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The Techno-Pedagogical Experience: Probing Communicative Affordance of Mobile Phones in Pakistan`s Academia

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Abstract: *The advent of technological advancement has affected every lifestyle and reshaped the concepts related to academic practices. As compared to conventional pedagogy, the new ways of easier communication through digital media devices especially Mobile Phones have offered diverse ways of learning for the students and provided the academicians with a multipurpose platform of sharing ideas, preparing lectures, conducting research and coordinating with the students. The study investigates how digital intervention in pedagogy has affected the learning environment in Pakistan`s academia with a student's perspective. For the purpose, drawing upon the theoretical perspective of Communicative Affordance, a sample of 600 students is surveyed.*

Key Words: Techno-Pedagogical, Communicative Affordance, Academia

Introduction

The use of smart phones in academia has been shown to have a good impact (Johnson & Radhakrishnan, 2017; Karim, 2012). Numerous arguments support the use of cell phones for learning, with language learning being the most significant (Boase, 2008; Hutchby and Barnett, 2005; Katz and Aakhus, 2002). Rajasingham (2010) argues that it is crucial to train the personnel to adapt to evolving methods of instructional design. Learning can be done in a variety of ways, including (a) by speech, (b) through short text messages, (c) through visual displays, (d) through data information, (e) through Internet searches, and (f) using cameras and video clips.

Taking another side, the worldwide adoption of mobile devices smartphones and tablets has been accelerating research on communicative affordances of media and users too. Mobile devices have "changed communicative practices or habits," (Boase, 2008; Helles, 2013; Hutchby and Barnett, 2005; Schrock, 2015). Despite the fact that the mobile phone is sometimes referred to be a tool for "continuous contact" (Katz and Aakhus, 2002), the

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affordance of availability on this account primarily modifies the degrees and ways of usage. On discussing the mobility or portability of mobile devices for users, Helles (2013), makes the insightful observation that "the essential affordance of mobile phones is not the mobility of the device, but the fact that the user becomes a mobile terminal for mediated communicative contact".

The opening of new venues of communication is broadening the scope of production, consumption and effects of media messages as well as introducing new dimensions of investigation for research. As in addition in the field, the relatively new discoveries of diverse theoretical perspectives are the result of adopting an interdisciplinary approach (Humphreys, 2015). In higher education, as a trend, E-learning through digital media is altering how people learn and how instruction is provided (Foty & Mendez, 2014; Mpoza & Maqsood, 2021).

An affordances approach examines technology utilized in real-world contexts by negotiating between the poles of technological determinism (Peter, 2011) and social constructivism (MacKenzie, 1985). Because people have agency over how they utilise technology, a single technology can lead to a variety of possible actions As described by Norman, affordances are "the perceived and actual features of the item, particularly those fundamental properties that control just how the thing may be utilized" (Oudshoorn & Pinch, 2003).

In mobile-mediated communication, affordance is "the mutuality of actor intentions and technical capabilities that create the opportunity for a given action" (Majchrzak, Faraj, Kane, & Azad, 2013). It comes about because of the interaction between a person's subjective evaluation of a technology's utility and its objective characteristics (Gibson, 1986). Since what people do and think while using their phones affects their connections with others, it may also be a performative way to show one's personality. Many studies demonstrate that people are not simply conscious of the communication they make. People are conscious of both the communication they give and the communication they give off when using mobile devices, according to studies with users of mobile social networks (Karim, 2012).

According to Humphreys (2015), the initial mobile social networks were largely focused on mobile phones and employed short-message service (SMS) to communicate with users. The initial mobile social networks included websites, but the network itself was largely composed of mobile messages sent through the service

Mobile social networks are not just a phenomenon of smartphones; they can be accessible by a mobile application (app), a mobile web browser, or SMS. By optimizing mobile social networks for small screens (like 2 x 3 inches) and incorporating location-aware services, mobile web browsers and apps have made it simpler for users to access and use mobile social networks (Davis & Chouinard, 2016).

The degree of affordance being provided to customers has been significantly influenced by the relationship between mobile applications and various features supplied by mobile businesses periodically with the upgrading of their operating systems. Updated versions of WhatsApp, Google Inc.'s social networking program, have been released. As stated in a statement made by Google officials "People's use of mobile devices was significantly different from what it is today when we launched WhatsApp in 2009," Only a few months had passed since the launch of the Apple App Store. BlackBerry or Nokia operating systems were utilized by about 70% of cellphones sold at the time. "Today, 99.5 percent of sales for mobile operating systems—provided by Google, Apple, and Microsoft—were found on mobile devices (The News, December 18, 2018).

By examining the affordance and its role in it, Hammond and Michael (2010) looked into the use of ICT for teaching. They looked at the original affordance notion proposed by Gibson as well as the challenges that came with using it. Khan, Malik, and Amin (2014) assert that advancements in technology have enhanced both the standard of instruction and the academic performance of learners. M-learning is employed as a successful educational tool in other affluent nations, such as

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the UK and US (Vyas & Nirban, 2014). Rajasingham (2010) looked for options to help colleges carry out essential responsibilities including "knowledge storage, processing, and dissemination that may be applied to real-world challenges."

According to Hammond and Michael (2010), affordance offers a distinct viewpoint on the use of ICT in education since it places a strong emphasis on practicable possibilities. In communication, a "affordances framework" explains how affordances "limit what can be done with, around, or through the artifact" (Hutchby, 2001). One of the devices that individuals use to communicate with one another, according to Karim (2012), is a cell phone.

Objective

The study aims,

1. To study the patterns, preferred technologies and practices of mobile applications usage adopted by students in Pakistani Universities

Research Questions

1. How do users take advantage of actions that the availability of Smartphone (Android and iOS) makes possible for academic purposes?

a) What academic advantages and disadvantages Smartphone handling offers to users in workplaces and domestic settings?

b) How do smartphone users take advantage from the Multiplexity of various features offered simultaneously (i.e. texting, voice notes, video messages and image, file sharing) through WhatsApp or other applications?

Hypotheses

H_0: There is no relationship between effective learning and using multiple communicative features (texting, voice notes, video messages and image, file sharing) of Smartphones, teacher and student direct contact, and increased frequency of interaction

H_1: There is a strong relationship between effective learning and using multiple communicative features (texting, voice notes, video messages and image, file sharing) of Smartphones, teacher and student direct contact and increased frequency of interaction

Literature Review

Media allows us to communicate across the location in significant ways, but it also allows us to peek into places we are physically or socially unable to access (Meyrowitz, 1985). As per the needs, mobile phones are advanced with a lot of new features, such as the ability to send emails, play games, internet accessibility, explore social networking sites, browsing music, radio, read books, and much more. (Vaidya et. al. 2016).

University students should utilize their smartphones wisely and refrain from wasting time on pointless text messages, according to Khan, Malik, and Amin (2014). GUMA et. al. (2017), recommended that Smartphone's and mobile devices should be allowed to be used by students, and lecturer to start virtual classrooms, discussion forums and using pre-recorded lecturers with PowerPoint.

Students use a dictionary and other informative functions (Khan, Malik & Amin, 2014). Students and teachers develop, publish, download, and distribute academic resources using their smartphones, while others record and keep files in their phones as part of the teaching and learning process (Msungu et al. 2012). A number of mobile phone learning methods are used in education, including learning by voice, SMS text, graphic displays, information extraction, Internet search, camera, and video clips (Karim, 2012).

The increasing mobility of society has a significant impact on how we live, study, work, play, sell, and purchase; educators and academics have a responsibility to project in accordance with the shifting demands of their audience (Rajasingham 2010). Through calling and messaging, smartphones allowed people to communicate with one another (Vaidya et. al. 2016). With this significant shift, the advancement and ongoing progression of modern mobile devices,

a much more comprehensive integration of these modern devices into educational environments has emerged (Sarrab et al., 2012). According to Vyas & Nirban (2014), the usage of multiple modern technologies in teaching and learning, like m-learning and e-learning, is a result of the rapidly expanding information and communication technologies as well as students' increasing computer literacy.

The influence of cell phones and their consequences on human health are currently being examined and studied, according to Miakotko (2017). People who use their phones excessively develop a dependence on them (Vaidya et. al. 2016). The media facilitates communication in ways that would be challenging to accomplish physically (Meyrowitz, 1985).

Khan, Malik, and Amin (2014) found that students take great pride in their high-end smartphones and occasionally utilize them as a source of unfair tactics during exams. According to Karim (2012), using modern technology and smart devices helps teachers develop and improve the skills of their students.

Instead of using a laptop or desktop computer, the majority of Twitter and Facebook users access the services using other devices like tablets and smartphones (Humphreys, 2015). The use of cell phones helps people who feel lonely. Users tend to be between the ages of 15 and 25. 2016; Vaidya et al. Mobile devices support better learning capacities and comprehension of difficult subjects. This cutting-edge technology also aid in enhancing students' critical thinking and other skills. (Karim, 2012).

The use of mobile phones has decreased face-to-face interaction (Vaidya et. al. 2016). Students are adopting mobile devices to improve learning outside of the classroom, according to Foty and Mendez (2014). The lines between a mobile phone and a computer are blending more and more as personal computing technologies grow more portable (Humphreys, 2015). M-learning devices are ideally positioned to support this process by sending out brief messages about scheduling, assignment due dates, and changes to class timings (Rajasingham, 2010).

The smartphone, in accordance with Miakotko (2017), combines a number of high-end features. Additionally, smartphones have developed into crucial elements of modern communications technology. The accessibility of additional features such as the internet, music, radio, and other things may be a factor in the rise in excessive mobile phone use (Vaidya et. al 2016). Msungu et al. (2012) investigated the use of mobile phones for teaching and learning in Tanzanian higher education institutions. Mobile devices have also been used as teaching and learning tools. The Sokoine University of Agriculture study specifically looked at how mobile phones aided the teaching and learning process, identified the mobile phone applications used for teaching and learning, identified the types of learning activities facilitated through mobile phones, and evaluated each of these aspects.

The multiplexity, direct touch, and higher frequency of mobile media's communicative affordance of availability can be combined. Mobile phones with GPS and Locatability enabled the creation of new "location-based services (LBSs)" including locative and mobile social networks (LMSNs) (Wilson, 2012). According to Rheingold (2002), "one type of context awareness in which machines surpass humans is knowing specific physical location**". (**Lenhart et al., 2010) made use of the environment to enable "site-specific storytelling," which is the creation of stories by little groups to encourage introspection.

Initial plans for mobile devices called for "perpetual contact" (Katz & Aakhus, 2002) between users and their social networks can be termed as Multiplexity. An early study on Keitai in Japan found that people judge mobile phones based on how well their cameras perform (Ito et al., 2005). Multimedia methods gradually changed as better cameras were available. The rising use of digital cameras—including cameras built into other communication devices—favors communication functions, claims Van Dijck (2008). Using a

smartphone to take images and videos has become commonplace (Lenhart et al., 2010).

Giving another stance, scholars also criticize the use of cell phones in academia, Karim, (2012) says that there are drawbacks to using text messaging on mobile devices as a learning tool. For example, dealing with issues in education brought on by forgetting to bring mobile phones, losing track of learners' learning preferences, needs, abilities, and interests, and taking longer to send and receive messages because of network outages. Other examples include sending or receiving test answers and causing annoyance to others.

Theoretical Framework

Technology constructionism asserts that technical artifacts are entirely socially built, both in terms of their form and meaning, while the idea of "affordances" highlight that specific kinds of technology are directly responsible for the formation of new social interactions. As a result, technologies are artifacts that, in the words of Gibson (1979), "may be both molded by and shaping of the practices humans utilize in interaction with, around, and through them." It can be viewed as "functional and relational features that outline, without deciding, the options for agentic behavior in regard to an object" (Hutchby 2001).

A broad framework for analyzing the consequences of subsequent communication and the incorporation of technology, such as mobile media, on daily activities reflects an affordance approach (Shrock, 2015). Social affordances are the social structures that develop along with a certain technical structure (Postigo, 2016). It also revolves around the idea that technological advancements afford for social interactions and organization in order to explore how technology supports social practice (Wellman, 2001).

This technological turn where facilitates the whole process of learning by using social dimensions involving learners' engagement via mobile learning technology (Xiangming & Song, 2018) also points out towards the challenges like lack of experience and selection of appropriate apps (Shraim & Crompton, 2015). The present study investigates the communicative affordance of University students and their Mobile Phones focusing the academic uses. It also probes how various features offered by digital Mobile Phones help students in the accumulation of effective learning and enhance their interaction with instructors.

Research Design

For carrying out this research, the survey method was used. A survey is a comprehensive investigation of a geographic region to acquire information on attitudes, opinions, level of satisfaction, etc. by polling a subset of the population. After the researcher is done with the pilot study the instrument is validated. For this study, a sample of 20 respondents was surveyed for the pilot study that come up with a very fine idea of the audience mindset and the clarity of the instrument. For this study, one questionnaire based on a five-point Likert scale is used for survey. The population of the study was comprised of students who use smartphone for academic purposes in Lahore. A sample of 600 respondents is selected through purposive sampling. The criterion of selecting the respondents involves their usage of smartphone for academic purposes.

Results

The current study is looking at the following hypothesis in light of responses given by students who use smartphones for academic purposes.

H_0: There is no relationship between effective learning and using multiple communicative features (texting, voice notes, video messages and image, file sharing) of Smartphones, teacher and student direct contact and increased frequency of interaction.

H_1: There is a strong relationship between effective learning and using multiple communicative features (texting, voice notes, video messages and image, file sharing) of Smartphones, teacher and student

direct contact and increased frequency of interaction.

Spearman's rho Correlation test was used in SPSS Statistical Software.

Table 1. Correlations

			Effective Learning	Using Multiple Communicative Features
Spearman's rho	Effective Learning	Correlation Coefficient	1.000	.462**
		Sig. (2-tailed)	.	.000
		N	600	600
	Multiplexity	Correlation Coefficient	.462**	1.000
		Sig. (2-tailed)	.000	.
		N	600	600

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

Table 2. Correlations

			Effective Learning	Direct Contact
Spearman's rho	Effective Learning	Correlation Coefficient	1.000	.419**
		Sig. (2-tailed)	.	.000
		N	600	600
	Direct Contact	Correlation Coefficient	.419**	1.000
		Sig. (2-tailed)	.000	.
		N	600	600

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

Table 3. Correlations

			Effective Learning	Increased Frequency
Spearman's rho	Effective Learning	Correlation Coefficient	1.000	.455**
		Sig. (2-tailed)	.	.000
		N	600	600
	Increased Frequency	Correlation Coefficient	.455**	1.000
		Sig. (2-tailed)	.000	.
		N	600	600

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

The Spearman's rho Correlation coefficient test was applied on data to investigate the presence of correlation amongst the taken variables. The relation of effective learning was studied with three variables i.e. multiplexity, teacher and student direct contact, and increased frequency. It was found that in the case of effective learning and multiplexity, the P value was 0.000 that is highly significant. Then the relation among effective learning and teacher and student direct contact also provided the P value of 0.000 which indicates high significance. Whereas the Spearman's rho Correlation between effective learning and increased frequency was found highly significant having a value of P is 0.000. So the taken hypothesis is approved by rejecting the null hypothesis. Consequently, it is proven that there is a positive correlation amongst sound learning environment, multiplexity and interaction between student and teacher, and its increased frequency. This shows a systematic outlook of the variables in a way that the multiplexity, student-teacher contact and increased chances of interaction play a role in effective learning through smartphones. As the students and teachers are able to use multiple

features of smartphone, they can contact the teacher frequently, and this has significantly changed the pedagogy patterns in Pakistani society.

Discussion and Analysis

A total of 600 participants were selected through purposive sampling, out of which 40.2% were male and 59.8% were female. 86.8 % were students while 13.2% were teachers. Considering age, 56.7 % were between the ages 21-25, while 20 % were between the ages of 26-30, respondents of age bracket 16-20 were 16.2 %. The results from the show that majority of the respondents were of the age between 16-30 years. Since Vaidya et. al (2016) also stated the majority of the smart phone users are in the age group of 15 to 25 years. This age bracket is also resonating with the age group in Pakistani community that gets be fitted by smartphones, especially for academic use.

The respondents belonged to various socio-economic statuses, It was observed that 15.7 % of respondents were having monthly income of PKR 100000 or above, other significant fractions were 13.2% respondents who had income ranging from 20000-30000. 12.5% had income ranging between 40000 to 50000 per month. 12.2% of respondents were having income between 50000-60000.therefore a major part of our respondents was comprised of middle class people.

On discussing the education level of the respondents, 213 respondents out of 600 were graduates (35.5%), while 219 respondents (36.5%) had a Master's Degree, there were 111 respondents (18.5%) with M. Phil, and 2% respondents (12) were having a qualification of PhD or above.

On asking the respondents whether the document editing facility in smartphones has enabled me to have a better learning experience, 288 out of 600 respondents (48.0%) responded as agree, additionally, 125 respondents (20.8%) also responded as strongly agree whereas only 15 respondents (2.5%) strongly disagreed to the statement. On the question whether the respondents whether they use a smartphone for preparing presentations on their lectures, 228 respondents out of 600 (38.0%) responded as agreed while 116 respondents (19.3%) also responded as strongly agree whereas only 28 of them (4.7%) showed their response as strongly disagree.

On inquiring about the respondents whether Smartphones help in recording audio and video of academic concepts, 299 respondents out of 600 (49.2%) responded as agree, 209 out of them (34.8%) also responded as strongly agree. Whereas only 11 respondents (1.8%) showed their response as strongly disagree.

The respondents were asked if they think lectures delivered through voice notes are easier to access than traditional (paper) notes, , 197 respondents (32.8%) responded as agree, while 100 respondents (16.7%) also responded as strongly agree, whereas only 25 respondents (4.2%) showed their response as strongly disagree. Strikingly 158 respondents (26.3 %) stayed neutral in their opinion, and 120 respondents (20.0%) also disagreed to the statement.

On responding to whether smartphones enable open discussion platform (interaction between teachers & students) for a better learning experience, 300 out of them (50.0%) responded as agree, while 120 respondents (20.0%)responded as strongly agree. Whereas only 11 respondents (1.8%) showed their response as strongly disagree.On asking the respondents whether they think that a smartphone facilitates academic consultation from multiple places due to its portability, 350 (58.3%) responded as agree, 146 (24.3%) responded as strongly agree, whereas only 5 respondents (0.8%) showed their response as strongly disagree.

On the question that easy handling of the smartphone has facilitated the replacement of heavy bags and files or not, 287 out of 600 respondents (47.8%) responded as agree, 194 respondents (32.3%) also responded as strongly agree, while only 12 respondents (2.0%) showed their response as strongly disagree.

On asking 600 respondents whether smartphones provide all day connectivity for the education process, 319 (53.2%) responded as agree while 158 (26.3%) said they strongly agree to the statement. Whereas only 14 respondents (2.3%) showed their response as strongly disagree. On

asking the respondents whether smartphones have enabled students to get distant learning 331 out of 600 respondents (55.2%) responded as agree, whereas only 7 respondents (1.2%) showed their response as strongly disagree.

On asking the respondents whether immediate response through smartphone facilitates a learning atmosphere between teachers and students, 329 respondents (54.8%) agreed whereas only 7 out of 600 respondents (1.2%) showed their responses as strongly disagree.

Responding to their use of multiple platforms (WhatsApp and Facebook) for academic purpose through their smartphones, as many as 303 (50.5%) responded as agree, 165 (27.5%) also responded as strongly agree, whereas only 11 respondents (1.8%) showed their response as strongly disagree. On asking the respondents whether students are free to choose variety of formats (audio video, text) for information sharing, 357 respondents (59.5%) responded in agreement, 187 out of 600 (31.2%) also responded as strongly agree, only 5 respondents (0.8%) showed their response as strongly disagree.

On asking the respondents whether easy access to contact a teacher provides a better opportunity of learning for students, 345 (57.5%) responded as agree, as many as 163 respondents (27.2%) also responded as strongly agree, only 6 respondents (1.0%) strongly disagreed to the statement.

On Locatability,600 respondents were asked if easy access to contact from any place using a smartphone creates a sound learning atmosphere, as many as 362 respondents (60.3%) responded as agree while only 5 respondents (0.8%) showed their response as strongly disagree.

When the respondents were asked whether smartphones have provided frequent chances of connectivity for educational purpose, an evident 63.8%, (383 respondents) agreed to the statement. Only a count of 8 (1.3%) showed their response as strongly disagree. 134 respondents (22.3%) also responded as strongly agree. Khan, Malik & Amin, (2014) wrote that students use a dictionary and other informative functions in smartphones. With a cell phone, parents of female students find it simple to contact their daughters. They believe that this new technology has increased the quality of instruction as well as student academic performance.

Conclusion

Conventional pedagogy has been an important area of research for scholars and the advent of new technology, modern devices has opened up new venues for discussion. At one glance, the merged look of technological development with pedagogy trends seems to be a property of developed countries. A p-value of 0.000, 0.000, and 0.000 respectively proves the hypothesis, which was intended to explore the relationship between effective learning and utilizing many communicative aspects of smartphones and direct engagement between teachers and students.

Recommendations

1. The study has found a very strong relationship between establishing a sound learning atmosphere, with the WhatsApp-enabled smartphone, it is suggested that a working strong internet at different institutes.
2. Teachers still working on traditional ways of learning can also get an advantage from technological development and enhance their teaching skills and learning capacities of their students.
3. Mobile technology in a third-world country has mostly been prone to criticism, however, this study has highlighted the positive aspect of technology through educational use, different seminars and workshops can be conducted on various levels of academia, especially in remote areas, to give the teachers and students awareness about the use of technology to achieve their academic goals in a better way.

Limitations

1. The focus of this study was five main Public sector institutes of Lahore city offering courses at the graduate and post-graduate level, since smartphone phone culture can

also be found at elite private schools, at O-Levels, A-Levels, and at the Matriculation level, such audience can also be included in further studies to have better understanding of smartphone usage in the whole academia of Pakistan.

2. Because the study was framed within the theoretical framework of communicative affordance, all of the questions were created to assess the relationship between smartphone technology usage and user characteristics. A common criticism of the questionnaires was that they were solely concerned with highlighting the advantages of technology, even though this was the study's intended goal. Despite the fact that there was also an extreme option of disagreement, researchers may choose to utilize scales other than the five-point Likert scale in future studies in order to measure the audience's opinion in a different way.

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