

# ICT and Leadership Styles-Level of Leadership Competence of Educational Leaders

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## Abstract

Researchers have studied the leadership styles of educational leaders in connection with their level of computer use and success in integration of ICT. This study aims to reveal if the leadership style can be a predictor of competent technology leaders. The importance of this study is to investigate the leaders' competency as technology leaders rather than level of perceived use of technology, using Technology Leadership Competency Scale for Education Administrators which is adapted from International Society for Technology and Education (ISTE) standards for Education administrators. Fifty educators, who take leadership or administrative roles in educational institutions from the Eastern part of Malaysia as scope, completed Multi factor leadership questionnaire (MLQ) developed by Bass. The results indicate moderate correlation between both transactional and transformational leadership styles. It is concluded that leadership style is not a predictor of competency level of technology leadership. The study contributes into literature discussing the effects of cultural differences in different countries on desired leadership styles, which in result may affect the level of technology leadership competency. In addition, it also argues that leadership style characteristics cannot be used as a method to transform education.

**Keywords:** Leadership style, Technology leadership, Information Systems, ICT, Malaysian Education.

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## I.Introduction

Educational technology, technology integration into education and effective application of technology within the context of education have been examined in many studies. Furthermore, there are countless policies and procedure documents relating to technology that have been developed by

educational institutions, various educational institutions including universities, and governments [1].

Among educational leaders, the effective utilization and integration of technology in educational institutions has been emphasized. Somehow, it was not until very recently that the

incorporation of both educational technology and the practices of educational leadership has gained significance among scholars [2].

The examination of technology and educational leadership has involved the application of numerous terms including online leadership, IT leadership, educational institutions technology leadership, virtual or digital leadership, leadership of virtual teams and of online communities, ICT leadership or educational technology leadership [3]. As can be observed, there are so many terms relating to the subject under study and many of these terms show ambiguity. For these reasons, more studies would be needed in order to increase the understanding on educational leadership and educational technology. Furthermore, from the reviewed literature on e-leadership, it was evident that the subject still requires more exploration [4]. Notably, both educational leadership and educational technology as a research domain is consistently growing in terms of quantity and impact. Somehow, e-leadership is yet to be fully addressed as a concept of research. The present study will therefore attempt to explore two concepts namely styles of leadership and educational technology in combination, and scrutinize the connection that exists between both [5].

## **II. Literature Review**

### **2.1. Leadership and Leadership Styles**

The concept of leadership has been studied since the 50's among theorists of trait who endeavoured in ascertaining the characteristics that are attributed with a successful leader. In the delineation of such leader, relevant theorists have been focusing on behaviour and style, as opposed to the characteristics of an individual. There are many theories on leadership that have been developed. Furthermore, styles of leadership have been defined as well. Based on Leadership Theory, transformational leadership encompasses the attainment of motivation and morality of greater

levels following the interaction of people with one another [6]. Meanwhile, transactional leaders are described those holding the authorised power and control, for such leaders, their focus would be on achieving the short term goals. In Burns, the concepts of transformational and transactional leadership are described as a separate scale [7].

Meanwhile, theory of Transformational Leadership views styles of Transformational and Transactional Leadership to be discrete leadership style dimensions. Further, in measuring leadership styles, Multi-factor Leadership Questionnaire was constructed by Bass, and theory of Transformational Leadership employing the description was established by Burns in fashioning leadership as a conceptual basis [8]. In the conceptualization of both transformational and transactional leadership, a total of seven factors associated with leadership have been proposed by early studies, but the factors were reduced by Burns into six factors (charisma, intellectual stimulation, management by exception, contingent reward, individualized consideration, and laissez-faire leadership) after a comprehensive scrutiny [9].

The GLOBE study is a relevant study that looked into the link between cultures and styles of leadership, and it initially employed 21 scales of leadership but the scales were later decreased to six styles of leadership, comprising the following: autonomous style, participative style, humane style, self-protective style, performance-oriented, and team-oriented [10]. Modified based on the culture embraced in Eastern part of Malaysia, Multi-factor Leadership Questionnaire was established with the inclusion of Charisma & Intellectual Stimulation as well as Individualized Consideration factors for measuring the transformational style of leadership, while Contingent Reward and Management by Exception factors were included for measuring the transactional leadership styles [11].

Accordingly, the employed factors in GLOBE study include Charisma, Intellectual Stimulation, Individualized Consideration, Contingent Reward, and Management by Exception [12]. In terms of the operational definitions of the factors, charisma furnishes subordinates with a well-defined invigorating sense of purpose. Charisma also provides an example for ethical behaviour and the connexion with the leader alongside his/her expressed vision. For the factor of Intellectual Stimulation, it involves the encouragement to subordinates in questioning the trustworthy manners of resolving problems, and in questioning the utilized methods in improving them [13]. The factor of Individualized Consideration relates to the comprehension of the needs of each subordinate and the consistent efforts in stimulating them in developing their maximum potential. In terms of Contingent Reward, it provides clarification on what the subordinates are supposed to achieve and what would be awarded to them should they fulfil the expected performance level [14]. For the factor of Management by Exception, it is associated with the monitoring of task performance for any potentially emerging issues and rectifying them to preserve the existing levels of performance [15].

It appears that researches in the field of leadership styles, particularly GLOBE, did not take into account the leadership styles in the environment of educational institutions. Notably, based on Transformational Leadership Theory, leadership within the context of educational institutions and within the context of business appears to be comparable [16]. Somehow, the existing literature shows that among some scholars, continuous spectrum of leadership styles were discovered where several researchers' theory in which transformational and transactional leadership styles denotes the contradictory ends of the range of leadership.

## **2.2. Educational Technology and Leadership**

The impact imparted by style of leadership and educational technology within the associated domain has been explored. In particular, the link between leadership and ICT usage has been affirmed. In the context of Tehran among 30 principals for example, a solid positive link between transformational style of leadership and computer usage has been concluded. Additionally, in a study on the viewpoints of 80 educational institutions lecturers concerning the positive impact of the practices of transformational leadership on ICT integration in teaching, 8 dimensions representing transformational style of leadership were employed as follows: intellectual stimulation, individualized support, high performance expectations, developing shared vision, building consensus, modelling behaviour, building collaborative structures and strengthening educational institutions culture. Accordingly, the obtained outcomes proved that all of the dimensions could positively impact the ICT integration into teaching [17].

Meanwhile, at the national levels, countless of standards for administrators, lecturers and students for the attainment of competency in technology use have been developed by policy makers. Contrariwise, for educational administrators/leaders, not many institutions have established the technology competency standards. Among the few that did was the International Society for Technology and Education (ISTE) [18]. In particular, ISTE established a scale for measuring the competency of technology leadership among administrators of educational institutions. Previously known as NETS, ISTE Standards for Administrators (ISTE Standards •A) have been established to evaluate the skills and knowledge possessed by administrators and leaders of educational institutions [19]. A total of five dimensions are used as follows: Digital citizenship, Digital age learning culture, Visionary

leadership, excellence in professional practice, and Systematic improvement [20].

In this study, for the attainment of full technology integration for the promotion of excellence and the support of change in the entire organization, three dimensions are employed. They are: Visionary Leadership whereby Educational Administrators instigate and steer the establishment and employment of a shared vision, Systematic Improvement whereby Educational Administrators furnishes the digital age leadership and management for the consistent organizational improvement via the effectual application of information and technology resources, and Digital Citizenship whereby Educational Administrators demonstrate and ease the comprehension of issues related to society, ethics and legalities and accountabilities associated with the progressive digital culture [21, 22].

### III. Methodology

#### 3.1. Statement of Purpose

This work attempted to examine the link existing between styles of leadership practised by leaders in the institutions of education. Accordingly, the Multi-Factor Leadership was used in measuring the styles of leadership employed by these leaders. Further, the Scale of Technology Leadership Competency for Education Administrators.

#### 3.2 Sample and Data Collection

Educators playing the role of leadership or administration in education institutions operating within the region of Eastern part of Malaysia made up the study population. Accordingly, a total of 51 educators fulfilling the criteria were chosen as sample. Owing to questionnaire incompleteness, one respondent was excluded during the data analysis. Data were obtained from one group of participants who were present at educational leaders' conference and the method of convenience sampling was used in the selection of participants.

The method was chosen owing to its convenience particularly with respect to availability of respondents.

The present study encompasses a correlational research, and is part of a quantitative research. The qualitative and quantitative data were gathered via questionnaire, and the items in the questionnaire were furnished with Likert scale for gauging the styles of leadership and the leaders' level of technology leadership competency. The use of qualitative data in this study was for the delineation of the role played by leaders in the organization, their age, gender and educational background, the tools of technology that they employ, and the average amount of time they would spend using the computer and the internet. The qualitative data were then transformed into numerical data prior to being processed by the SPSS software package.

#### 3.3 Instruments

As this study was carried out among Malaysian leaders, the Multi-Factor Leadership Questionnaire (MLQ) was translated into Malaysian language (Bahasa Malayu). Besides that, several modifications were made in order to assure its appropriateness with the context. There were 22 items included in the questionnaire, 10 of which gauged the transactional style of leadership whereas the remaining 12 items gauged the transformational style of leadership. The questionnaire items were supplemented by a five-point Likert scale each, where 5 denotes 'Always' and 1 denotes 'Never.' For the factors of transformational leadership style, the attained Cronbach Alpha coefficient was 0.81, and for the factors of transactional leadership style, the attained value was 0.58. In terms of test values, the obtained value for transformational leadership style factors was 0.831, while that for transitional leadership style factors, the attained value was .712.

The measurement of the competency level of the administrators as leaders of technology was carried out using the scale of technology leadership competency for Education Administrators. Accordingly, the standards of technological leadership used in this study was created by ISTE. In this study, the standards were transformed into questionnaire items with four-point scale (4: Always, 1: Never). In total, there were 14 items included in the questionnaire, 3 of which measure the dimension of Visionary Leadership. Further, 6 items measure the dimension of Systematic Improvement and the remaining 5 items measure the dimension of Digital Citizenship of technology leadership. Coefficient of Cronbach Alpha was ascertained for this measurement tool and the obtained value was 0.97, which denotes high reliability. Further, factor analysis was carried out in this study and the obtained values of Lambda of the factors fall within the range from .73 to .88, implying that the instrument is highly valid.

The measurement of style of leadership and the technology leadership competency level of leaders in the survey involved four parts as follows: Part 1 comprises demographic items (i.e., age, gender, level of education, occupation, daily mean time of Internet usage, daily mean time of computer use, and the employed technology), Part 2 involves items associated with the institutions of education (e.g., location, ease of access to computers and internet by staff and students). Part 3 involves items of Multi Factor Leadership Questionnaire, while Part 4 presents items covering the Scale of Technology Leadership Competency for Administrators of educational institutions.

#### IV. Analysis and Results

As can be observed in Table 1 on the participants' demographic information, the age of participants was in the range of 23-53 years, and the mean age was 35. Further, the table shows that on a daily basis, the participants spent roughly more than 3 hours using their computers and/or internet.

Notably, the usage information does not signify the time used for just instructional purposes.

Table 1: Demographic information of participants

|                                     | Mean | SD  |
|-------------------------------------|------|-----|
| Daily Computer Use (hours)          | 3.3  | 2.6 |
| Daily Internet Use (hours)          | 3.0  | 2.6 |
| Number of Technological Device Used | 2.9  | 1.1 |
| Age                                 | 35   | 8.5 |

The style of leadership practiced by participants appears to encompass a blend of both components of transformational and transactional style of leadership. From Table 2, the obtained values of mean and standard deviation of style of leadership alongside its dimensions demonstrate that the participants practice both styles of transformational leadership ( $X=3.16$ ) and transactional leadership ( $X=3.40$ ).

Table 2: Participants' scores on leadership style factors

|                                                           | Mean | SD   |
|-----------------------------------------------------------|------|------|
| Transformational Leadership                               | 3.16 | 0.54 |
| Charisma                                                  | 3.40 | 0.51 |
| Intellectual stimulation and individualized consideration | 2.91 | 0.63 |
| Transactional Leadership                                  | 3.40 | 0.47 |
| Contingent reward                                         | 3.28 | 0.51 |
| Management by exception                                   | 3.52 | 0.51 |

Note: The rating of each item was based on 5-point scale, with the range of 1= not at all to 5= always.

As Table 2 is also showing, the factor of Charisma of Transformational Leadership style and the factor of Management by Exception of Transactional Leadership style achieved the highest values of mean at respectively 3.40 and 3.52.

Table 3: Participants' scores on technology leadership competency dimensions

|                                  | Mean | SD   |
|----------------------------------|------|------|
| Visionary Leadership             | 2.37 | 0.57 |
| Systematic Improvement           | 3.93 | 0.54 |
| Digital Citizenship              | 2.90 | 0.49 |
| Technology Leadership Competency | 3.07 | 0.40 |

As shown in Table 3, the obtained mean value of the level of technology leadership competency demonstrates that the participants view themselves as proficient in technology leadership nearly all the time. From the obtained outcomes, the dimension of visionary leadership scored the lowest mean value of 2.37, while the dimension of systematic improvement scored the uppermost mean value (3.93).

The values of Pearson correlation coefficient achieved for style of leadership, factors of leadership style, level of technology leadership competency alongside its dimensions are displayed in Table 4. Accordingly, strong correlation ( $p < .01$ ) can be observed for the transformational leadership style and factors, and for the transactional leadership style and factors.

Additionally, there appears to be a strong correlation between the technology leadership

competency level and the contingent reward factor of transactional style of leadership. Besides that, the dimension of visionary leadership of technology leadership competency appears to have no correlation or is correlated but imperceptibly ( $-0.1 < r < +0.1$ ) with transformational and transactional styles of leadership and with all the factors related to these relationship styles with the exclusion of the factor of contingent reward at  $r = 0.16$ . Hence, it can be stated that a leader's style of leadership is not predictable by the leader's visionary leadership competency level. Additionally, owing to the high reliability value of the Education Administrator's scale, a strong correlation ( $p < .01$ ) was projected to exist between the competency level of technology leadership and each of its dimensions.

Lastly, there appears to be a moderate connexion between the level of technology leadership competency and transformational style of leadership at  $r = .33$ , and its factors ( $r = .29$  &  $r = .33$ ) along with the transactional leadership style at  $r = .36$ .

Table 4: Correlations Matrix between variables

|                                                                | TF    | CH    | II    | TS    | CR    | ME    | TLC   | VL    | SI    | DC    |
|----------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>Transformational Leadership (TF)</b>                        | 1     | .94** | .96** | .84** | .69** | .86** | .33*  | -0.01 | .52** | 0.25  |
| Charisma (CH)                                                  | .94** | 1     | .81** | .82** | .66** | .86** | .29*  | -0.06 | .58** | 0.16  |
| Intellectual stimulation and individualized consideration (II) | .96** | .81** | 1     | .78** | .64** | .79** | .33*  | 0.03  | .43** | .30*  |
| <b>Transactional Leadership (TS)</b>                           | .84** | .82** | .78** | 1     | .92** | .92** | .36*  | 0.05  | .51** | 0.26  |
| Contingent reward (CR)                                         | .69** | .66** | .64** | .92** | 1     | .70** | .41** | 0.16  | .47** | .31*  |
| Management by exception (ME)                                   | .86** | .86** | .79** | .92** | .70** | 1     | 0.25  | -0.05 | .47** | 0.17  |
| <b>Technology Leadership Competency (TLC)</b>                  | .33*  | .29*  | .33*  | .36*  | .41** | 0.25  | 1     | .74** | .72** | .82** |
| Visionary Leadership (VL)                                      | -0.01 | -0.06 | 0.03  | 0.05  | 0.16  | -0.05 | .74** | 1     | 0.18  | .45** |
| Systematic Improvement (SI)                                    | .52** | .58** | .43** | .51** | .47** | .47** | .71** | 0.18  | 1     | .45** |
| Digital Citizenship (DC)                                       | 0.25  | 0.16  | .300* | 0.26  | .31*  | 0.17  | .82** | .45** | .45** | 1     |

## V. Conclusion

The leadership style that is linked to computer usage level or the incorporation of ICT into

teaching was explored in this paper. Relevantly, several studies have looked into the level of technology or computer usage among leaders. Somehow, only a handful of studies have looked

into the competency of these leaders on technology leadership. Furthermore, studies that found association between transformational style of leadership and (perceived) computer usage level are not always perceiving the competency of transformational leaders as leaders of technology. Accordingly, based on the reported connexion between the perceived level of computer use and leadership style, the application of the components of transformational leadership for the principals of educational institutions in the context of Iran has been proposed, for the purpose of transforming the educational institutions with the application of ICT. Somehow, it is possible that principals with frequent ICT usage do not have the competency in transforming educational institutions.

The present study attempted to find out if the style of leadership can predict competent leaders of technology. Furthermore, for leaders, it would seem illusory to embrace the characteristics of leadership style as good practices of leadership, as reported in the initial works on styles of leadership that attempted to discover the most optimum way of leading. A leader that embraces both transformational and transactional styles of leadership is regarded as a successful leader and this is proven by a positive connexion between both styles of leadership.

Table 4 demonstrates the moderate and equal link between both transformational and transactional styles of leadership and the competency level of technology leadership. The obtained outcomes further prove that the competency level of technology leadership does not predict the style of leadership that a person practices. This owes to the fact that the moderate link between technology leadership competency level and the values of transformational and transactional leadership styles do not appear to significantly differ. Moreover, a solid relation between transformational leadership and the incorporation of ICT into teaching is a technology leadership competency indicator. Notably, the blending of ICT

into teaching is primarily dependent on lecturers owing to the technology distribution among people. As such, technology leadership is regarded as a characteristic of educational institutions, not that of the principal.

It is possible for a leadership behaviour to differ based on countries. Subsequently, based on countries, one style of leadership may benefit followers in a distinctive manner. Countries are known to be part of distinctive clusters of culture and for this reason, the impact of leadership style on technology leadership competency of a given person may vary owing to the study situation. Hence, this paper agrees with the view that a person's leadership style is not closely linked with technology leadership competency level.

## VI. Limitations and Suggestions

Those that took part in the present study were administrators, directors, and deputy directors from diverse institutions of education, and it is possible that these partakers were not part of learning process. For this reason, the present study excluded the two technology leadership competency scale dimensions that are closely linked to the learning process. They are: excellence in professional practice and digital age learning culture. Hence, future studies should employ a comprehensive technology leadership competency scale through the use of superior sampling techniques and sample of bigger size.

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