

# The Influence of Digital Transformation on Service Quality in The Education Sector

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**Abstract.** Digital transformation is the key to success in the VUCA era, including the education sector. This study aims to measure digital transformation in the education sector, particularly in higher education. This study uses a quantitative approach to address the research questions. Data collection was carried out through a survey of all employees of Universitas Terbuka via WhatsApp and email. Data analysis is carried out using SEM-PLS. The results of the study show that resources, information systems, and organizational structure and culture influence the success of digital transformation and the quality of education services. Factors that have an important role are the structure and culture of the organization. Organizational culture has a significant role in changing patterns of educational services. The implications of the study show the need to carry out similar research at several levels of education, such as digital transformation in primary, secondary, and tertiary education on face-to-face learning.

## 1 Introduction

In the digital era, many organizations have begun to carry out digital transformation for business interests in order to maximize profits by utilizing information technology [1], [2]. Digital transformation is a change in work patterns and culture that initially used data sources in the form of analog to become digital using the help of information technology ([3]. Digital transformation is a process of change carried out by service or manufacturing companies to find new gaps that can be used to improve products or services by utilizing technology [4]. While digital transformation is a tool that can make changes in organizational aspects, culture and business processes to meet market demand by utilizing information technology [5]. The Covid-19 pandemic has forced the education sector to utilize ICT in the learning process and its management, both in primary, secondary and higher education.[6] [7]. The use of IT

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in the education sector in Indonesia is supported by government policy. In general, the implementation of education during the Covid-19 pandemic is carried out in three forms, namely full distance learning, limited face-to-face learning, and blended learning. Efforts made by the government in recovering education services due to the Covid-19 pandemic, namely by adjusting learning policies during the Covid-19 Pandemic.

The use of information technology in the higher education sector has long been implemented by organizations that implement distance education. Universitas Terbuka (UT) is a government agency mandated by the government to provide higher education with an open and distance model. The purpose of the mandate is to expand access to higher education for all citizens in order to overcome the problem of limited capacity of higher education available in Indonesia.

The use of information technology in UT is getting attention because with IT Education programs can be held in a wide range, efficiently, and can be adjusted to the needs. Therefore, the use of IT is suitable for mass learning, as applied by UT. In 2023, the number of UT students will be 439,222 students, spread throughout Indonesia and abroad. Here is the distribution of students by faculty category.



**Fig 1.** Student Distribution by Faculty

As a university that organizes mass education, IT has an important role in academic / non-academic learning and management. According to the Long-term development plan, UT governance is defined in the design of the Digital Learning Ecosystem, as part of the digital transformation. The success of digital transformation is influenced by digital competence, which in turn will improve the quality of service to stakeholders. Currently, the number of UT employees is 2,488 employees, divided into 716 lecturers and 1,772 education staff, With limited employees compared to the number of students, digital competencies of both lecturers and education staff are needed and how they affect the success of digital transformation which ultimately affects the quality of service to UT stakeholders. This article aims to measure the relationship of digital competence to digital transformation and service quality.

## 2 Literature Review

There are several factors that can influence the occurrence of digital transformation, namely changes in consumer behavior, changes in regulations, changes in competitive markets and industry shifts into digital form [8]. The purpose of the company carrying out digital transformation is to explore and develop business models, make better product innovations

for goods or services, expand distribution networks, get closer to consumers to find out what consumers want [9]. Meanwhile, the purpose of digital transformation is the process of elaborating the limitations or affordability of companies related to digital technology, so that with the digital transformation of companies or organizations can make better products and services [10].

Digital transformation itself is divided into three stages [11]:

1. The first stage is a digitization. Digitization itself is the first stage in carrying out digital transformation, digitization itself is a stage where companies change their information sources that were originally analog or physical into digital form.
2. The next stage is a digitalization. Digitalization is a digital data conference, so that companies can create or improve business processes by utilizing digital technology.
3. The stage of a digital transformation, which is a change made by the organization starting from the overall processes and activities to digital form with the use of information technology so that there is very little interaction with humans because all activities are carried out by the system.

Based on European Commission Index DESI /Digital Economy and Social Index [12], the success of digital transformation is influenced by digital competence and digital transformation which affects customer satisfaction. Although the DESI is designed for European societies that are already advanced in digital technology, the needs of digitalization transformation for the benefit of everyday life are universal, meaning that in forming a digital society (society 4.0) these same indicators can be used for other communities. Digital interaction become the norm to accelerate public services for businesses and also citizens to be fully online. Effective e-government can provide a wide variety of benefits including more efficiency and savings for both governments and businesses. It can also increase transparency and openness. Services for citizens are less likely to be available online when compared to services for businesses. Transparency and openness of services are part of the accountability of public organizations to the stakeholder and community [13]. Measures aimed at digitalising public services and at introducing or improving e-government solutions. The hypotheses developed in this study are as follows:

- H1: Digital Competence influences digital transformation.
- H2: Digital Competence influences service quality.
- H3: Digital Transformation influenced service quality.

## **3 Method**

### **3.1. Data Collection and Sample**

This article uses a quantitative approach that aims to assess the relationship between digital competence, digital transformation, and service quality in the higher education sector. This article uses a survey with online questionnaires to collect data via WhatsApp Group. In total, there were 93 respondents (fully anonymized) in the survey. The sample was representative of the UT employees in terms of gender, length of work, and role.

### **3.2. Measures**

Responses were on a five-point scale from strongly disagree (=1) to ‘strongly agree’ (=5) for questions related to digital competence and digital transformation and on a five-point scale from extremely low (=1) to ‘extremely high’ (=5) for questions related to service quality in higher education.

#### **3.2.1. Digital Competence**

Digital competence indicators include competency improvement in creating valuable academic work (X1.1), ability to process and analyze data & information (X1.3), improved skill in decision-making (X1.4), as well as partnership and collaboration ability (X1.7). The indicators and questionnaire are modified from digital transformation research [14]

#### **3.2.2. Digital Transformation**

Indicators of digital transformation include information systems (X3) and organizational structure and culture (X4). The indicators and questionnaire are modified from digital transformation research [15].

#### **3.2.3. Service Quality**

Service quality indicators encompass aspects of the attitude and behavior of UT Academic Staff (Y1), administrative process (Y2), curriculum (Y3), attitude and behavior of lecturers (Y4), academic competence of lecturers (Y5), pedagogy (Y6), support infrastructure (Y7), and learning setting (Y8). The indicators and questionnaire are based on HESQUAL model [16].

### **3.3. Data Analysis**

The data collected by researchers on digital competence, digital transformation, and service quality were analyzed based on the objective of the study. With the help of the Smart Partial Least Square (PLS) version 3.0, the researchers generated results of path coefficient, inner and outer model, as well as performed bootstrapping analysis to analyze the significance of each variable.

## **4. Result**

### **4.1. Demographic Analysis**

Table 1 below showcases the demographic distribution of the sample. It shows the proportion of the sample according to gender, level of education, role, and period of employment. Most of the sample is male. Most of them are lecturers who have master’s degrees. It also shows that the majority have periods of employment between 1-5 years, 16-20 years, and above 25 years. This is due to the recruitment of employees (civil servants) in Universitas Terbuka are carried out at certain periods and appointed collectively (class)

**Table 1.** The Demographic Distribution of Sample

Characteristic	Frequency	Percentage
Gender		
<b>Female</b>	42	45 %
<b>Male</b>	51	55 %
Level of Education		
<b>High School</b>	1	1 %
<b>Bachelor's degree</b>	11	12 %
<b>Master's degree</b>	51	55 %
<b>Doctoral Degree</b>	30	32 %
Role		
<b>Lecturers</b>	80	84 %
<b>Academic Staffs</b>	13	16 %
Period of Employment		
<b>&lt;1 Year</b>	3	3 %
<b>1-5 years</b>	24	26 %
<b>6-10 years</b>	1	1 %
<b>11-15 years</b>	8	9 %
<b>16-20 years</b>	23	25 %
<b>21-25 years</b>	10	11 %
<b>&gt;25 years</b>	24	26 %

#### 4.2. Measurement Model Assessment

To ensure the soundness of the measurements employed in this study, a comprehensive assessment of the measurement model was conducted. This assessment encompassed the application of factor analysis and the evaluation of indicator reliability. The findings obtained from this evaluation indicate that the outer loadings of items within each construct surpass the recommended threshold of 0.7. Additionally, the internal consistencies of the constructs, as measured by Cronbach's Alpha, exceed the minimum acceptable value of 0.7. Moreover, the average variance extracted (AVE) for each construct exceeds the threshold of 0.5, thereby providing evidence of the discriminant validity of the constructs. For a detailed account of the measurement assessment outcomes, please refer to Table 2.

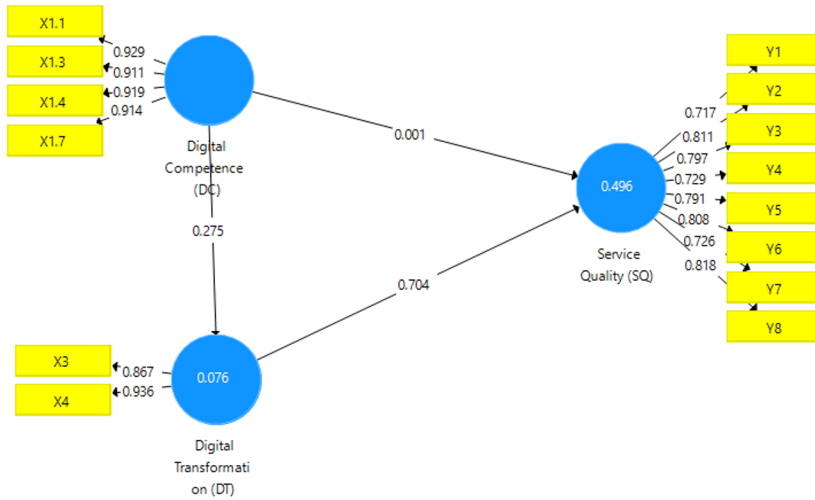
**Table 2.** Construct Validity and Reliability

Constructs & Items	Loadings	Cronbach's Alpha	CR	AVE
<b>Digital Competence</b>		0.939	0.955	0.843
X1.1	0.929			
X1.3	0.911			
X1.4	0.919			
X1.7	0.914			
<b>Digital Transformation</b>		0.778	0.897	0.814
X3	0.867			
X4	0.936			
<b>Service Quality</b>		0.905	0.923	0.601
Y1	0.717			
Y1	0.811			
Y3	0.797			
Y4	0.729			
Y5	0.791			
Y6	0.808			
Y7	0.726			
Y8	0.818			

After conducting an evaluation of the measurement model and analysing its findings, the data analysis proceeds to the examination of the structural model. This assessment aims to scrutinize the predicted relationships between constructs and the predictive capabilities of the conceptual model.

### 4.3. Structural Model Assessment

After conducting PLS-SEM analysis, the hypothesized relationships as well as path coefficients between constructs were evaluated. The results as indicated in Figure 1 suggested the positive effects of three contextual constructs, namely digital competence, digital transformation, and service quality.



**Fig 2.** Structural Model Assessment Results

In terms of the predictive capacity of the model, the  $R^2$  values are evaluated for three predicted constructs (see also Figure 2). As suggested by (Hair et al., 2011), the cut-off points used for assessing the  $R^2$  values were 0.25 (described as weak), 0.50 (described as moderate), and 0.75 (described as substantial). Based on the PLS algorithm, the results show that the  $R^2$  for digital transformation is 0.076 and 0.496 for service quality. This suggests that digital competence explains 7.6 % of the variance of digital transformation, and digital competence through digital transformation explains 49.6 % of the variance of service quality. This suggests that the conceptual model holds a weak predictive capacity in explaining digital transformation and service quality in higher education.

To be considered significant, the magnitude of path coefficients should be more than 0.1 [14]. In this case, path coefficients in contextual constructs (H1 and H3) in the structural model satisfy this criterion.

**Table 3.** Structural Path Estimates

Hypotheses	Path	Coefficient	T-Statistics	P-Values
<b>H1</b>	DC -> DT	0.275	3.190	0.002
<b>H2</b>	DC -> SQ	0.001	0.009	0.993
<b>H3</b>	DT -> SQ	0.704	14.040	0.000

To further examine the model's hypotheses, t-statistics are evaluated. As shown in Table 3 above, two of the hypotheses, namely digital competence towards digital transformation (H1) and digital transformation towards service quality (H3) were strongly supported. Only digital competence towards service quality (H2) is rejected, as its t-statistic is lesser than 1.96 and the p-value is more than 0,05.

## 5. Conclusion

The results of the study show that the current state of digital competence of 2,488 employees (716 lecturers and 1,772 educational staff) has a strong relationship with digital transformation (H1). This means that the knowledge and practice of knowledge as well as the dissemination of digital employee knowledge at the UT have a strong relationship with readiness to face and go through digital transformation in their work. Therefore, these findings also confirm that digital transformation elements also have a strong relationship to service quality. This confirms that digital transformation is driven by knowledge readiness, shared knowledge and practices that are closely related to digital competence. However, the digital competency factor is not closely related to service quality elements. This condition confirms that there are other elements that affect the achievement of service quality, but not mere digital competence. These other elements become the implications of digital competency research with the process and results of improving the quality of distance education services at the UT.

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