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## Competency analysis among faculty of agriculture universities in using educational technology

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Teachers should regulate the use of technology to enhance the ongoing learning experiences. Using of educational technology was very helpful for effective classroom teaching. The study was based on competency analysis among faculty of Agriculture Universities in using educational technology. The explorative type of research design was used. The data was collected from six Agriculture Universities. The total sample size was 180. The statistical tools used for the analysis are percentage, coefficient of correlation, Multiple regression. Most of the respondents are from urban background (62.2%). Majority of respondents fall under medium level of category in case of the following characteristics, viz., knowledge on application of ET tools, information seeking behaviour, infrastructure facilities, teachers expertise in technology use, mass media ownership, mass media exposure, extent of use adoption of ET and job satisfaction in teaching. The most of respondents have somewhat favourable attitude towards adoption of ET and moderately aware about ET. The knowledge on application of ET tools, information seeking behaviour, attitude towards ET, Job satisfaction in teaching and training needs related to ET shows significant relationship with adoption of educational technology in teaching process at 0.01 level of significance. The other characteristics of teachers such as teachers expertise in technology use, infrastructure facilities and awareness about ET shows significant relationship with adoption of educational technology in teaching process at 0.05 level of significance.

*Keywords:* teachers/faculty, adoption of technology, agriculture universities, educational technology

Competence refers to appropriate prior knowledge, skills, attitudes, and abilities in a given context that adjust and develop with time and needs in order to effectively and efficiently accomplish a task. In other words, the more competencies that an instructor possesses, the higher the propensity that courses instructed by that instructor will result in positive outcomes for a greater number of students (Amutha & Ramganes, 2013). The rapid growth of technology since the 1990s changed how teachers taught (Al-Faki et al., 2014). The world is moving rapidly towards digital media, the role of technology in education has become increasingly important. Technology enhanced learning was used to find solutions with end-users (teachers & students) and need to study the learning phenomena in the real world rather than in a laboratory (George, 2019). The role of technology in teaching stage, technology can fulfill the requirements of teachers. Digital learning education has multiple flexibilities to teach in different ways. Creative visualization is a great way to see a possible future and move towards it. The teachers can easily express their ideas by using technology (Shaikh et al., 2019; Garfield, 1997). The adoption of specific teacher roles in the instructional process may facilitate or hinder students' ability to acquire content and skills (Zhu et al., 2010). Technological developments have led to changes in educational situations, reorganization of learning environments and development of technology-based instructional systems. Computer and internet technology is the leading technological tool used in education (Erdemir, 2019). The importance of using innovative and educationally beneficial technology in the classroom is widely

recognized. Currently, technology plays numerous roles in classrooms (Huscroft-D' Angelo et al., 2019). The development of teaching mainly focuses on building teachers' capacity in development of teaching and assessment of materials as well as designing learning activities to enhance effective teaching (Lo et al., 2016). Teachers must develop the teaching skills and the capacity to solve social, interpersonal and emotional problems of learners (Jayagandhi, 2014).

The learning outcomes are key factors to develop educational patterns and improve the quality of teaching. The teacher can easily deliver their lectures, students can visually understand the practice of that lecture and take more interest in learning education. Educational Technology has facilitated the growth in interactive learning. Teacher controls and directs all aspects of learning. The adoption of new technology was based on measuring a users' beliefs and attitudes towards a technology. In particular, the adoption of new technology by the teachers will enhance the quality of teaching. Teacher gives students more options and responsibilities for their own learning if they use educational technology in teaching process. By using educational technology in teaching process there will be a following benefits such as high quality, cost effective professional development in work place, upgrading of employee skills, increased productivity, developing of a new learning culture, sharing of costs and training time with the employees, increased portability of training. It has transformed the way how knowledge is disseminated today in terms of how teachers interact and communicate with the students and vice-versa (Uttam, 2014; Garfield, 1997; Mac et al., 2014). Andronescu and Solomon (2010) and Boon et al. (2015) suggested that knowledge and skills on educational technology was important for the teachers. Results of studies such as (Sopina & McNeill, 2015) indicated the mastery in the targeted skills. Educational technology efficacy lies in the way, used by qualified

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and skilled faculty members in the teaching process (Abouelenein, 2016).

Web-based information seeking becomes more important skill for supporting both formal education and lifelong learning (Naman, et al., 2010). Information seeking behavior is the technique or the process of searching for the information, which depends on the types of information and need of the people (Amutha & Sudha, 2015). Increased access to computers, the Internet, online databases, and full-text journals necessitates reassessing online use patterns and user characteristics (Sandra et al., 2003). Teacher is a role model for the students, job satisfaction and eventually performance of teachers become very vital in the fields of education. Job satisfaction can lead to behaviors that can have either a positive or negative affect on adoption of ET. If teachers use ET then that can make their lessons more interesting, easier, more fun for them and their pupils, more enjoyable and more motivating (Mumtaz, 2000). This process should focus on the presentation and exploration of software and devices as well as on promoting positive attitudes and teacher efficacy to successfully transfer information to students (Gegenfurtner, 2011). The present study was based on competency analysis among faculty of Agriculture Universities in using educational technology with following objectives:

### *Objectives of the study*

- To study the different characteristics of teachers.
- To study the relationship between selected characteristics and adoption of ET by teachers.

## Method

### *Participants*

The explorative type of research design have been used in this study. The data was collected from six Agriculture Universities, viz., TANVAS, AAU, IGKV, PJTSAU, GBPU, & AT, HAU representing 30 faculty of each University by using questionnaire as a data collection tool. The total sample size was 180.

### *Statistical analysis and procedure*

The statistical tools used for the analysis are percentage, coefficient of correlation, Multiple regression. Technology in education has led to changes in the teaching process, taking into account the principles of universal design and accessibility; this plays a key role in moving towards methodologies that enable improvements in educational quality (Valdés et al., 2015). The study was based on competency analysis among faculty of Agriculture Universities in using educational technology.

## Results and discussion

The family background can be categorized into two categories such as rural and urban. According to Table 1 most of the faculty were belong to urban background (62.2%) followed by rural background (37.8%). It can be concluded that the faculty from urban background are more aware of technologies which is using for teaching and

*Table 1: Distribution of respondents according to their situational characteristics (n=180)*

Sl. No.	Situational Characteristic	Categories	
		Rural	Urban
1.	Family Background	37.8%	62.2%

having good knowledge about technology. Pandey (2000) also reported that the majority of respondents are from urban family background (67%) followed by rural family (29.0%).

Application of teachers' knowledge is dependent on context and interaction with students. Technology involves the generation of knowledge. The teachers require knowledge on different type of educational technology tools. The data in Table 2 indicate that 46.7 percent of the respondents had medium level of knowledge on application of ET tools followed by high (35.0%) and low (18.3%) level of knowledge for using ET tools in teaching process. This was might be because they did not get effective training programme. Sharanappa (2015) also reported that the majority of the teachers (40 percent) had high level of knowledge followed by medium (35.56%) and low level (24.44 %) of knowledge regarding application of ET tools in teaching.

The teacher's expertise in integration of technology in teaching process. Optimal integration will lead to a change in teaching, relevance for the students to meaningful learning. It was reported in Table 2 that the 41.7 per cent of the respondents had medium level of expertise in regarding use of technology in teaching process. 38.9 percent and 19.4 percent of teachers had high and low level of expertise in technology use respectively. Due to lack of training in educational technologies and most of the teachers were not familiar.

Information seeking becomes more important skill for supporting formal education. The results mentioned in Table 2 revealed that 45.0 per cent of teacher's had medium level of searching and collecting of information from various sources which was used in teaching process followed by high (40.0%) and low (15.0%) level. This was due to teachers were occasionally using sources for getting information regarding teaching in classroom. Yusuf and Balogun (2011) concluded that teachers had acquired knowledge and skill about ICT (Information & Communication Technology). According to Prabhavathi (2011) faculty active in seeking current information from the various media available in libraries, e.g., journals and electronic media.

Improvement in infrastructure facilities which leads to the enhancement of quality teaching. The data Table 2 indicate that a total of 77.8 per cent of faculty had adequate availability of infrastructure facilities in the department followed by low level (21.7%). It can be concluded that infrastructure facilities such as availability of ET tools are good at department for teaching purpose. Kishore et al. (2013) mentioned that the Universities consists adequate availability infrastructure facilities related to technology which has been used by teachers.

The owners of the media influence the content through their decisions to employ certain personnel. The data were recorded as per the mass media possessed by the teachers for getting various information related to teaching. The 52.2 per cent of the respondents had medium ownership of mass media. High and low level of ownership of mass media with 32.8 per cent and 20.0 per cent respectively. Teachers have a nature of collecting newly information that so why they have good media ownership. Due to teachers have good ownership of mass media regarding teaching. Zayim et al. (2005) also revealed that the majority of the teachers had their own technology to access.

The exposure leads to provide useful information. Mass media offers effective channels for communicating information, which can increase knowledge and influence behavior of the intended

audience. Among six universities 52.8 per cent of the respondents had medium level of mass media exposure followed by high (31.7%) and low (15.6%) level mentioned in Table 2. It may be concluded due to more use of medias like television, online journals, online data repository, computer and internet in teaching they are very helpful by the mass media for effective classroom teaching. Agboola (2006) mentioned that the teachers having high level of mass media exposure due to use of online journals, online data repository, computer and internet in teaching.

Use of ET will create a good learning environment and also enhance potential in teaching to motivate the students. The data in Table 2 indicate that majority of respondents fall under medium category (37.2%) use of educational technology like teaching materials, devices (hardware & software/application). Remaining

respondents fall under high (35.6%) and low (27.2%) categories in use of educational technology. It may be concluded that the use of educational technologies in teaching was medium due to lack of training regarding use of advanced educational technologies and lack of maintenance of available educational technologies. Adoption of ET by potential users in teaching will attract the students towards subject. The data in Table 2 indicate that 46.1 per cent of the respondents fall under medium category in adoption of educational technology while teaching. The remaining 35.6 per cent and 18.3 per cent of the respondents fall under high and low categories of adoption of ET in teaching process respectively. It can be concluded that majority of respondents are under medium level category due to lack of interest, lack of training and knowledge how to use technology.

Table 2: Distribution of respondents according to their professional and communicational characteristics (n=180)

Sl.No.	Characteristics	Categories		
		Low (%)	Medium (%)	High(%)
Professional Characteristics				
1.	Knowledge on application of ET tools	18.3	46.7	35.0
2.	Teachers expertise in technology use	19.4	41.7	38.9
3.	Information seeking behavior	15.0	45.0	40.0
4.	Infrastructure facilities	21.7	38.9	38.9
Communicational Characteristics				
1	Mass Media ownership	20.0	52.2	32.8
2	Mass Media exposure	15.6	52.8	31.7
3	Extent of use of ET	27.2	37.2	35.6
Dependent Variable				
1	Adoption of ET	18.3	46.1	35.6

Teachers' attitudes are considered as a major predictor of the use of new technologies in the educational settings. Based on the responses, it was reported that 44.4 per cent of faculty had 'somewhat favorable' attitude towards use of educational technology in teaching process. 36.7 per cent and 18.9 per cent of faculty had favorable and unfavorable attitude towards educational technology in teaching process (Table 3). The teachers have highly favourable attitude towards educational technology and they well know that the importance of educational technology in teaching in the present educational era and the this is a part of educational life, that's why educational technology are to be made to popularize by conducting workshop and training programme in the present education system to possess favourable attitude towards educational technology have positive attitude towards use of technology The teacher's positive attitude towards the use of these devices, as well as being suitably trained in their use and pedagogical possibilities are the main factors behind the correct use of technology in educational settings (Ballesta & Céspedes, 2015).

Awareness of teachers about ET will enhance the quality of teaching process. Among six universities 41.1 per cent of the faculty were moderately aware about educational technology in teaching. Full and less aware about educational technology includes 38.9 per

cent and 20.0 per cent of faculty respectively (Table 3). It can be concluded that most of the faculty were moderately aware of ET due to lack of interest to use ET or unavailability of ET in the departments. Rolfe (2012) also indicate that 50% of the teachers had aware about educational technology tools whereas, only few teachers were only heard about these kinds of tools.

Job satisfaction is either a global feeling about the job or a related gathering of attitudes about various aspects of facets of the job. Throughout their lifetime they could acquire relevant knowledge. Improving teacher's sense of job satisfaction with teaching can reduce their mental stress. The data in Table 3 indicate that the 43.3 per cent of the respondents had indicated medium level of satisfaction towards job followed by high (35.0%) and low (21.7%) level. The data concluded that the teachers are generally satisfied with their job as a teaching and this is may be due to their better performance in teaching, professional growth, work task and salary. Abouelenein (2016) indicated that effective employment of educational technology is closely related to the success of training.

To know the relationship between 'teacher's characteristics' and 'adoption of educational technology' Pearson's coefficient of correlation have been used. According to the data mentioned in Table 4 the teachers characteristics such as knowledge on application of

Table 3: Distribution of respondents according to their psychological characteristics (n=180)

Sl. No	Psychological characteristics	Categories		
		Unfavorable	Somewhat favorable	Favorable
1.	Attitude towards ET	18.9%	44.4%	36.7%
		Less aware	Moderately aware	High aware
2.	Awareness about ET	20.0%	41.1%	38.9%
		Low	Medium	High
3.	Job Satisfaction	21.7%	43.3%	35.0%

ET tools, teachers expertise in technology use, information seeking behaviour, infrastructure facilities, attitude towards ET, awareness about ET, job satisfaction in teaching, mass media exposure, training needs related to ET influence the teachers in adoption of educational technology in teaching process. The family background, family income, mass media ownership, extent of use of ET tools shows no influence on teachers in adoption of educational technology in teaching process. According to the data mentioned in Table 4 the knowledge on application of ET tools, information seeking behaviour, attitude towards ET, Job satisfaction in teaching and training needs related to ET shows significant relationship with adoption of educational technology in teaching process at 0.01 level of significance. The other characteristics of teachers such as teachers expertise in technology use, infrastructure facilities and awareness about ET shows significant relationship with adoption of educational technology in teaching process at 0.05 level of significance. It can be concluded that expect family background, family income, mass media ownership and extent of use of ET tools remaining all variables were showing significant relationship with adoption of educational technology in teaching process. The similar findings were revealed by (Sharanappa, 2015).

In case of multiple regression analysis the teacher's characteristics such as knowledge on application of ET tools, awareness about ET and training needs related to ET shows a significant relationship with adoption of educational technology in teaching process at 0.01 level of significance which was mentioned in Table 5. The remaining characteristics such as family background, family income, teachers expertise in technology use, information

seeking behavior, infrastructure facilities, attitude towards ET, job satisfaction in teaching, mass media ownership, mass media exposure, extent of use of ET tools shows non-significant relationship with adoption of ET. The data concluded that the teachers have knowledge, awareness and they require training in adoption of ET. But in case of remaining characteristics they require good infrastructure facilities, positive attitude towards ET, good information seeking behavior and high mass media exposure.

Table 4: Coefficient of correlation: Characteristics of respondents in relation with adoption of ET in teaching process

Sl. No.	Variables	Coefficient of Correlation 'r' Value
1	Family Background	-0.094NS
2	Family Income	-0.196NS
3	Knowledge on application of ET tools	0.284**
4	Teachers expertise in technology use	0.189*
5	Information seeking behaviour	0.248**
6	Infrastructure Facilities	0.156*
7	Attitude towards ET	0.254**
8	Awareness about ET	0.140*
9	Job satisfaction in teaching	0.029**
10	Mass media ownership	0.062NS
11	Mass media exposure	0.144*
12	Extent of use of ET tools	0.359NS
13	Training needs related to ET	0.236**

\*5% level of Significance, \*\*1% level of Significance, NS-Non significant

Table 5: Multiple Regression analysis: Characteristics of respondents in relation with Adoption of ET in teaching process

Sl. No.	Variables	Regression coefficient 'b' Value	p-value
1	Family Background	12.198	0.436
2	Family Income	-6.999	0.513
3	Knowledge on application of ET tools	0.878	0.004**
4	Teachers expertise in technology use	0.439	0.609
5	Information seeking behaviour	0.077	0.845
6	Infrastructure Facilities	-0.046	0.793
7	Attitude towards ET	0.043	0.364
8	Awareness about ET	0.056	0.004**
9	Job satisfaction in teaching	0.107	0.943
10	Mass media ownership	0.008	0.412
11	Mass media exposure	-0.309	0.433
12	Extent of use of ET tools	-0.136	0.161
13	Training needs related to ET	0.080	0.0007**

\*\*1% level of Significance, Multiple R<sup>2</sup> -0.564, F value- 5.931

## Conclusion

Using of educational technology was very helpful for effective classroom teaching. The following characteristics such as knowledge on application of ET tools, teacher's expertise in technology use, information seeking behavior, infrastructure facilities, attitude towards ET, awareness about ET, job satisfaction in teaching, mass media exposure and training needs related to ET were more influencing the teachers in adoption of educational technology in teaching process. This is due to good behavior of information seeking and better performance in teaching, professional growth, work task and salary. The other characteristics such as family background, family income, mass media ownership and extent of use not influencing teachers to adopt technology while teaching. This may be due to lack of interest in using educational technology by teachers in teaching process.

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