' mistakes (Hamad, 2017). A study focused on Mobile-Learning in Nigerian schools through WhatsApp, Facebook, and YouTube concluded that using these technologies in learning will be of significant advantages to the students and stakeholders in education. They also pointed out the lack of Internet connectivity and regular power supply as factors that militate against M-Learning (Kola & Sunday, 2018).

A questionnaire was used to choose 30 fourth-year MPI students for a recent examination at their university. In the post-pandemic period, researchers discovered that using WhatsApp to boost learning motivation resulted in an increase in online learning (Susilawati & Supriyatno, 2020). According to a study conducted in India, learning through WhatsApp is both exciting and educational. Married students find learning by WhatsApp to be distracting, and they prefer learning in a conventional classroom because it does not interfere with their family time, according to the report (Bansal et al., 2017). A study investigated whether smartphones encourage or discourage learning and used WhatsApp as a case study. The findings revealed that interactive applications such as WhatsApp Messenger improve student performance and also indicate that a hybrid approach combining conventional and technology-assisted approaches may be more successful (Yavuz, 2016).

An experimental study looked at the feasibility of using WhatsApp Messenger as a mobile learning tool to help students improve their writing skills (Fattah, 2015). Another research used a

quantitative study to analyse people's views of WhatsApp's utility in learning. The researcher looked at the following features of WhatsApp: utility, ease of use, learning ease, and satisfaction. Participants gave positive responses to every aspect of the study, according to the findings (Widodo, 2019). Yet another research looked at how often third-year undergraduates used WhatsApp application in campus placement planning. According to the results, WhatsApp can be used as an important platform for out-of-class events such as knowledge exchange, appraisal, conversations, reviews, and flipped classrooms (Nirgude & Naik, 2016).

A study by (Ujakpa et al., 2018) revealed collaboration in teaching and learning at a small university and the findings show that lecturers and students should use course-related humour during interactions to keep slow-paced students interested before they catch up. A new study looked at the use of WhatsApp as a discussion platform in Blended Learning. The study's findings revealed that the online session was focused on conversation, as evidenced by dialogue and interaction among participants (Qamar et al., 2019).

A study conducted by (Nitza & Roman, 2016) reveals a strong positive association between WhatsApp users' accomplishments and their satisfaction, with the higher their accomplishments, the higher their satisfaction. A qualitative study with 60 students who were teacher candidates was taken up by (Sayan, 2016). The researcher concluded that WhatsApp use for improvement of achievement of the course goals had a significant support of the teacher candidates. Thus, the above studies show that WhatsApp becomes an instrument of learning in a teaching-learning context.

*Methods*

Garrison, Anderson, and Fisher explored cognitive presence within communities of inquiry (CoI). They proposed that with adequate teaching and social presence, cognitive presence (i.e., critical, realistic inquiry) can be generated and assisted in a computer conference setting (D Randy Garrison et al., 2004).

In an article, (D. R Garrison, 2007), clarified four issues concerning CoI: 1. social presence's shift from providing socio-emotional support to focusing on group cohesion (from personal to purposeful relationships) 2. cognitive presence's (inquiry) progress from discovery to resolution 3. Understanding of teaching presence (design, facilitation, direct instruction) and 4. the methodological question of the validity of the coding protocol and qualitative transcript study. (D. Randy Garrison et al., 2010) hoped for the next decade to adopt CoI framework adoption. (Dumitru, 2012) described the concepts of solution to problem of group learning as the central concept of community of inquiry (CoI) and stated that CoI created openings toward extraordinary levels of observance to, and engagement of, the communication technologies in education and research.

(Armellini & De Stefani, 2016) recommended an improvement to the Community of Inquiry system based on the trends found in the analysis, which demonstrates social involvement as more dominant within the teaching and cognitive frameworks than the original version of the framework suggested. (Chen et al., 2017) studied two large enrolment courses in the context of CoI and found conventions tend to be a potentially useful method for handling online debates in large groups, according to the results. (Lin, 2004) studied social presence by developing a questionnaire. Lin used factor analysis to study the different factors involved in CoI. She studied 3 factors namely Factor 1: Factor loadings for social presence questionnaire, Factor 2: Social comfort of expressing and sensing affect and Factor 3: Social navigation.

Another study done by (Early & Lasker, 2018) showed that Teaching presence requires both the selection and presentation of appropriate content as well as facilitation and communication that guide students through discovery. According to Swan & Shih, the perceived presence of teachers may have a greater impact on student satisfaction than the perceived presence of peers. Course design can have a major effect on the production of social presence, according to correlations with other course and learner characteristics (Swan & Shih, 2019).

Studying social presence in online communities, (Kear, 2010) concluded that changes in the design and use of communication systems, as well as sensitivity to communication styles within these contexts, may improve social presence in online learning communities. (Michos et al., 2018) looked at two school groups to see if a teacher inquiry model, which is a tool for teachers to research their own practise in a structured way, supported the connection between design and data-informed reflection on TEL (Technology Enhanced Learning) interventions.

A research by (Cleveland-innes & Campbell, 2012) provides evidence of emotions present in online settings, as well as empirical data indicating that emotional involvement can be a key component of an online culture of inquiry. A research by (Lowenthal & Dunlap, 2014) raised questions about

measuring social presence. Their article describes the misalignment that can occur by using the CoIQ and suggests ways to enhance future research on communities of inquiry.

(Shea & Bidjerano, 2010) studied the fourth presence namely learning presence in CoI. Self-efficacy, as well as other cognitive, behavioural, and motivational constructs that help online learner self-regulation, are suggested to be represented by learning presence.

The aim of the paper was to investigate the developmental differences of the three presences (social, teaching, and cognitive) in the community of inquiry context, as well as students' impressions of a community of inquiry, using a variety of qualitative and quantitative data sources (Akyol et al., 2009).

A paper by (Akyol & Garrison, 2011) reflects on the approaches to and results of deep and meaningful learning in online and hybrid communities of inquiry. The findings indicate that cognitive presence in an inquiry group is linked to both perceived and real learning outcomes.

Another study found that CoI could engage most thoroughly, effectively and at the deepest inter-subjective level, the available IT communication researches (Parsell & Duke-Yonge, 2007). Researchers examined WhatsApp for its ability to promote social presence among first-year radiology undergraduate students, and discovered that it possessed all of the characteristics necessary for the production of social presence (Robinson et al., 2015).

Conceptual Model of Communities of Inquiry
Figure 1 – Conceptual model developed by the researcher (appendix 1 attached at the end of the paper)

Explanation: The conceptual framework takes into consideration the student learners and teachers who are central to the learning experience. Both teachers and students are part of a community. They access, connect, invent new ways of learning and they learn from home. In the absence of a classroom, technology plays a critical role in linking students and teachers.

Teachers and student learners connect through social media apps. They use mobile or computer to connect. Student learners obtain practical learning through their teachers, learn new elements in lessons, and participate in learning that is focused on teaching presence. Teachers design courses and facilitate learners using different methods of bringing the learners to experience social, teaching, and cognitive presences. The interactions between these presences make the experiences of teachers and student learners produce knowledge. The researcher developed this model based on the literature review and ideas obtained from communities of inquiry.

A survey questionnaire was administered to undergraduate students with close-ended questions to elicit the responses from undergraduate students. The close-ended questions seek answers such as the background of the respondent and ranking of statements. The data gathering process uses survey research. The quantitative data is analyzed using SPSS. Purposive sampling was used in this case. 769 students filled in the questionnaire as part of the survey. Since we are living in locked down era, part of the survey was taken up using Google form and another part by administering questionnaire to the respondents following covid protocols. Focus interviews were taken from 10 undergraduate students from different years of study. Three sets of statements were put to test using Kruskal Wallis and Mann-Whitney tests to rank the statements. The first set (teaching presence) had 11 statements, the second (social presence) had 15 statements, and the third (cognitive and learning presence) had 11 statements to be ranked by the test. Final results are presented here.

**Results**

The demographic data of the respondents and Kruskal-Wallis-H and Mann-Whitney tests carried out for teaching, social, and cognitive presences are presented here:

Gender: The total number of respondents is 769. Male undergraduate students are 387 (50.3%) and female students are 381 (49.5%) and 3rd gender is 1 (0.1%). The number shows that there is equal distribution of male and female undergraduate students.

Urban, Villages, and Rural towns: There is an interesting mix of urban and rural and the data shows that 38.9% (299) respondents come from urban areas, 46.6% (358) come from villages, and 14.6% (112) hail from rural towns.

District-wise distribution of respondents: The samples taken represent 14 districts of Andhra Pradesh and Other states such as Delhi, Telangana, Karnataka, Pondicherry, Kerala, Delhi, Madhya Pradesh, and Jharkhand. A respondent comes from Nepal. Though the colleges are situated in Krishna district, students come from different parts of the state and country to study here. While 69.61% (536) respondents come from the Krishna district, 12.98% (100) come from the neighbouring district of Guntur. The sample also shows the preference of students to the colleges in and around Vijayawada, Krishna district, Andhra Pradesh.

Education: While 60.9% (468) are from BSc programs, 19% (146) are from BA programs. 20.2% (155) were from BCom programs. 60.9% of the respondents preferring BSc programs just shows that the enormous number of programs are offered under science by the colleges in Krishna District.

Parents' yearly income: 54.1% (416) of the parents of the respondents earn less than Rs. 60,000/year which is just Rs. 5000 per month. 28.1% (216) earn between Rs. 60,001 to 1,00,000 per year. 7.9% (61) parents earn Rs. 1,00,001 to Rs. 2,00,000 per year and 3% (23) earn Rs. 2,00,001 to 3,00,000 per year. While 2.3% (18) earn Rs. 3,00,001 to 5,00,000 per year, 4.6% (35) earn above Rs. 5,00,001. Significant percentage of the undergraduate students come from lowest strata of the income group. The data also show a small percentage 6.9% earn more than 3 lakhs per year.

The professional background of the parents of the respondents: A significant 34.3% (264) of the respondents' parents are either labourers or auto drivers or small business holders or street vendors. 29.5% (227) parents of the respondents are farmers. While 20.3% (156) are private employees, 10.5% (81) are govt servants. A small percentage (5.3%) of the parents are unemployed. The data further shows that students who study in the select colleges mostly come from lower-middle-class and below poverty line families.

Respondents' possession of social media apps: The highest number of respondents 96.7% (739) possess WhatsApp. While 46.81% (380) of the respondents use Facebook, Instagram is used by 54.35% (418) of the respondents. Only 17.22% (133) of the respondents use Twitter. 13% (100) of the respondents possess all the apps namely Facebook, Instagram, Twitter, and WhatsApp. It shows that WhatsApp is the favourite social media app for undergraduate students.

Learning outside the College: The data shows how undergraduate students learn outside the college hours and what sort of material, they use to study their formal subjects taught in the classroom. While 37.2% (286) of the respondents use traditional printed materials, 56.2% (432) of the respondents use smartphones to learn to study. 6% (46) of the respondents use their desktops to study and an insignificant 0.7% (5) of the respondents use iPads to learn outside college hours.

Hours spent on Social Media: The data reveals how many hours per week respondents spend on social media. Although 23.1 percent (178) of respondents spend less than 59 minutes a week on social media, 35.8 percent (275) spend 1-2 hours a week on the platform. 17.1% (131) of respondents use social media for 2.1-4 hours per week, while 9.1% (70) of undergraduate students use social media for 4.1-6 hours per week. It's worth noting that 14.7% (1103) of respondents spend more than 6 hours on social media applications.

Social media posts: The data shows the intent and preferences of the respondents to post on social media. While 10.3% (79) of the respondents appreciate comments on social media platforms, 22% (169) of the respondents wish their friends on a birthday or other important occasions using Facebook. 5.9% (45) of the respondents like certain activities of friends or friends of friends on Facebook and 12.5% (96) of the respondents post pictures on Instagram and put-up status. 49.4% (380) of the respondents share subject content using WhatsApp.

Accessibility and affordability of the Internet: The data at hand shows the status of the respondents concerning internet access. 20.9% (161) of the respondents said that they are not able to access the Internet because they stay in villages. 8.7% (67) of the respondents said that they were not able to access it because they can't afford or pay for the Internet connection. However, 26.7% (205) of the respondents were able to access and they could afford Internet connection and 43.7% (336) of the respondents felt that they can access but the net speed is very slow.

**Kruskal-Wallis-H test statements concerning teaching presence**
Table 1 (appendix-2) below shows Kruskal-Wallis-H for k-dependent samples results. Eleven statements (with ranking statements) with Likert scale were tested using Kruskal-Wallis-H test to determine the rankings of the statements concerning teaching presence. The grouping variable was years of study (First, second and third years). The df for all the variables is 2. The number of samples is 769 (N = 769). Eleven statements under teaching presence were tested and only 4 statements were found to be significantly related because of the lower level of asymp.sig (p) value compared to level of significance (α). The following variables were tested and the results displayed in the table. The test was carried out using SPSS. Case-1 states that the lecturers allow the respondents to think critically and raise relevant questions on different subjects. There is a significant relationship between years of study and the statement because the asymp.sig is lower than the level of significance and the null hypothesis is rejected. The mean for this statement is 2.1235 and standard deviation is 0.79325. Case-2 is a negative statement that says that "my teacher does not design courses properly." Since it has lower p value than level of significance, null hypothesis is rejected so the statement would now read "my teacher designs the courses well." The median for the variable is 4.0000. It has a higher mean value because the statement is negatively worded and the standard deviation is higher than1.08244. In case-3, p value is 0.024 which is lower than α value and so the null hypothesis is rejects. So, the statement 'YouTube teaches respondents more practical lessons than the lecturer in classroom is accepted. The mean value is 2.6541 and standard deviation is 1.14677. The mean value is higher because 50% accept the statement and 27% contradict it and 23% are

neutral. So, the opinion is divided. In case-4, p value is 0.000 which is lower than α value, so null hypothesis is rejected. There is a significant relationship between years of study and 'my lecturer conducts tests using WhatsApp." The mean value is 2.7126 and standard deviation is 1.11307. Mann-Whitney test also confirmed the same results. The results proved that lecturers design courses meticulously and deliver them too. They also prove that lecturers allow students to think critically and raise questions on different subjects in online learning. The third result shows that YouTube videos teach practical lessons to students and the fourth one shows that lecturers conduct online sessions on WhatsApp.

Table 1. Kruskal-Wallis-H test concerning statements on teaching presence (file found in appendix -2 at the end of the document)

**Kruskal-Wallis-H test for Social presence**
The table 2 (appendix-3) below shows Kruskal-Wallis-U test results for the variables. The number of samples is 769 (N = 769) and df =3. Fifteen statements were tested and we found only 8 statements are significant. Asymp.sig (p) value is lower than the level of significance 0.05 (α) for the 8 statements below. So, the null hypothesis for these cases is rejected and so there is a significant relationship between the group variable of status of internet access and the statements in the table. In case-1, the respondents are technical when they use social media, the mean is 2.4330 and SD = 0.89907. 59% of the respondents accept the statement and only 12% reject the statement. In case-2, undergraduate students expect social support from social media from friends and friends of friends, mean is 2.7113 and SD = 1.04577. Higher mean is due to 27% respondents preferring to be neutral, though 48% agree to the statement and 24.4% of the respondents reject it. Case-3 states respondents use social media apps to communicate to friends, lecturers and families. The mean value is 1.9311 and SD = 0.79003. While 87.8% of the respondents accept the statement, 5.8% reject it and only 6.5% are neutral. The mean points to acceptance of the statement. Case-4 shows a mean of 2.8817 and SD = 1.18158. While 47% of the respondents accept the statement, a significant 34% reject it and 18.5% are neutral. So, the mean value is higher and also the SD value. The opinion is divided on the statement though there is a significant relationship based on p-value. Case 5 states that Facebook gives identity. The mean is 3.1964 and SD = 1.11649. While 38.6% reject the statement, 28.9% accept it and 32.5% are neutral. The results indicate that Facebook gives identity to some and do not give identity to others. The relationship between the variables is significant because $p < α$. Case-6 states Facebook gives emotional satisfaction when friends encourage the respondents. The mean is 3.0598 and SD = 1.09405. While 33.6% reject the statement, 33.9% accept it and 32.4% are neutral. The higher mean value is due to rejection of the statement and indicating neutral. The results indicate that Facebook gives emotional satisfaction to respondents when they are encouraged by their friends through their posts. An equal number of respondents don't agree to the statement. The results prove that Facebook posts may give emotional satisfaction to some and some may not feel that way and a significant remained neutral indicating the opinions are divided on the statement. Case-7 states that respondents are on LinkedIn so that they could get a job in future. The mean is 2.7100 and SD = 1.00022. While 42.7% accept the statement, 19.5% reject it and 37.7% remained neutral. In this case, the results show that more respondents are aware of LinkedIn compared to the ones who reject the statement. 37.7% are not aware of LinkedIn. Case-8 shows that respondents use Instagram mostly to share pictures or video messages with friends. The mean for this statement is 2.9571 with SD = 1.25602. While 45.5% agree to the statement, 38.5% reject the statement and 16% are neutral. Fairly good percentage of the respondents use Instagram to share pics or video messages with friends. The higher mean could be attributed to a higher percent of respondents choosing to reject the statement and remain neutral. We conclude that respondents experience social presence of communities of inquiry.

Table 2. Kruskal-Wallis-H test concerning statements on social presence (file found in appendix-3 at the end of the document)

**Kruskal-Wallis-H test for statements concerning Cognitive and Learning Presences**
Kruskal-Wallis-H test for the 11 statements in the section cognitive and learning presence were taken with a grouping variable of "Hours spent on social media per week on social media apps." Table – 3 presents the variables with Kruskal-Wallis-H test values. Case-1 evaluated the difference between the variable 'hours spent on social media per week on social media apps" and 'I learn from my classmates through WhatsApp interactions.' The median is 2.0000 for the test and the mean is 2.1443 and SD = 0.81568. Since the p-value (0.025) is less than α (level of significance), the null hypothesis is rejected and so there is a significant relationship between the 2 variables. Case-2 shows the variable 'I learn from social media posts that I read.' The median is 2.0000 for the test and the mean is 2.1612 and SD =

0.85999. Since the p-value (0.000) is less than α (level of significance), the null hypothesis is rejected and so there is a significant relationship between the 2 variables. Case-3 shows the variable 'I learn additional information about formal subjects using YouTube videos.' The median is 2.0000 for the test and the mean is 1.9337 and SD = 0.80495. Since the p-value (0.034) is less than α (level of significance), the null hypothesis is rejected and so there is a significant relationship between the 2 variables. Case-4 shows the 'variable I apply knowledge obtained from social media in real-life situations.' The median is 2.0000 for the test and the mean is 2.3511 and SD = 0.92506. Since the p-value (0.033) is less than α (level of significance), the null hypothesis is rejected and so there is a significant relationship between the 2 variables. Case-5 shows the variable 'I feel that social media is democratic. It allows me to express myself in different ways.' The median is 2.0000 for the test and the mean is 2.3004 and SD = 0.90543. Since the p-value (0.003) is less than α (level of significance), the null hypothesis is rejected and so there is a significant relationship between the 2 variables. Case-6 shows the variable 'I use social media apps to relax and learn new information.' The median is 2.0000 for the test and the mean is 1.9090 and SD = 0.79026. Since the p-value (0.000) is less than α (level of significance), the null hypothesis is rejected and so there is a significant relationship between the 2 variables. Case-7 shows the variable 'I don't learn anything by using social media like WhatsApp, Facebook, Twitter and Instagram.' It is a negative statement. The median is 4.0000 for the test and the mean is 3.4460 and SD = 1.08734. Since the p-value (0.002) is less than α (level of significance), the null hypothesis is rejected and so there is a significant relationship between the 2 variables. So, the respondents learn from social media like WhatsApp, Facebook, Twitter and Instagram. Learning presence is seen in these statements as respondents take trouble to understand and learn online and get additional information through social media (Kear, 2010).

Table 3. Kruskal-Wallis-H test concerning statements on cognitive and teaching presence (file found in appendix-3 at the end of the document)

**Discussion and Conclusions**

We conclude that the respondents who study in Arts and Science colleges found that their lecturers design the courses adequately and respondents learn a lot by using the course structure given to them. Another conclusion is that undergraduate students believe that the online classes taught through WhatsApp by the respective lecturers are very interesting and lecturers conduct classes on not only WhatsApp but also in Zoom, Google Meet and other apps. A significant finding is that the respondents apply the knowledge obtained from social media to real life situations and another is that they tend to believe in fake messages that go around in WhatsApp and accept that they do not verify the facts most of times.

We also conclude that undergrads communicate with their friends using WhatsApp and they state that they use social media to relax and learn new information. Facebook gives emotional satisfaction and social media empower respondents as citizens by facilitating them to leave comments or messages on specific social media platforms like WhatsApp or Facebook or Instagram.

We conclude that undergraduates learn from their classmates through WhatsApp interactions and Facebook does not give any identity to the respondents. Another conclusion is that respondents raise questions during online classes and they are creative in doing assignments. On the technical front, undergraduate students are able to handle social media apps, create FB page, and are comfortable in handling online classes using WhatsApp.

The general conclusion is that WhatsApp is the most preferred by the undergraduate students for learning especially for connecting with their fellow students as well as the lecturers towards learning. The findings confirm that collective learning is possible (Udenze & Oshionebo, 2020) and WhatsApp mobile learning can be done (Amry, 2014), WhatsApp as an easy platform for learning (Gon & Rawekar, 2017) and the findings also prove that undergraduate students face difficulties in accessing Internet because of poor accessibility and this can be rectified only by high-speed internet (Kola & Sunday, 2018). WhatsApp is a boost to increase online learning (Susilawati & Supriyatno, 2020), both exciting and educational (Bansal et al., 2017), and improved communication between students and faculty (Fattah, 2015). The findings also prove that undergraduate students use other social media namely Facebook and Instagram for learning. The research also proves that students experience teaching, social and cognitive presences in knowledge production. The Kruskal-Wallis-H tests on the 3 sets of statements prove that teaching, social, cognitive and learning experiences could be observed in the respondents as they use technology to learn. While the respondents experience social and cognitive and learning experience more in their lives as students, teaching presence is a bit lower compared to the other presences. One of the most interesting findings is that everyone uses WhatsApp to learn, communicate, and interact with their parents and teachers, regardless of whether they live in a village or a town. There is no digital-divide in the use of WhatsApp whether one lives in a town or village. In the context of new apps like Signal or Telegram or any other

apps which are alternatives to WhatsApp or Facebook or Instagram coming into the market, the question is which social media would they prefer in future? That will make an interesting study.

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**References**

Abraham, O., & Fanny, A. (2019). Social Media in Teaching-Learning Process: Investigation of the Use of Whatsapp in Teaching and Learning in University of Port Harcourt. *European Scientific Journal ESJ*, *15*(4). https://doi.org/10.19044/esj.2019.v15n4p15

Akyol, Z., & Garrison, D. R. (2011). Understanding cognitive presence in an online and blended community of inquiry: Assessing outcomes and processes for deep approaches to learning. *British Journal of Educational Technology*, *42*(2), 233–250. https://doi.org/10.1111/j.1467-8535.2009.01029.x

Akyol, Z., Randy Garrison, D., & Yasar Ozden, M. (2009). Online and blended communities of inquiry: Exploring the developmental and perceptional differences. *International Review of Research in Open and Distance Learning*, *10*(6), 65–83. https://doi.org/10.19173/irrodl.v10i6.765

Amry, B. A. (2014). The impact of WhatsApp mobile social learning on the achievement and attitudes of female students compared with face-to-face learning in the classroom. *European Scientific Journal*, *Volume 10*(22).

Armellini, A., & De Stefani, M. (2016). Social presence in the 21st century: An adjustment to the Community of Inquiry framework. *British Journal of Educational Technology*, *47*(6), 1202–1216. https://doi.org/10.1111/bjet.12302

Bansal, T., Joshi, D., & Singh, G. G. (2017). A Study of Students' Experiences of Mobile Learning. *Global Journal of HUMAN-SOCIAL SCIENCE*, *5*(6), 45–56. https://socialscienceresearch.org/index.php/GJHSS/article/view/1326

Barhoumi, C. (2020). The Effectiveness of WhatsApp Mobile Learning Activities Guided by Activty Theory on Students' Knowldege Management. *Contemporary Educational Technology*, *6*(3), 221–238. https://doi.org/10.30935/cedtech/6151

Berestova, A., Alizade, T., & Umirzakova, Z. (2020). The Role of Social Networks in the Educational Process. *International Journal of Emerging Technologies in Learning*, *15*(22), 121–133. https://doi.org/10.3991/ijet.v15i22.16889

Bouhnik, D., & Deshen, M. (2014). WhatsApp Goes to School: Mobile Instant Messaging between Teachers and Students. *Journal of Information Technology Education: Research*, *13*, 217–231. https://doi.org/10.28945/2051

Chawinga, W. D. (2016). Teaching and learning 24/7 using Twitter in a university classroom: Experiences from a developing country. *E-Learning and Digital Media*, *13*(1–2), 45–61. https://doi.org/10.1177/2042753016672381

Chen, B., deNoyelles, A., Patton, K., & Zydney, J. (2017). Creating a community of inquiry in large-enrollment online courses: An exploratory study on the effect of protocols within online discussions. *Online Learning Journal*, *21*(1), 165–188. https://doi.org/10.24059/olj.v21i1.816

Cleveland-innes, M., & Campbell, P. (2012). Cleveland-Jones - Emotional Presence Learning Online Environ. *The International Review of Research in Open and Distance Learning*, *13*(4), 269–292. http://www.irrodl.org/index.php/irrodl/article/view/1234

Dumitru, D. (2012). Communities of inquiry. A method to teach. *Procedia - Social and Behavioral Sciences*, *33*, 238–242. https://doi.org/10.1016/j.sbspro.2012.01.119

Early, J., & Lasker, G. A. (2018). Strengthening Communities of Inquiry Online and Offline : Exploring the Benefits and Challenges of Including Service-Learning in a Fully Online Women's Global Health Course . *Pedagogy in Health Promotion*, *4*(3), 218–226. https://doi.org/10.1177/2373379917730843

Fattah, S. F. E. S. A. (2015). The Effectiveness of Using WhatsApp Messenger as One of Mobile Learning Techniques to Develop Students' Writing Skills. *Journal of Education and Practice*, *6*(32), 115–127. http://libezproxy.open.ac.uk/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1083503&site=ehost-live&scope=site

Gachago, D., Strydom, S., Hanekom, P., Simons, S., & Walters, S. (2015). Crossing Boundaries: Lecturers' Perspectives on the Use of Whatsapp To Support Teaching and Learning in Higher Education. *Progressio: South African Journal for Open and Distance Learning Practice*, *37*(1). https://doi.org/10.25159/0256-8853/579

Gallagher, T. L., Fsher, D., & Lapp, D. D. (2015). International Perspectives on Literacy Learning with

iPads. *Journal of Education*, *195*(3), 10–15. https://doi.org/10.1177/002205741519500303

Garrison, D. R. (2007). ONLINE COMMUNITY OF INQUIRY REVIEW: SOCIAL, COGNITIVE, AND TEACHING PRESENCE ISSUES. *Journal of Asynchronous Learning Networks*, *11*(1), 61–72.

Garrison, D. Randy, Anderson, T., & Archer, W. (2010). The first decade of the community of inquiry framework: A retrospective. *Internet and Higher Education*, *13*(1–2), 5–9. https://doi.org/10.1016/j.iheduc.2009.10.003

Garrison, D Randy, Anderson, T., & Archer, W. (2004). Critical Thinking, Cognitive Presence, and Computer Conferencing in Distance Education. In *Garrison*.

Gon, S., & Rawekar, A. (2017). Effectivity of E-Learning through Whatsapp as a Teaching Learning Tool. *MVP Journal of Medical Sciences*, *4*(1), 19. https://doi.org/10.18311/mvpjms/0/v0/i0/8454

Hamad, M. M. (2017). Using WhatsApp to Enhance Students' Learning of English Language "Experience to Share." *Higher Education Studies*, *7*(4), 74. https://doi.org/10.5539/hes.v7n4p74

Haro-de-Rosario, A., Sáez-Martín, A., & del Carmen Caba-Pérez, M. (2018). Using social media to enhance citizen engagement with local government: Twitter or Facebook. *New Media & Society*, *20*(1), 29–49. https://doi.org/https://doi.org/10.1177/1461444816645652

Hu, H. (2015). Building virtual teams: Experiential learning using emerging technologies. *E-Learning and Digital Media*, *12*(1), 17–33. https://doi.org/10.1177/2042753014558373

Kear, K. (2010). Social presence in online learning Communities. *Enhancing Social Presence in Online Learning Environments*, 88–116. https://doi.org/10.4018/978-1-5225-3229-3.ch005

Kola, A. J., & Sunday, O. S. (2018). Mobile-Learning (M-Learning) through WhatsApp Messaging, Facebook, and YouTube, Nigeria. *Education Journal*, *1*(October), 111–121. https://doi.org/10.31058/j.edu.2018.13008

Larsson, A. O. (2015). Comparing to Prepare: Suggesting Ways to Study Social Media Today—and Tomorrow. *Social Media and Society*, *1*(1). https://doi.org/10.1177/2056305115578680

Lin, G.-Y. (2004). Social presence questionnaire of online collaborative learning: Development and validity. *2004 Annual Proceedings - Chicago: Volume #1*, 588–591. http://files.eric.ed.gov/fulltext/ED499961.pdf

Lowenthal, P. R., & Dunlap, J. C. (2014). Problems measuring social presence in a community of inquiry. *E-Learning and Digital Media*, *11*(1), 19–30. https://doi.org/10.2304/elea.2014.11.1.19

Michos, K., Hernández-Leo, D., & Albó, L. (2018). Teacher-led inquiry in technology-supported school communities. *British Journal of Educational Technology*, *49*(6), 1077–1095. https://doi.org/10.1111/bjet.12696

Miller, L., Hafner, C. A., & Fun, C. N. K. (2012). Project-based learning in a technologically enhanced learning environment for second language learners: Students' perceptions. *E-Learning and Digital Media*, *9*(2), 183–195. https://doi.org/10.2304/elea.2012.9.2.183

Nawaila, M. B., & Bicen, H. (2018). WhatsApp as a tool for distance learning. *PONTE International Scientific Researchs Journal*, *74*(1). https://doi.org/10.21506/j.ponte.2018.1.36

Nirgude, M., & Naik, A. (2016). WhatsApp Application: An Effective Tool for Out-of-Class Activity. *Journal of Engineering Education Transformations*, *Special Issue*, 1–5.

Nitza, D., & Roman, Y. (2016). WhatsApp Messaging: Achievements and Success in Academic. *International Journal of Higher Education*, *5*(4), 255–261. https://doi.org/10.5430/ijhe.v5n4p255

Parsell, M., & Duke-Yonge, J. (2007). Virtual Communities of Enquiry: An Argument for Their Necessity and Advice for Their Creation. *E-Learning and Digital Media*, *4*(2), 181–193. https://doi.org/10.2304/elea.2007.4.2.181

Qamar, K., Riyadi, S., & Wulandari, T. C. (2019). Utilization of whatsapp application as discussion media in blended learning. *Journal of Education and Learning (EduLearn)*, *13*(3), 370. https://doi.org/10.11591/edulearn.v13i3.8412

Robinson, L., Behi, O., Corcoran, A., Cowley, V., Cullinane, J., Martin, I., & Tomkinson, D. (2015). Evaluation of whatsapp for promoting social presence in a first year undergraduate radiography problem-based learning group. *Journal of Medical Imaging and Radiation Sciences*, *46*(3), 280–286. https://doi.org/10.1016/j.jmir.2015.06.007

Salomon, D. (2013). Moving on from Facebook: Using Instagram to Connect with Undergraduates and Engage in Teaching and Learning. *College & Research Libraries News*, *74*(8), 408–412. https://doi.org/https://doi.org/10.5860/crln.74.8.8991.

Sayan, H. (2016). AFFECTING HIGHER STUDENTS LEARNING ACTIVITY BY USING WHATSAPP. *Ournal, European Vol, Educational Sciences*, *4*(3), 88–93.

Shea, P., & Bidjerano, T. (2010). Learning presence: Towards a theory of self-efficacy, self-regulation, and the development of a communities of inquiry in online and blended learning environments. *Computers and Education*, *55*(4), 1721–1731. https://doi.org/10.1016/j.compedu.2010.09.017

Suartama, I. K., Sulthoni, Ulfa, S., Setyosari, P., Yunus, M., & Sugiani, K. A. (2021). Ubiquitous Learning vs. Electronic Learning: A Comparative Study on Learning Activeness and Learning Achievement of Students with Different Self-Regulated Learning. *International Journal of Emerging Technologies in Learning*, *16*(3), 36–56. https://doi.org/10.3991/ijet.v16i03.14953

Susilawati, S., & Supriyatno, T. (2020). Online Learning Through WhatsApp Group in Improving Learning Motivation in the Era and Post Pandemic COVID -19. *Jurnal Pendidikan*, *5*(6), 852–859.

Swan, K., & Shih, L. F. (2019). on the Nature and Development of Social Presence in Online Course Discussions. *Online Learning*, *9*(3), 115–136. https://doi.org/10.24059/olj.v9i3.1788

Tsvetkova, M., Ushatikova, I., Antonova, N., Salimova, S., & Degtyarevskaya, T. (2021). The Use of Social Media for the Development of Digital Literacy of Students: ... *International Journal of Emerging Technologies in Learning (IJET)*, *16*(2), 65–78. https://www.learntechlib.org/p/218939/

Udenze, S., & Oshionebo, B. (2020). Investigating 'WhatsApp' for Collaborative Learning among Undergraduates. *Etkileşim*, *3*(5), 24–50. https://doi.org/10.32739/etkilesim.2020.5.92

Ujakpa, M. M., Heukelman, D., Lazarus, V. K., Neiss, P., & Rukanda, G. D. (2018). Using whatsapp to support communication in teaching and learning. *2018 IST-Africa Week Conference, IST-Africa 2018*, 1–6.

Vuopala, E., Hyvonen, P., & Jarvela, S. (2016). Interaction forms in successful collaborative learning in virtual learning environments. *Active Learning in Higher Education*, *17*(1), 25–38. https://doi.org/https://doi.org/10.1177/1469787415616730

Widodo, L. (2019). Users' Perceptions of the WhatsApp Usefulness in Learning. *Open Journal for Information Technology*, *2*(1), 1–8. https://doi.org/10.32591/coas.ojit.0201.01001w

Yancey, N. R. (2017). Social Media and Teaching-Learning: Connecting or Distancing? *Nursing Science Quarterly*, *30*(4), 303–306. https://doi.org/10.1177/0894318417724470

Yavuz, F. (2016). Do Smartphones Spur or Deter Learning: A WhatsApp Case Study. *International Journal of Educational Sciences*, *15*(3), 408–415. https://doi.org/10.1080/09751122.2016.11890551

*Appendix - 1*
Figure 1. Conceptual Model of Communities of Inquiry (developed by the researcher)
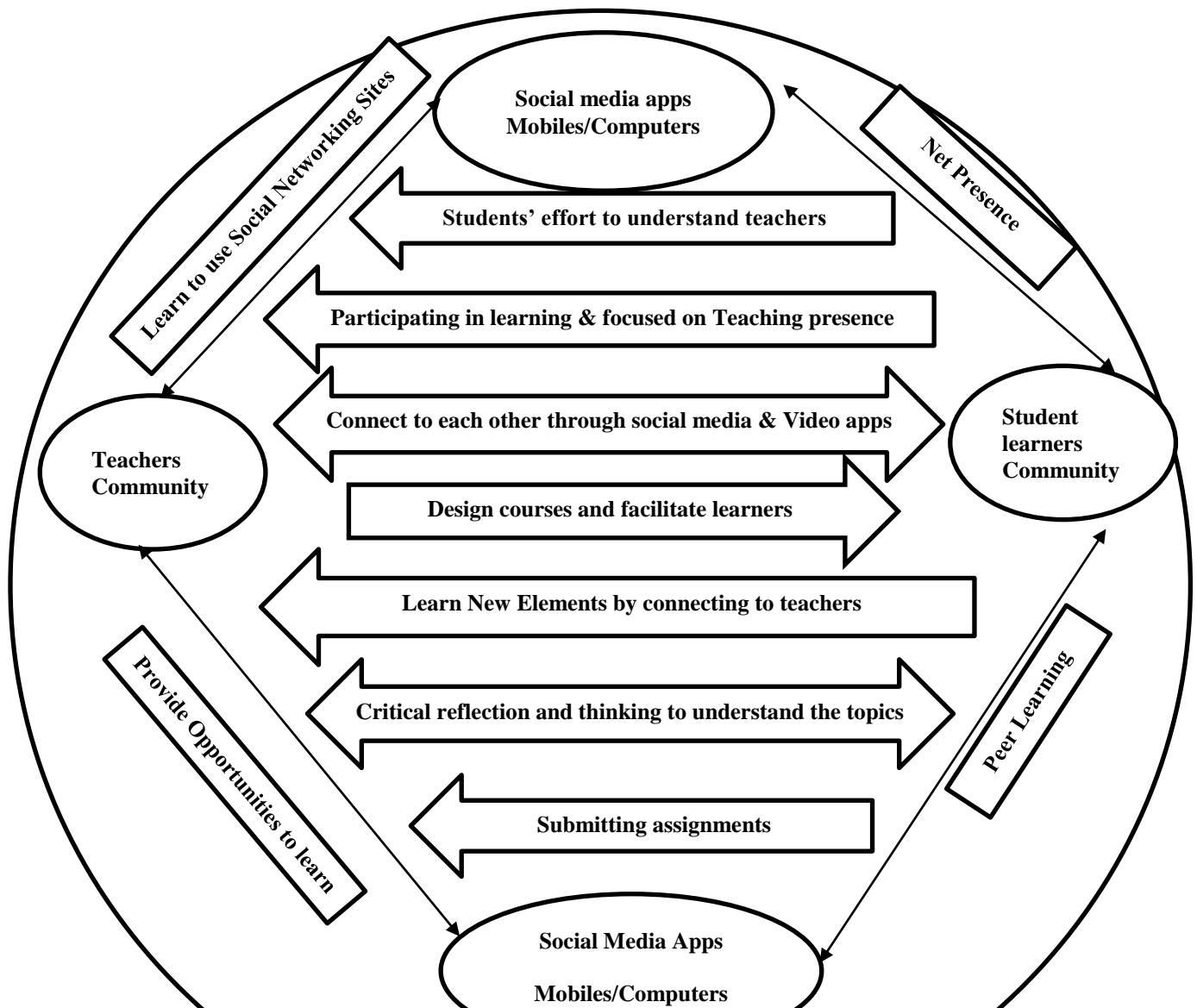
*Appendix – 2*

Table 1. Kruskal-Wallis-H test concerning statements on teaching presence

| Case | Variable | Median | $X^2$ | Asymp.sig |
|---|---|---|---|---|
| 1 | My lecturer allows me to think critically and raise questions on different subjects | 2.0000 | 10.406 | 0.006 |
| 2 | My teacher does not design courses properly | 4.0000 | 8.429 | 0.015 |
| 3 | YouTube teaches me more practical lessons than the lecturer in classroom | 2.0000 | 7.446 | 0.024 |
| 4 | My lecturer conducts tests using WhatsApp | 2.0000 | 19.552 | 0.000 |

*Appendix – 3*

Table 2. Kruskal-Wallis-H test concerning statements on social presence

| Case | Variable | Median | $X^2$ | Asymp.Sig |
|---|---|---|---|---|
| 1 | I am very technical when it comes to using Facebook, WhatsApp and Instagram | 2.0000 | 10.155 | 0.017 |
| 2 | I expect social support from Facebook or Instagram from friends and friends of friends | 3.0000 | 12.684 | 0.005 |
| 3 | I use social media such as Facebook, Instagram, Twitter and WhatsApp to communicate with friends | 2.0000 | 20.698 | 0.000 |
| 4 | I use social media such as Facebook, WhatsApp, Instagram and Twitter to promote myself | 3.0000 | 10.676 | 0.014 |
| 5 | Facebook gives me identity | 3.0000 | 27.999 | 0.000 |
| 6 | Facebook gives me emotional satisfaction when friends encourage me by their posts | 3.0000 | 11.531 | 0.009 |
| 7 | I am on LinkedIn so that I could get a job in future | 3.0000 | 11.678 | 0.009 |
| 8 | I use Instagram mostly to share pictures or video messages with friends | 3.0000 | 9.353 | 0.025 |

*Appendix - 4*

Table 3. Kruskal-Wallis-H test concerning statements on cognitive and learning presences

| Case | Variable | Median | $X^2$ | Mean | SD | A.sig |
|---|---|---|---|---|---|---|
| 1 | I learn from my classmates through WhatsApp interactions | 2.0000 | 11.133 | 2.1443 | 0.81568 | 0.025 |
| 2 | I learn from social media posts that I read | 2.0000 | 22.624 | 2.1612 | 0.85999 | 0.000 |
| 3 | I learn additional information about formal subjects using YouTube videos | 2.0000 | 10.388 | 1.9337 | 0.80495 | 0.034 |
| 4 | I apply knowledge obtained from social media in real-life situations | 2.0000 | 10.498 | 2.3511 | 0.92506 | 0.033 |
| 5 | I feel that social media is democratic. It allows me to express myself in different ways | 2.0000 | 16.186 | 2.3004 | 0.90543 | 0.003 |
| 6 | I use social media apps to relax and learn new information | 2.0000 | 22.826 | 1.9090 | 0.79026 | 0.000 |
| 7 | I don't learn anything by using social media | 4.0000 | 17.519 | 3.4460 | 1.08734 | 0.002 |