© *Media Watch* 8 (1) 75-88, 2017
ISSN 0976-0911 e-ISSN 2249-8818
DOI: 10.15655/mw/2017/v8i1/41273

New Media Technologies in Teaching and Learning in Higher Education

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New media technologies have immense opportunities as well as challenges in enriching teaching-learning processes which involve the teachers and the taught. Undoubtedly, the effective use of new media technologies would depend on the teaching faculty as they are the ones who have to become adept in innovative use of new media technologies so as to make students use and enrich their learning process for a better understanding of their subjects of study. A few Indian scholars have examined the use of a few new media technologies and their role in the higher education sector. Such studies need to be conducted in different parts of India so as to gain a appropriate understanding of the perceptions and use patterns of new media technologies among higher education teaching fraternity. In this context, the present study explored the use of new media technologies by rural and urban college teachers of diverse disciplines, professional seniority, and socio-economic backgrounds. The analysis of the data collected from a purposive sample of 223 faculty members drawn from urban and rural colleges of Karnataka contributes to our understanding of the extent of and barriers to adaption of new media technologies in higher education sector.

Keywords: Teaching-learning, new media, flipped-classroom, mobile app, higher education

Computers, mobile phones, and internet have found their way into our classrooms. These are the new media technologies (NMTs), which are computer-based and, more specially today, with the advent of smart phones, and 3G and 4G internet, they are resident in our pockets, accessible at the will of the user. They have seeped into every walk of life, including education, at every level. In the field of education, they are seen to have immense opportunities in as well as pose challenges to enriching teaching-learning processes which involve the teachers and the taught.

Some of the NMTs which have come to be adapted in the multi-layered educational system across the world in varying degrees include massive open online courses, flipped classroom concept, e-libraries, mobile apps, and scores of social media platforms such as Facebook, Twitter, YouTube, and blogs, just to name a few. In India, several leading educational institutions such as the IITs, Hyderabad-based JNTU, business management schools, and a few universities have been using new media technologies in varying measures. According to official figures, India is home to more than 1.21 billion people, with 833 million rural masses, (census of India, 2011). Currently, the population of India stands at about 1.33 billion (Worldometers, 2016). With a huge youth population under about 600 million (or 48% in 2011), India boasts of a large pool of productive human capital for the future. And to harness the full potential of this human capital, the government of India has

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launched a drive for the democratisation of education at all levels of schools. In 2004, the Government of India (GoI) launched information and communication technology programmes in schools to aid school education. In another gesture of commitment to ICT-enabled education, the Indian Space Research Organisation launched India's first education satellite exclusively for education, in the same year (Das, 2011).

More recently, India launched its own indigenous version of massive open online courses- 'Swayam' (Shah, 2016), pointing to the importance ICTs and new media technologies are assuming in the changed modes of learning and knowledge production within the educational ecosystem of the country.

Literature Review

New media technologies are newer forms of ICTs which dominated much of the last two decades of the 20th century. Accordingly, much of the research in the 20th century has focused on the use of ICTs in education. In the current changed scenario of the wired classrooms, media scholars have focused on wired and wireless technologies. ICTs is a general umbrella term under which a number of technologies, including the digital, could be clubbed. While ICTs were primarily computer based, and to a certain extent mass media-based, they were not wired in the third quarter of the 20th century India. Stephen McDowell (2009) includes the internet under ICTs, while arguing that ICTs such as satellite television (for example, Satellite Instructional Television Experiment (SITE) carried out in 1975-76 in India) or the World Wide Web were initially conceived as educational technologies. But we need to note that digital technologies did not exist in India during the time of the SITE; and McDowel specially refers to non-wired, satellite television technology. Information communication technologies -then- were analogue. Hence, all ICTs were not digital. The *new*-ness in the NMTs comes post-television era, in the digitised -wired or mobile- platforms. This makes the new media technologies, referred to in this article, are digital and internet based. Because of the inherent advantages of the internet platforms, the use of NMTs makes classrooms makes a privileged site worthy of examination. Though tech-savvy classrooms, as we know them today, are a modern day construction. Bachmann and Shah argue that classrooms were "historically constructed with and in relationship to technologies of knowledge production." (2016: 273)

The relevance and importance of NMTs in education comes from the very nature of these technologies. By their very nature, accessibility, and the ease with which today's children and youth are engaged with NMTs, they provide a technological and digital context for educators or the "more knowledgeable others" (Vygotsky, 1986). Trucano is of the opinion that though ICTs are believed to be empowering teachers and learners, promoting change, and fostering development, he believes that there is a lack of compelling data to support such a belief. Neither are the outcomes of the use of ICTs in education clear, and hence open to debate (2005).

Initially, in the NMT era, there was a perception that classrooms would become obsolete because of the interactive nature and easy accessibility of higher education aided by digital technologies, compared to the traditional, lecture-based, one-way education. In continuance of this belief, the Ministry of Human Resource Development (MHRD) in the Government of India has been working for over a decade and spending billions of dollars on making higher education accessible to any willing learner, on the click of a button. Starting with the Saskhath project in 2006 to digitise and democratise higher education, and networking with hundreds of universities and thousands of colleges

and polytechnic institutions across the country, the MHRD set up large infrastructures for the production, distribution, and access of digitised text audio-visual, and animated educational content (http://www.sakshat.ac.in/). While, massively online open courseware (MOOCs) attained rapid popularity for open access education across the world in the first decade of the current century, their use and popularity also declined even faster due to their pitfalls (Bachmann and Shah, 2016). On the other hand, studies have shown the impact of using creative and engaging techniques in teaching, especially language teaching (Abel, Nerren, & Wilson, 2015). Undoubtedly, the effective use of NMTs would depend on the teaching faculty as they are the agents who need to become adept at innovative use of such technologies to help students use them and enrich their learning process for a better understanding of their subjects of study.

Some scholars have considered other factors which have a bearing on a child's development. For example, referring to Vygotsky's zone of proximal development (ZPD), Veer (2007: 95) suggests that in their social interactions with teachers and peers, "children learn to master specific cultural tools that enable them to solve intellectual problems and master their own behaviour." A child's all-round development is aided by human, social, cultural, and technical/ digital tools (Berk & Winsler, 1995). In such a collaborative enterprise, the 'more knowledgeable others' like teachers, informationally empowered and educationally supportive peers, and information-rich technologies serve as 'scaffolding' for a child, helping him/ her traverse the 'zone of proximal development' as referred to by Vygotsky (McLeod, 2007; Balaban, 1995; Berk and Winsler, 1995).

A few Indian scholars have examined the use of some of these NMTs and their role in harnessing the potential of children and students in higher education (Das, 2011; Jose, 2016) to cross the ZPD and realising their full potential. But because of the diverse geography, culture, varieties of languages, socio-economic and ethnic differences within the one country, these studies tend to be local in nature. Such studies need to be conducted in different parts of India so as to gain a fuller understanding of the perceptions and use patterns of NMTs among higher education teaching fraternity.

In this context, the present study has explored the use of NMTs by rural and urban college teachers of diverse disciplines, professional seniority, and socio-economic backgrounds. It worked out a research design to collect data from the faculty teaching in colleges and universities, to contribute to our understanding of the extent of, the reasons for, the barriers to the adaption of NMTs in higher education sector, and their perceived benefits.

Methodology

This study employs a quantitative methodology, using the survey questionnaire. A total of 260 respondents teaching in 34 colleges and four universities in Karnataka were contacted using a purposive sample, and survey questionnaires were served. Of the 34 colleges, 12 are state-owned, whereas 22 privately managed. Among the four universities shortlisted, one is private and three others are state-owned or managed.

The sample was taken from Karnataka, a state in southern India. Fourteen of the 30 districts of Karnataka, which are clubbed into four administrative divisions, were included in the sample. The fourteen selected districts were: Raichur and Kalaburgi from Kalaburgi division; Bengaluru Urban, Bengaluru Rural, Ramanagara, Davanagere, and Chikkaballapura from Bengaluru division; Vijayapura, Uttara Kannada, and Dharwad from Belagavi division; and the districts of Mysuru, Hassana, Mangaluru, and Mandya from Mysuru division.

Besides representing the geo-linguistic diversity within the state, these districts also represent the socio-economic, educational, and technological diversities in terms of development. Bengaluru and Mysuru divisions are relatively well-developed in terms of industrial, technological, economic growth, have some of the well-known colleges and universities of the state and the country, and show the best results in school and higher secondary level education examinations at the state level. In contrast, Belagavi, and especially Kalaburgi division, lack such well-known and well-equipped educational institutions. Though Hubli in Dharward district (Belagavi division) is relatively well-developed industrially, and economically better off, other parts of the division are not.

Responses from the 260 respondents were elicited, of which 223 responses were valid, while 37 were not, either because of the incomplete or because of the faulty responses given. Hence they were eliminated, leaving 223 responses for analysis. The study used frequency tables for demographic description, chi-square, *t*-test, and ANOVA were used for inferential testing significance of the findings. The section below lists the results.

The survey questionnaire comprised of 24 questions intended to elicit data concerning the teachers' demographics (13 questions), their use/non-use of new media technologies and their reasons for it (10 questions), their preferred platforms of such technologies, and their 'open comments' (one question). The obtained data was analysed using SPSS. After determining the respondents' profile and the reasons of the non-users (72) for not using NMTs in higher education, the NMT users' (153) data was separately analysed to understand the socio-demographic variables, their use pattern, preferences and reasons for the applications they use in teaching, and their perceptions of the results of that use.

Research Questions

RQ1: Do teachers at higher education level employ NMTs, and to what extent?
RQ2: What is the profile of the teachers who use/don't use NMTs in education?
RQ3: What are the reasons for their using/not using NMTs in education?
RQ4: What are the NMT platforms preferred by teachers for teaching?
RQ5: What are the perceptions of teachers regarding their influence on students on the use of NMTs?

Analysis and Findings

Table 1 shows that of the 223 respondents, 47.1% (105) are male and 52.9% (118) are female. Similarly, 28.7% are Ph.D holders, 12.6% M.Phil holders, and 58.2% have obtained a Masters degree. Almost half the number (111 or 49.8%) of the respondents hail from rural areas of the northern and central parts of Karnataka, whereas 112 (50.2%) respondents are from Bengaluru and Mysuru divisions.

There are more Assistant Professors and Associate Professors (76.2%) among the respondents than Professors (23.8%). While 64.1% of teach under-graduate programmes, only 12.6% teach at masters level, and 23.3% teach at both levels. A big majority of them.

Table 1. Sample description

Variable		(N=223) (%)	Range	M	Sd
Sex:	Male	47.1			
	Female	52.9			
Age (years)			(22-58) 36	34.4305	9.202
Qualification:	PhD	28.7			
	MPhil	12.6			
	Master	58.7			
Location:	Urban	49.8			
	Rural	50.2			
Designation:	Professor	23.8			
	Associate/Asst. Prof	76.2			
Years of Experience:		223	(1-35)34	8.8477	8.340
Teaching Level:	UG	64.1			
	PG	12.6			
	Both UG & PG	23.3			
Aided/Unaided:	Aided	22.9			
	Unaided	77.1			
Subjects of Teaching:					
	Science	32.3			
	Social Sciences	24.2			
	Languages	18.8			
	Commerce/Management	24.7			

(77.1%) are unaided or receive salaries from the private managements, which usually tend to be meagre, and 22.9% of them are aided or are paid by the state government. The sample represents a variety of streams of education: sciences (32.3%), social sciences (24.2%), languages (18.8%), and commerce/management and other technical or professional courses like nursing and law (24.7%).

Among the 223 valid respondents, 151 respondents confirmed that they use new media technologies in higher education, whereas 72 do not use them. The mean age of the entire sample (223) is 34.430 years, with a minimum of 22 years (three respondents) and maximum of 58 years (four respondents), and 8.8475 years mean for the number of teaching experience (Table 1). The analysis reveals a 9.20266 standard deviation (SD) for age, and 8.34094 SD for teaching experience. It is relatively a younger sample, both in age and teaching experience. The Pearson Correlation (2-tailed) was .860, with a significance value of .000, indicating a significant relationship between the age of the faculty and their teaching experience.

Table 2 gives the distribution of the sample, both for users and non-users of new media technology in higher education. It separates and tells us who the users and non-users are. For example, in the cross tabulated frequency distribution shown in Table 2, the incidence of using NMTs in teaching among the faculty members in Karnataka is significantly higher among females (74.6%) than male (60%) respondents. Conversely, the habit of not using NMTs is salient among males (40%) than females (25.4). The Chi- square test shows (see Table 2) a statistically significant association between sex and the use of NMTs in teaching; X^2 (1, N = 223) = 5.4000, p=.020.

Table 2. NMT use in teaching by socio-demographic variables

Variables		NMT Use		Total	Chi-square Results
		Use N (%)	Don't Use N (%)	N (%)	
Sex:	Male	63 (60.0)	42 (40.0)	105 (100) 118	X^2=5.400
	Female	88 (74.6)	30 (25.4)	(100)	df =1
	Total	151 (67.7)	72 (32.3)	223 (100)	Sig =.020
Qualification:	PhD	52 (81.3)	12 (18.8)	64 (100)	X^2 =8.829
	MPhil	20 (71.4)	8 (28.6)	28 (100)	df =2
	Masters	79 (60.3)	52 (39.7)	131(100)	
	Total	151 (67.7)	72 (32.3)	223 (100)	Sig =.012
Designation:	Professor	39 (73.6)	14 (26.4)	53 (100)	X^2 = 1.096
Assoc. / Asst. Prof.		112 (65.9)	58 (34.1)	170 (100)	df =1
	Total	151 (67.7)	72 (32.3)	223 (100)	Sig =.295
Teaching Level:	UG	86 (60.1)	57 (39.9)	143 (100)	X^2 =10.850.
	PG	24 (85.7)	4 (14.3)	28 (100)	df =2
	Both UG & PG	41 (78.8)	11 (21.2)	52 (100)	Sig=004
	Total	151 (67.7)	72 (32.3)	223 (100)	
Aided/Unaided:	Aided	37 (72.5)	14 (27.5)	51 (100)	X^2= .707
	Unaided	114 (66.3)	58 (33.7)	172 (100)	df=2
	Total	151 (67.7)	72 (32.3)	223 (100)	Sig = .400
Subjects:	Science	47 (65.3)	25 (34.7)	72 (100)	X^2 = 3.849
	Social Science	32 (59.3)	22 (40.7)	54 (100)	df =3
	Languages	31 (73.8)	11 (26.2)	42 (100)	Sig = .278
Commerce/Management		41 (74.5)	14 (25.5)	55 (100)	
	Total	151 (67.7)	72 (32.3)	223 (100)	

t-Test

Variables		N	Mean	SD	t	df	Sig (2 tailed)
Age:	Use NMT	151	35.377	9.16715	2.242	221	.026
	Do not use NMT	72	32.444	9.05988			

If age is considered, those who use NMTs have a higher mean age than those who do not use them in teaching. The t-test shows that the use of NMTs in teaching is dependent on age. In other words, the incidence of using NMTs in teaching is significantly higher among the faculty members who are of relatively higher age, t (221) = 2.242, p = 0.026. Likewise, faculty members with doctorates are more likely to use NMTs in teaching (81.3%), than faculty with M.Phil. (71.4%), and Masters degree alone (60.3%). Chi-square test points to a significant relationship between the use of NMTs and the qualification of teachers: X^2 (2, N=223) = 8.829; p=.012.

A third variable that has a significant relationship to the use of NMTs is the teaching course level of the faculty concerned. The teachers engaged in teaching Masters level courses have a higher count in using NMTs in teaching; 24 teachers (85.7%) engaged in teaching only the Masters level courses use NMTs compared to the 86 (60.1%) who teach only the Under Graduate courses and the 41 (78.8%) teachers who are involved in teaching at both the levels. The chi-square test show the relationship to be significant: X^2 (2, N=223) =10.850. *p*=.004.

Other variables such as designation/ grades of the teachers (professor or associate professor or assistant professor) with an X^2= .295 and p =1.096, state-aid (salaried) to the teacher, with a p-value of .707, and the subjects taught by the teacher (whether it is science, social science, languages or commerce and management) with a p-value of p =3.849, do not show any significant relationship with the use of NMTs. While 73.6% of the professors use NMTs, 65.9% of the Associates and Assistant Professors use them in their teaching; 72.5% of the aided teachers receiving state salary and 66.3% of the unaided (receiving private management salaries), and 65.3% of teachers teaching science-related subjects, 59.3% teaching social science related courses, 73.8% language teachers, and 74.5% of the commerce or management and other teachers use NMTs in their teaching. Though there are some differences in the percentage of the users, chi-square test reveals that the differences are not significant.

It is observed that among the total of 72 non-users of NMTs, 42 (40%) are male and 30 (25.4%) are female; 52 (39.7%) are Masters degree holders compared to the 12 (18.8%) Ph.D degrees holders, and 8 (28.6%) M.Phil degrees holders. Among the 72 non-users, 49 (43.8%) hail from rural areas, as against the 20.7% who are urban teachers. While the significance of the relationship between the qualification of the teacher (.000), place/ district (urban or rural) in which the teacher is based (.002), receiving state aid (.000), the grade or designation of the teacher (.000), and the level (UG or Masters) of the academic programme they teach at (.000) is high to not using NMTs, other variables such as sex (.157) and subjects they teach (.065) do not have significance to their non-use of NMTs.

Table 3. Reasons for not using NMTs in teaching

Reasons	N	%
No internet facility in my college/department	31	43.1
Not sure of NMT benefits in teaching	16	22.2
I am not interested	8	11.1
Don't know how to use NMTs in teaching	7	9.7
Other reasons	10	13.9
Total	72	100.0

Among the 223 respondents, 72 teachers do not use NMTs. Using descriptive statistics, it is figured out that 43.1% teachers do not use NMTs because they do not have access to internet, followed by 22.2% who are not convinced of the benefits of using NMTs in higher education, 11.1% those not interested at using them, 9.7% are those who do not know how to use them, and 13.9% have other reasons for not using them (Table 3).

Among NMT Users

Is the longevity of using NMTs in higher education related to any of the variables under consideration? To know the relationship between longevity of using NMTs (dependent variable) and independent two-group variables such as sex, location, designation, and teachers receiving state salary, they are cross tabulated and a *t*-test is performed to see the significance.

Among the 151 users, 63 are male (mean 4.53 years of experience at using NMTs) and 88 female (mean 4.2386), with a mean difference of .30105 years. The relationship of sex of the NM users to longevity is not significant (*p*-value .581) at *t* (149, N=151) = .553. Similarly, longevity of using NMTs does not have significant relationship with the users' salary type or source (state-aided or private management-aided); 37 of the users are 'aided' and 114 are unaided or paid by private managements, with a mean difference of -0.12447, and total (149, N=151) = -0.199, with *p*-value .842.

Two other variables, viz. location and designation of the users, show significant relationship with the longevity of using NMTs. While 88 (mean 4.8182 years) among the 151 NMT users are urban, 63 (mean: 3.7302 years) are rural, with a mean difference of 1.08802 years. The *t*-value is 2.025 (*df*=149). The difference between the urban and rural teachers in the longevity of using NMTs is significant (*p*=.045), with more urban teachers using NMTs.

Similarly, the designation of teachers has a significant relationship with the longevity of using NMTs in teaching: 39 of the NMT-using teachers are professors, whereas 112 are either associate or assistant professors, with a mean of 5.4872 and 3.9732 years of experience respectively, and a mean difference of 1.51397 years. The relationship is significant with a *t*-value of 2.519 (*df*=149) and *p*-value .013, with a significantly more number of professors using NMTs. To ascertain the relationship between longevity of using NMTs with groups of multiple independent variables, One Way ANOVA is used. Length of experience in the teachers' use of NMTs is considered against three other variables: teachers' qualification, level of the courses they are teaching, and the subjects they teach.

Table 4 shows that while the 20 M.Phil. degree holders have the maximum experience in using NMTs (mean: 5.6500 years), 52 Ph.D. holders have 4.9808 years of experience, and 79 Masters degree holders have a mean 3.6329 years of experience in using NMTs. With an *f*-value =4.605 (BG *df=2,* and WG: 148, N=151), and *p*-value .011, the relationship is significant. The higher is the qualification of the teachers, the more they tend to use NMTs.

Similarly, the level of a course a teacher teaches also is related to the use of NMTs. While those (24) teaching at the Masters level have a mean 3.9583 years of experience in using NMTs, those teaching at Under Graduate level (86) have a mean 3.6744 years of experience. The 41 teachers who teach both at UG and Masters level have the maximum of 6.0488 years of experience in using NMTs. With an *f*-value 8.162 (BG2; WG 148, N=151) and *p*-value .000, the relationship is significant. Teachers teaching at Masters level tend to use more NMTs than those teaching at under-graduate level. But the subjects taught by teachers do not have a significant relationship with the years of experience in using NMTs. Science-

related subject teachers (47) show a mean experience of 4.1489 years, social sciences teachers (32) have a mean of 4.0625 years, language teachers (31) have a mean of 4.6452 years, and commerce/ management-related and other subject teachers (41) have a mean of 4.6341 years experience. With an *f*-value of .320 (*df*- BG: 3, WG: 147, N=151) and *p*-value 8.11, the relationship is not significant. Though the mean years of use experience of NMTs in language related courses is relatively more, nature of courses is a not major factor in determining their use.

Table 4. Longevity of NMT use by demographic variable

Variables		Group statistics			*t* -Test results			
		N	Mean (years)	SD	Mean difference	t	df	Sig
Sex:	Male	63	4.5397	3.42583	.30105	.553	149	.581
	Female	88	4.2386	3.20199				
	Total	151	4.3642	3.28934				
Location:	Urban	88	4.8182	3.23609	1.08802	2.025	149	.045
	Rural	63	3.7302	3.28342				
	Total	151	4.3642	3.28934				
Designation:	Prof	39	5.4872	3.56793	1.51397	2.519	149	.013
Assoc./Asst.	Prof	112	3.9732	3.10901				
	Total	151	4.3642	3.28934				
Govt Aid:	Aided	37	4.2703	3.39647	-.12447	-.199	149	.842
	Unaided	114	4.3947	3.26856				
	Total	151	4.3642	3.28934				

One Way ANOVA

Variables	N	Mean (years)	SD	BG* & WG*	*df*	SS	MS	F	Sig
Qualification:									
PhD	52	4.9808	3.43848	B G	2	95.082	47.541	4.605	.011
MPhil	20	5.6500	3.75955	WG	148	1527.885	10.324		
Masters	79	3.6329	2.90083						
Total	151	4.3642	3.28934	Total	150	1622.967			
Teaching level:									
UG	86	3.6744	2.86743	BG	2	1.61222	80.611	8.162	.000
PG	24	3.9583	2.86628	W G	148	1461.744	9.877		
Both UG & PG	41	6.0488	3.78782						
Total	151	4.3642	3.28934	Total	150	1622.967			
Subjects of Teaching:									
Sciences	47	4.1489	3.56297	BG	3	10.525	3.508	.320	8.11
Soc. Sciences	32	4.0625	3.55544	WG	147	1612.441	10.969		
Language/Arts	31	4.6452	2.71475						
Commerce/	41	4.6341	3.22301						
Management									
Total	151	4.3642	3.28934	Total	150	1622.967			

Note: BG* Between Groups; WG* Within Groups

Regularity of NMT Use by Socio- Demographic Variables: The analysis reveals that the practice of using NMTs regularly is not common among the faculty members. As could be noted in Table No 5, only a small minority (17.2%) of the respondents reported using NMTs in teaching regularly, while an overwhelming 44.4 % of the teachers are occasional users and the remaining 38.4 % are frequent users.

Between the two sex groups there are not any statistically significant difference when compared with the regularity of using NMTs (*p*-value=.949): among the regular users of NMTs, men are 17.5%, whereas women are 17.0%. Among the frequent users 39.7% are male and 37.5% are female, and among occasional users 42.9% are male and 45.5% female. Similarly, the regularity of NMT use in teaching is not dependent on the faculty members' qualification, designation, the level of courses they teach, the subjects of teaching and the source of their salaries (aided or unaided). At $X^{2\ (4,\ N=151)}$ =4.956 and *p*-value .292 (for qualification) and p=.495 (designation), subject they teach (.606) the relationship is not significant.

Overall, under the designation variable, 17.2% are regular users, and 44.4% are occasional users, with a *p*-significance value .495. Teachers teaching at UG or PG level also do not show any significant relationship (p-value .852), with only 17.2% users reporting to use NMTs regularly (Table 5).

In the aided-unaided category of teachers, the overall percentage of NMT users is 17.2, while among the state-aided faculty it is slightly higher (21.6%) than the unaided (15.8%). But a bigger percentage of users still are found to be in the occasional user category (44.4%). The p-value .704 suggests that the regularity of using NMTs in higher education is not dependent on source of the salary or the amount. In a like manner, analysis of teachers teaching specific subjects and their regularity of the use of NMTs is not significantly related, with 17.2% of the teachers using NMTs regularly, while a big percentage (44.4) of teachers using only occasionally. The X^2 = 4.522 (*df*=2, N=151) and p-value of .606 show that the regularity of using NMTs is not dependent on the subjects they teach.

NMT Platforms preferences: Table 6 shows that among various platforms/ applications available, YouTube is the most sought after technology by teachers (74.8%), followed by WhatsApp and online newspapers at 49.0% each, and MOOCs at 46.4%. Other NMTs preferred by educators were Facebook (35.1%), blogs (31.8%), online TV (15.2%), Instagram (7.3%), Twitter (6.6%), and other applications (22.5%). This question offered multiple choices, in which respondents could choose all those responses applicable to them, and hence yields percentages beyond 100.

Table 7 shows that the maximum number of users (84.4%) employ new media technologies for updating themselves in their respective fields, followed by 72.2% to interact with their students. About 60.9% of the teachers say that they use NMTs for their own research purpose, such as publication of papers, review of literature, and data collection. While 43.7% teachers use them as an aid in their lectures, 36.4% respondents use NMTs to post/ notify assignment for students, and 25.2% of the respondents use NMTs as a platform to submit student assignments. Table No. 8 shows the analysis of the teachers' perceptions of using NMTs: what are its perceived effects on students.

Table 5. Regularity of NMT use by socio-demographic variable

Variables	Regularity of NMT Use			Total	Chi-Square
	Regularly N (%)	Frequently N (%)	Occasionally N (%)	N (%)	Results
Sex: Male	11 (17.5)	25 (39.7)	27 (42.9)	63 (100)	X^2= .105
Female	15 (17.0)	33 (37.5)	40 (45.5)	88 (100)	df =2
Total	26 (17.2)	58 (38.4)	67 (44.4)	151 (100)	Sig =.949
Qualification:					
PhD	6 (11.5)	26 (50.0)	20 (38.5)	52 (100)	X^2 =4.956
MPhil	4 (20.0)	6 (30.0)	10 (50.0)	20 (100)	df =4
Masters	18 (23.0)	28 (32.9)	37 (46.9)	79(100)	Sig =.292
Total	26 (17.2)	151 (67.7)	72 (32.3)	151 (100)	
Designation:					
Professor	9 (23.1)	13 (33.3)	17(43.6)	39 (100)	X^2 = 1.408
Asso/ Asst. Prof.	17 (15.2)	45 (40.2)	50(44.6)	112 (100)	df =2
Total	26 (17.2)	58 (38.4)	67 (44.4)	151 (100)	Sig =.495
Teaching Level:					
UG	14 (16.3)	32 (37.2)	40 (46.5)	86 (100)	X^2 =1.355
PG	3 (12.5)	10 (41.7)	11 (45.8)	24 (100)	df =4
Both UG & PG	9 (22.0)	16 (39.0)	16 (39.0)	41 (100)	Sig=.852
Total	26 (17.2)	58 (38.4)	67(44.4)	151 (100)	
Aided/Unaided:					
Aided	8 (21.6)	13 (35.1)	16 (43.2)	37 (100)	X^2= .703
Unaided	18 (15.8)	45 (39.5)	51(44.7)	114 (100)	df=2
Total	26 (17.2)	58 (38.4)	67(44.4)	151 (100)	Sig = .704
Subjects:					
Science	6 (12.8)	20 (42.6)	21 (44.7)	47 (100)	X^2 = 4.522
Social Science	8 (25.0)	9 (28.1)	15 (46.9)	32 (100)	df =6
Languages	4 (12.9)	15 (48.4)	12 (38.7)	31 (100)	Sig =.606
Commerce/ Management	8 (19.5)	14 (34.1)	19 (46.3)	41 (100)	
Total	26 (17.2)	58 (38.4)	67(44.4)	151 (100)	

Table 6. Platforms used in using NMT

NMT Platforms Used*	% (N=151) (N)	NMT Platforms Used*	% (N=151) (N)
YouTube	74.8	WhatsApp	49.0
Online Newspapers	49.0	MOOCs	46.4
Facebook	35.1	Blogs	31.8
Online TV	15.2	Instagram	7.3
Twitter	6.6	Other	22.5

* This was a multiple choice question

Purpose of using NMT: Again, using descriptive statistics, the purpose for which teachers use NMTs was gauged.

Table 7. Purposes for using NMTs

Purposes	%*(N=151)
Update	84.8
Interaction	72.2
Research	60.9
Lecture	43.7
Post Assignments	36.4
Submission of Assignments	25.2

* This was a multiple choice question

Of the 151 users, 77.5% feel that when they use NMTs, students learn better, whereas 59.6% feel that students fare better, and 19.2 respondents feel that students get distracted when NMTs are used in teaching. It means that teachers find using NMTs in education is useful and effective.

Table 8. Teachers' perception of the effects of NMT on students

Perception of effects	%(N=151)
Students learn better	77.5
Students fare better	59.6
Students get distracted	19.2

Conclusion

This research tried to examine the use of new media technologies in higher education. Significantly a higher number of female teachers (in the entire sample as well as among users of new media technologies alone) tend to use NMTs in teaching - learning than their male counterparts do. This is in line with the current phenomenon of more and more female teachers opting to teach than males do. Similarly, a higher number of highly qualified people (like Ph.D. holders) use these technologies than the less qualified teachers do. In the non-classified sample of teachers, which included both the users of NMTs and the non-users, designation of teachers holds no significance to the use of NMTs, whereas among the user-only group, teachers with higher designation use them more. Similarly, source and amount of salary received by a teacher does not affect the use of NMTs; both, better paid teachers as well as others show similar pattern of use of NMTs. Neither do particular disciplines/ streams of subjects such as sciences, social sciences, humanities, commerce and management or any other professional programmes like technical, law, or nursing courses affect their NMT use pattern.

But their use at the level of the course at which the teachers teach has a significant relationship in both the classified and non-classified sample of teachers. For example, at the Masters level, many more teachers use NMTs than those teaching only at the Under Graduate level.

The age of the teachers makes a positive difference for the use of NMTs (with a mean of 35.3775 years among users against the 32.4444 years among the non-users). Younger teachers are less likely to use NMTs.

Among those not using NMTs, 43.1% have cited the lack of internet facilities as the main reason for not using them, while 22.2% have expressed a lack of conviction concerning the using NMTs. The primary reason for the first observation is more likely to be related to

the lack of wholesome development of the Kalaburgi Division in North-Eastern, and Vijayapura and North Canara, in Belagavi Division in north-western parts of Karnataka. This is ascertained by the researcher's personal visit to these areas of the state to collect data. Many colleges in this region do not have access to broadband or projection facilities in their colleges. In some places in the Northern region, the people are not able to connect even to mobile networks for lack of adequate mobile signals, making access to NMTs much more difficult (Rego, personal interviews, Aug.8-15, 2016).

Another factor that adds to the weight and value for this reason is the lack of development in terms of access to education, information technologies, transport, and wholesome development. Many teachers in the Northern and Central parts of the state expressed surprise at the possibilities of learning online, and for free. Additionally, there is constant scheduled and unscheduled load-shedding in these parts of the state. Hence, teachers find it difficult to use NMTs. Also to be noted is the fact that very few teachers (9.7%) cite ignorance at using NMTs as the primary reason for not using them, points to the possibility of they using NMTs if they were to have easy access to them (ibid.).

Among the non-users, most (80.6%) are from the unaided (or privately paid) sector, who teach in private colleges and tend to have more teaching and low-ranked administration-related work. In some of the Kalaburgi Division colleges, many of the teachers tend to teach in more than one college, leaving little time for themselves or their enhancement (ibid.). And an even bigger percentage (86.6%) of teachers among the non-users are either Assistant and Associate Professors, often without a grade, qualification, teaching or research experience. A significant number of non-users of NMTs teach at the UG level. Since India has over 35,539 colleges against the 700 universities (RUSA, 2013) and the number of students studying at the UG level far exceeds the number of students studying at the Master level, it is reasonable to state that a majority of non-users fall in this category.

Among the users of NMTs, factors such as sex, source of salaries, and the subjects taught by them, do not have a significant relationship with the use of NMTs, whereas location of teachers (urban-rural divide) in using NMTs in education, their higher designation, qualification (especially M.Phil. level), and their teaching at Masters level are significant factors which contributed positively to the use of NMTs. None of the demographic factors seems to have a significant relationship with regularity of the use of NMTs among their users.

YouTube is the most preferred/used (74.8%) digital platform for teaching in higher education. The reason given by the faculty is the repertoire of educational videos available on the platform makes it easier for them to download and use them in teaching. WhatsApp and online newspapers are the second most preferred with 49% preference each. While the wide use of WhatsApp among youth is the primary reason for using it in education to communicate with their students, online newspapers help in updating and informing them instantly on the related news. The reasons for using NMTs vary from teachers updating themselves on the subjects of their expertise (84.8%) to interaction with students (72.2%) concerning education, to using them for research purposes such as review of literature (60.9%).

Very few (25.2%) teachers use NMTs for submission of assignments by students and posting of assignments (36.4%). While 64.3% (45) urban teachers use MOOCs, 35.7% use MOOCs in rural areas. Besides the lack of facilities such as electricity and broadband internet, in the smaller towns and villages (of Kalaburgi and Belagavi Divisions), many teachers are unaware of MOOCs and the possibilities of posting and submitting assignments online (R. Rego, personal observations, August 8-15, 2016).

Of those teachers who use NMTs, many agree that NMTs are useful in higher education: (77.5%) feel that students learn better and a majority of them (59.6%) believe that students perform better in examinations, because the teachers used NMTs in teaching. Very few of them (19.2%) believe that students get distracted. This bodes well for higher education in the context of changing scenario of new media technologies, making education easily accessible and effective.

An important insight given by this research is that there is a digital divide that exists in higher education in the state, whose capital city is Bengaluru, home to IT-industry in India. The urban-rural divide does not figure in the use of NMTs in the user group; but it does play a major role in the use/non-use of NMTs in the entire sample: while 79.27% (88 out of 111) respondents from urban areas use NMTs, only 56.25% (63 out of 112) use them in rural Karnataka. This is a significant (p=.000) determinant in using new media technologies. The lack of educational, technological, and communication facilities in the less developed parts of Karnataka has adversely affected the effective harnessing of NMTs in education.

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