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DIGITAL TRUST IN THE ACADEME: PEOPLE, SOFTWARE, AND HARDWARE

Abstract. Information technology plays a critical role in educational management and administration. With information technology integral to shaping trust in the workplace, this paper aims to determine digital trust in educational institutions. Specifically, this article presents the measurement of digital trust level in terms of hardware, software, and people in educational institutions. It also shows the relationships and differences between digital trust and the respondents' socio-demographics, employment, and technological profiles. An online survey questionnaire was utilized using the Marcial-Launer Digital Trust in the Workplace Questionnaire, with 878 responses from academic institutions analyzed. A 4-point forced Likert scale and weighted mean were used to measure the level of trust. Chi-square and one-way ANOVA were utilized to determine significant relationships and differences, respectively. A multiple regression was calculated to predict the level of digital trust on the profiles of the respondents. The results illustrate a moderate level of confidence in electronic devices, hardware and software systems, information systems, and people with access to technology in academic workplaces, with a mean of 2.92. The results also show that sociodemographics, employment profiles, and technologic profiles appeared to be significantly related, at the same time showing differences in the level of digital trust. Gender, income level, and connectivity satisfaction were significant predictors of the level of digital trust in the academic sector. Therefore, it is concluded that there is reasonable trust in information technology in terms of hardware, software, and people in academic institutions. Teachers and non-teaching staff have adequate confidence in electronic devices, hardware and software, information systems, and people who have access to digital technology in the academic working environment. It is recommended that IT departments and similar offices orient, guide, and train employees on the use of electronic devices, for them to be familiar with and confident in using such technology. School administrators need to exert more effort to augment the trust levels among their employees.

Keywords: academic workplace; computer system; digital trust; ICT management, information technology in education.

1. INTRODUCTION

The academe is a workplace run not just with academicians but also with information technology. Studies show that computers play a vital role in any academic and administrative operations of educational institutions [1][2]. Generally, there are three basic elements of a

digital system that schools need to consider to leverage their competitive advantage. This system includes hardware, software, and people in the form of peopleware [3][4].

The hardware, also known as computer machinery and equipment, comprises tangible elements of a computer or electronic system, which includes the components, or the internal parts which ensure that the system is functional, such as circuit boards, memory, CPU, cabling, and power supply; it also comprises the peripherals or the external hardware in the form of a monitor, a keyboard, a mouse, printers, scanners, among others [5].

The computer software is simply an entity in the form of instructions that command or direct the physical computer on what to do, how to execute a task and solve a problem. This instruction is generally described as computer programs, applications, scripts, instruction sets, procedures, and routines [5]. There are three types of software, namely the system software, the application software, and the network software. The main function of system software is internal and overall function control through an operating system; the application software facilitates the execution of commands that are submitted or provided by a user, thus functions as the user's data processor; and network software does the works in communicating between networks [5].

"People can be the most important element in most computer-based information systems" (Stair and Renokls, 2010, cited in [6]). The people aspect in the computer system is the most essential for the operation to take place effectively in a workplace. However, most of the problems that arise within the system are due to human error. This accounts for the essence of people in the computer system [6]. In the computing world, people or users are referred to as *peopleware*, the term referring to the roles and attitudes of humans in the development and utilization of hardware or software. Specifically, it is described as "the structure of objects that humans have in their minds...when dealing with hardware and software" [7]. Simply put, these people are those who are involved in the development and utilization of a computer system.

The problem statement. The growing use of digital technology in academic society has established its powerful capacity and value while unraveling digital technology's challenges, which includes trust in people, software, and hardware [8]. In today's technological advancements, problems and limitations arise for many reasons, such as business models organizational priorities. Despite educational innovations and use of technology, digital trust is still challenging to measure and define, as supported in the framework of Marcial and Launer in 2019 [6]. This paper is anchored on the concept that digital trust "underpins every digital interaction by measuring and quantifying the expectation that an entity is who or what it claims to be and that it will behave in an expected manner" (Gartner Inc., 2017, cited in [6]). Applying this definition to the academic context, what is the level of digital trust in the academe?

Analysis of recent studies and publications. Trust in the academic context is still vital in building relationships and learning progress [9]. Establishing trust between teachers and staff is done in such a way that an honest conversation about learners, learning practices and improvements, and academic impact can be freely and comfortably exchanged [9]. This suggests that when digital technology is added into the picture, trust is security, comfort in collaboration, support, freedom of expression, and an empowering process.

The constant update of hardware and software has led to the current status of information technology (IT). A definition of IT that has transcended innovations is IT as "solutions that provide support of management, operations, and strategists" in institutions (Thong and Yap, cited in [10]). With the presence of the Internet, information technology later progressed to a technology or procedure mainly utilized by an institution in handling information that involves advanced computing and information and communications technology as well as the technology integrated into the teaching and learning process of institutions [11]. In the advent of the Fourth Industrial Revolution (4IR), information technology is now transformed into hardware innovations that are highly compatible with the complexity of the information

systems and applications of the current times and IT trends. With this wide array of technologies embedded in schools, information technology is integral to shaping digital trust in academic institutions.

There is the silent question of what and who to trust in digital technology in the academe. In basic education, the school principal plays a critical role in building trust not just among teachers and academic employees but also in the implementation and use of digital technology, with the principal's trust in using digital technology being a significant impact on the school's trust in information technology [9], [12]. Universities worldwide have structured their own framework when it comes to digital trust in the academe. Arizona State University has Information Security and Digital Trust (ISDT), which is founded based on the principles of "transparency, security, privacy, and empowerment to foster relationships of trust" between teachers, learners, staff, other institutions, and the workforce as a whole [13]. They are working on initiatives and projects on information security (GetProtected), data handling (TLN), digital trust summit, and professional partnerships for cybersecurity strengthening (Partner to Protect) [13]. The Mohammed VI Polytechnic Institute (UM6P), through the Digital Learning Lab, addressed digital trust not just within the institute but acted as an intermediary among online education stakeholders in Morocco and Africa as they tried to achieve a digital trust ecosystem for education. The organization's key initiatives are as follows: (1) special circumstances and strong ecosystems can accelerate building trust relationships; (2) technology and data enable bridges to be built—trust allows people to cross them; (3) leadership in a time of crises creates alignment and trust for a more significant impact. In the end, UM6P became successful in gaining trust by leveraging on the new digital ecosystem that was the result of a sound IT infrastructure, great expertise in digitalizing content and building platforms in the last five years, rich knowledge in research and innovation, expertise in digital education, and strong partnerships. Not only are they a model university in Morocco and Africa, but they also are successful in making the trust bridge real by earning that trust and becoming partners with the government for other institutions to utilize the digital technology they have created. This resulted in a lasting effect of partnership and trust and yielded greater impact on digital trust in times of crises within Morocco and Africa [14].

The research goal. This paper aims to measure digital trust in the academic sector. Specifically, this paper presents the trust levels in information technology in terms of electronic devices, hardware, and software features, operation of information system features, and trust in people with access to digital technology in the academic sector. It also intends to find the significant relationships and differences between digital trust level and demographic profile, employment profile, technology integration, and technographic social profile. It is hoped that this paper will contribute additional knowledge about digital trust in academic workplaces.

2. RESEARCH METHODS

This paper is part of a global study on Digital Trust in the Workplace [6]. The study administered an online survey in 36 countries in Africa, Asia, Europe, North America, Oceania, and South America, in 2019. There was a random selection of countries that were to be included grounded on linkages, networks, and partnerships. The survey questionnaire utilized was the Marcial and Launer Survey e-Trust [15], which was translated into 14 languages (German, Spanish, Portuguese, French, Polish, Romanian, Slovenian, Russian, Traditional Chinese, Simplified Chinese, Thai, Vietnamese, Japanese, and Korean), and was accessed through the website of Ostfalia University of Applied Sciences. Snowball sampling was utilized in the selection of respondents. It gathered a total of 5,621 respondents. In this paper, only those from the education sector were included in the analysis, with responses having incomplete data entry removed. Thus, a total number of 878 were included in this paper.

A 4-point Likert scale or the forced Likert scale was used, with 1 equating to not trusted at all; 2, low; 3, moderate; 4, highly trusted. The following statistical tools were utilized in this paper: overall mean to determine the trust levels in technology in terms of electronic devices, hardware and software systems, information systems, and level of trust in people with access to digital technology; mean of means to determine the information technology and people trust level; chi-square test to determine significant relationships; and one-way analysis of variance (ANOVA) to determine significant differences.

3. THE RESULTS AND DISCUSSION

The results and discussion commence with the display of the measurement of the level of trust in information technology in terms of electronic devices, hardware and software systems, information systems, and people with access to digital technology. Further, there is the display and discussion of significant relationships and differences between the respondents' digital trust and socio-demographics, employment, and technologic profiles.

3.1. Level of digital trust

Tables 1 to 5 present the results of the trust levels of academic respondents in terms of electronic devices provided, hardware and software systems installed, information systems, and people with access to digital technology.

3.1.1. Level of trust in Personal Computers

One of the popular categories of computers is the personal computer [16]. Some of the types of personal computers include laptops, tablets, desktops, and servers. In today's generation of computers, wearable computers are widely used. These types of electronic devices are common in many academic institutions.

Table 1 shows the mean trust level in electronic devices among respondents in academic workplaces. Of all the devices provided, the laptop has the highest trust level mean of 3.28, while watches have the lowest mean of 2.50. Overall, the level of trust in electronic devices among the academe is moderate at 2.85. This implies that employees have high confidence in using their laptops compared to other devices. In contrast, studies [17] [18] showed that more users are concerned with their privacy on mobile phones compared to laptops. Notably, the "trustworthiness of the system also depends on the hardware" [19]. "Trusted infrastructure must be based in trusted hardware" [20]. In addition, security and privacy implications of user behaviors and perceptions are requisite in improving the device's security [17].

Table 1

| Electronic Devices either for official or personal use | Mean | Description |
|--|------|-------------|
| Laptop | 3.28 | high |
| Tablet | 2.87 | moderate |
| Other wearables | 2.76 | moderate |
| Watch | 2.50 | low |
| Aggregate Mean | 2.85 | moderate |

Trust level in electronic devices

3.1.2. Level of trust in software systems

"A software is organized for a common purpose, that tells the computer what task(s) to perform and how to perform them" [3]. Software is a computer program, and it has two

categories. These are system software and application software. System software is deviceoriented, like operating systems and other utility programs. In contrast, application software is user-oriented, like office productivity systems (word processing), e-learning tools (learning management system), embedded systems (CCTV), information systems (payroll systems), among others. Many schools have initiated smart library and campus technology for a competitive edge, which incorporates basic, complex, and advanced information and communication technology [21].

Table 2 shows the mean trust level for software systems installed. The hardware and software systems ranged in trust levels between 2.86 and 3.03, with an average of 2.99. Email Tracking and Monitoring System and ID System in daily time recording in institutions, universities, and schools garnered the highest trust level mean of 3.03, while ID system in cafeteria has the lowest trust level mean of 2.86. Overall, the trust level of the respondents in hardware and software systems is moderate. The result may imply that hardware and infrastructure applications have design processes that can reduce the risk of cybersecurity breaches [22], leading to trust in the software.

Table 2

| Software Systems Installed (either for personal or official transactions) | Mean | Description |
|---|------|-------------|
| ID System of doors, gates, and other entrance and exit in the company or organization | 3.02 | moderate |
| Workflow management (e.g., Groupware systems) | 3.01 | moderate |
| Email Tracking and Monitoring System | 3.03 | moderate |
| ID System in Daily Time Recording | 3.03 | moderate |
| ID System in Printing and Duplication Services | 3.00 | moderate |
| Video Surveillance (CCTV) | 2.99 | moderate |
| ID System in Cafeteria | 2.86 | moderate |
| Aggregate Mean | 2.99 | moderate |

Trust level in software systems

4.1.3. Level of trust in Information Systems

Information systems are a group of unified processes and activities to capture, process, communicate, and convert data to information to support decision-making [23]. Information systems generally fall into one of five categories. These are office information systems, transaction processing systems, management information systems, decision support systems, and expert systems [3].

Table 3 shows the mean trust level for information systems implemented in the academic workplace. The information systems ranged in trust level between 2.72 and 3.09 with an average of 2.93. Payroll systems got the highest trust level mean of 3.09, and Internet bots had the lowest trust level mean of 2.72. Overall, the trust level of the respondents in implemented information systems is moderate. The results denote that these systems have roots of trust, which are parts of the system that must be trusted and must enable, at a minimum, the ability to verify the trustworthiness of the rest of the system [24].

Similarly, the results connote a conservative trust and reliability in the software engineering practices of these systems, especially during requirements generation and software architecture. It can be noted that "embedded devices generally lack hardware trust root and cannot use trusted computing technology to guarantee their operating environment" [25]. Trust in the management of information systems is an experienced state that emphasizes the willingness to depend on the system [26]. User trust in the software also depends on transparency and communications about the software lifecycle process. System availability, reliability, data integrity [27], workforce empowerment, and a fast turnaround cycle [27] are among the many considerations in ensuring dependability of academic systems. If the software

development procedures and the policies applied while creating the software are not easily understood, the user's trust in the resulting technology will be undermined [19].

Table 3

| Information Systems that are implemented (regardless of usage) | Mean | Description |
|--|------|-------------|
| Payroll systems | 3.09 | moderate |
| Computer Supported Co-operative work / Collaboration tools | 3.07 | moderate |
| Spreadsheet Models | 3.00 | moderate |
| Executive Information Systems | 3.00 | moderate |
| Personnel (HRM) systems | 2.97 | moderate |
| Management Reporting Systems | 2.96 | moderate |
| Financial Planning systems | 2.93 | moderate |
| Logistics systems | 2.92 | moderate |
| Group Decision Support Systems | 2.88 | moderate |
| Reservation systems | 2.89 | moderate |
| Sales management systems | 2.89 | moderate |
| Budgeting systems | 2.93 | moderate |
| Inventory control systems | 2.87 | moderate |
| Stock control systems | 2.89 | moderate |
| Internet bots (also known as web robots, WWW robots or bots) | 2.72 | moderate |
| Aggregate Mean | 2.99 | moderate |

Trust level in information systems

3.1.4. Level of trust in people with access to digital technology

People component or the users are known to be the primary element in any digital technology. People as part of the digital system come in the form of information technology and network specialists, computer engineers, system developers, website designers, as well as company employees who are the majority end-users of the computer system [7]. The strategic leadership and managerial team also play a critical role in managing a digital system [28], [29]. It is imperative that protecting users and the entire people component is just as important as protecting hardware and software [3].

Table 4 shows the mean trust level of the respondents in people with access to digital technology in terms of management and other internal entities, IT and data support, and external entities. Trust levels range between 2.66 and 3.06 with an average of 2.92. The Information Systems Supervisory Team (e.g., Manager, Head, Director) got the highest trust level mean of 3.06 and Journalists of online newspapers have the lowest trust level mean of 2.66. All in all, the trust level of the respondents in People with Access to Digital Technology is moderate. Notably, most IT and security administrators are professional, honest, trustworthy, and perform actions true to their role [30].

Trust is one of the many facilitating factors for a successful employee-manager relationship. "When the sense of trust is strong between an employee and manager, it adds efficiency to other elements of workplace productivity" [31]. Notably, interpersonal trust within the organization is affected by the trust between the management and workers and trust in the organization's decisions.

Table 4

| ' | rust | level | in | people | with | access | to | digital | technol | logy |
|---|------|-------|----|--------|------|--------|----|---------|---------|------|
| | | | | | | | | | | |

| Management & Other Internal Entities | Mean | Description |
|---|------|-------------|
| Top Management (CEO, President, Board Members, Vice Presidents) | 3.03 | moderate |
| Middle Management (Department Heads, Branch Managers) | 3.02 | moderate |
| First Level Management (Supervisors, Foreman, Office Managers) | 3.01 | moderate |
| Contributors (Salesmen, Clerical, Secretarial, Technical Employees) | 2.91 | moderate |
| Co-workers at the Strategic Business Unit | 3.01 | moderate |

| Co-workers at the Research and Development Unit | 3.04 | moderate |
|---|------|-------------|
| IT & Data Support | Mean | Description |
| Personal information processor | 2.97 | moderate |
| Computer Systems Development Team (e.g. Analyst, Designer, Programmer, Tester, Trainer) | 3.03 | moderate |
| Information Systems Supervisory Team (e.g., Manager, Head, Director) | 3.06 | moderate |
| IT Librarian | 2.98 | moderate |
| Data Encoder | 2.91 | moderate |
| External Entities | Mean | Description |
| Customers or clients | 2.93 | moderate |
| Logistics service provider / service provider (consulting / accounting / IT / taxes) | 2.83 | moderate |
| Retailer (with a stationary shop) | 2.84 | moderate |
| Dealer or wholesaler (online trade or platform trade) | 2.83 | moderate |
| Manufacturers | 2.86 | moderate |
| Suppliers | 2.88 | moderate |
| Government / Public Service / Schools / Universities | 2.85 | moderate |
| Non-government agencies | 2.81 | moderate |
| Journalists of online newspapers | 2.66 | moderate |
| Overall mean | 2.92 | moderate |

3.1.5. Summary of digital trust Level

Table 5 displays the measurement of the level of trust in information technology and people in academic workplaces. The mean trust levels of the three information technology components considered ranged between 2.85 and 2.93, while that of people with access to digital technology is 2.92. Overall, the respondents have moderate trust in information technology and people in their workplaces with a mean of means of 2.92. "Understanding can guide the design of solutions that will help users safely benefit from the potential and convenience offered by mobile platforms" [17].

Table 5

| Computer System | Mean | Description |
|--|------|-------------|
| Electronic Devices | 2.85 | moderate |
| Software Systems | 2.99 | moderate |
| Information Systems that are implemented | 2.93 | moderate |
| People with Access to Digital Technology | 2.92 | moderate |
| Mean of means | 2.92 | moderate |

Summary of Digital Trust Level in the Academe

3.2. Test of relationships and differences of information technology and people trust level

Tables 6 and 7 display the results of the test of relationships and differences, respectively, between the level of IT and people trust and the respondents' socio-demographic, employment, and technologic profiles.

3.2.1. Test of relationships between digital trust level and various profiles of the respondents

Table 6 presents the results of the analysis made so as to determine whether or not a significant relationship exists between each of the components included in the respondents' profile and their level of digital trust. All components are significantly related to the level of

digital trust. This shows that social demographics, employment profiles, and the respondents' technologic profile affect the level of digital trust in the academic workplace.

Table 6

| Socio-demographic profile | χ^2 | <i>p</i> -value | df | Remarks |
|-----------------------------|----------|-----------------|----|-------------|
| Age | 79.499 | 0.000 | 10 | significant |
| Gender | 144.227 | 0.000 | 6 | significant |
| Status | 29.493 | 0.000 | 6 | significant |
| Educational attainment | 81.472 | 0.000 | 21 | significant |
| Continent | 58.521 | 0.000 | 15 | significant |
| Country income level | 71.391 | 0.000 | 3 | significant |
| Employment profile | χ^2 | <i>p</i> -value | df | Remarks |
| No. of years of employment | 40.718 | 0.000 | 6 | significant |
| Employment status | 13.909 | 0.003 | 3 | significant |
| Job position | 73.151 | 0.000 | 12 | significant |
| Company Type | 65.321 | 0.000 | 8 | significant |
| Company Form | 138.664 | 0.000 | 3 | significant |
| Company Size | 180.216 | 0.000 | 8 | significant |
| Technologic Profile | χ^2 | <i>p</i> -value | df | Remarks |
| Social Technographic Ladder | 107.829 | 0.000 | 12 | significant |
| Connectivity Satisfaction | 58.917 | 0.000 | 8 | significant |

Test of Relationships between the profiles and Digital Trust level

Further, a multiple regression was calculated to predict the level of digital trust on all profiles of the respondents (see Table 7). A significant regression equation was found (F (14), 841) = 9.551, p < .000), with an R² of 0.137. Gender, income level, and connectivity satisfaction were significant predictors of the level of digital trust in the academic sector. Data shows that the female respondents have better digital trust level ($\underline{x} = 2.93$) compared to LGBT-Q ($\underline{x} = 2.85$) and male ($\underline{x} = 2.84$) respondents. Respondents from low income countries have higher level of digital trust ($\underline{x} = 3.06$) than those coming from lower-middle-income ($\underline{x} = 2.80$), uppermiddle-income ($\underline{x} = 2.66$), and high income ($\underline{x} = 2.62$) countries. In terms of internet satisfaction, the respondents who are extremely satisfied ($\underline{x} = 3.00$) have better digital trust than those respondents who are moderately satisfied ($\underline{x} = 2.86$), slightly satisfied ($\underline{x} = 2.63$), and not satisfied ($\underline{x} = 2.60$). While they differ in terms of weighted mean when grouped according to gender, income level, and internet satisfaction, data shows that they have a moderate level of digital trust.

Table 7

| Regression Statistics | | | | | |
|-----------------------|-------|---------|-------|-------|--------------|
| Multiple R | 0.370 | | | | |
| R Square | 0.137 | | | | |
| Adjusted R Square | 0.123 | | | | |
| Standard Error | 0.514 | | | | |
| Observations | 856 | | | | |
| | | | | | |
| ANOVA | | | | | |
| | | | | | Significance |
| | df | SS | MS | F | F |
| Regression | 14 | 35.377 | 2.527 | 9.551 | 0.000 |
| Residual | 841 | 222.506 | 0.265 | | |
| Total | 855 | 257.883 | | | |

Multiple Regression between Digital Trust Level and Profiles

| | Coefficient s | Standar d Error | t Stat | P- value | Lower 95% | Upper 95% | Lower 95.0% | Upper 95.0% |
|---------------------------|------------------|--------------------|--------|-------------|-----------|--------------|----------------|----------------|
| | | | 15.61 | | | | | |
| Intercept | 3.077 | 0.197 | 6 | 0.000 | 2.690 | 3.464 | 2.690 | 3.464 |
| Age | -0.001 | 0.021 | -0.060 | 0.953 | -0.043 | 0.041 | -0.043 | 0.041 |
| Gender | -0.056 | 0.020 | -2.857 | 0.004 | -0.095 | -0.018 | -0.095 | -0.018 |
| Status | 0.019 | 0.032 | 0.599 | 0.549 | -0.044 | 0.082 | -0.044 | 0.082 |
| Educational Attainment | -0.004 | 0.017 | -0.238 | 0.812 | -0.037 | 0.029 | -0.037 | 0.029 |
| Continent | -0.036 | 0.019 | -1.872 | 0.062 | -0.073 | 0.002 | -0.073 | 0.002 |
| Income Level | -0.155 | 0.030 | -5.121 | 0.000 | -0.215 | -0.096 | -0.215 | -0.096 |
| No. of Year of Employment | 0.008 | 0.018 | 0.468 | 0.640 | -0.027 | 0.043 | -0.027 | 0.043 |
| Employment Status | -0.013 | 0.064 | -0.197 | 0.844 | -0.138 | 0.113 | -0.138 | 0.113 |
| Job position | -0.007 | 0.018 | -0.391 | 0.696 | -0.043 | 0.028 | -0.043 | 0.028 |
| Company type | -0.006 | 0.022 | -0.271 | 0.786 | -0.049 | 0.037 | -0.049 | 0.037 |
| Company Form | -0.031 | 0.043 | -0.706 | 0.480 | -0.116 | 0.055 | -0.116 | 0.055 |
| Company size | 0.003 | 0.020 | 0.132 | 0.895 | -0.037 | 0.043 | -0.037 | 0.043 |
| Social Technologic Ladder | -0.015 | 0.009 | -1.661 | 0.097 | -0.033 | 0.003 | -0.033 | 0.003 |
| Connectivity Satisfaction | 0.121 | 0.026 | 4.650 | 0.000 | 0.070 | 0.172 | 0.070 | 0.172 |

3.2.2. Test of differences of digital trust level among various groups of respondents

Delineated in Table 8 is the result of the one-way ANOVA in determining whether or not the respondents' level of digital trust across the different groups significantly differs. As can be seen in the table, all components significantly differ. This result is manifested in their *p*-value, which is less than the margin of error at 0.05. This shows that even if respondents have a moderate level of digital trust, their levels of trust within the moderate range vary in intensity.

Table 8

| Socio-demographic profile | F | <i>p</i> -value | Remarks |
|-----------------------------|----------|-----------------|-------------|
| Age | 284.2658 | 0.000 | significant |
| Gender | 1003.35 | 0.000 | significant |
| Status | 2542.424 | 0.000 | significant |
| Educational attainment | 3.896045 | 0.049 | significant |
| Continent | 39.45325 | 0.000 | significant |
| Country income level | 1302.887 | 0.000 | significant |
| Employment profile | F | <i>p</i> -value | Remarks |
| No. of years of employment | 54.35272 | 0.000 | significant |
| Employment status | 8975.335 | 0.000 | significant |
| Job position | 32.32841 | 0.000 | significant |
| Company Type | 1229.117 | 0.000 | significant |
| Company Form | 3031.003 | 0.000 | significant |
| Company Size | 433.73 | 2.94927E-86 | significant |
| Technologic Profile | F | <i>p</i> -value | Remarks |
| Social Technographic Ladder | 145.4029 | 3.17468E-32 | significant |
| Connectivity Satisfaction | 96.06989 | 4.06985E-22 | significant |

Test of Differences between Profiles and Digital Trust level

4. CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH

There is reasonable digital trust in terms of hardware, software, and people in academic institutions. Teachers and non-teaching personnel have an adequate level of confidence to trust

electronic devices, hardware and software, information systems, and people who have access to digital technology in the academic working environment. Building trust, especially in the educational sector, is a process of establishing an ecosystem of people, software, and hardware working together with trustworthiness [32].

The results are the benchmark for the following recommendations. To achieve trustworthiness of computer systems, formal verification, quality prediction and certification, complemented by fault handling and tolerance for increased robustness must be carefully implemented in schools [33]. There is a need for IT departments and similar offices to orient, guide, and train the employees on the use of electronic devices for them to be familiar and confident in the use of such technology. Due to the reasonable and adequate level of trust in the academe, school administrators need to exert more effort to augment the trust levels among their employees.

In addition, there is a need to conduct further studies to improve the understanding of digital trust in the workplace. These studies are expected to research a) if digital trust affects technology acceptance and skills acquisition, b) if teaching rank, e.g., professor, researcher, affects the trust level of academic respondents, among others. It is also recommended to expand the measurement of digital trust among other academic stakeholders such as students and parents. Similarly, measuring trust levels for other forms of hardware devices and software systems is also recommended. Moreover, a comprehensive study should be conducted measuring digital trust in terms of user data and actual procedures accessed in a computer system.

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ЦИФРОВА ДОВІРА ДО УНІВЕРСИТЕТУ: ЛЮДИ, ПРОГРАМНЕ ЗАБЕЗПЕЧЕННЯ ТА ОБЛАДНАННЯ

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Анотація. Інформаційні технології відіграють важливу роль в адмініструванні та управлінні освітнім процесом. З огляду на те, що інформаційні технології є невід'ємною частиною формування довіри на робочому місці, у роботі дано визначення цифрової довіри в навчальних закладах. Зокрема в статті представлено вимірювання рівня цифрової довіри до апаратних засобів, програмного забезпечення та людей у навчальних закладах. Крім цього показано зв'язки та відмінності між цифровою довірою та соціально-демографічними, трудовими та технологічними профілями респондентів. Для дослідження, у якому взяли участь 878 респондентів з різних академічних установ, була використана та проаналізована анкета онлайн опитування щодо довіри на робочому місці з використанням Marcial-Launer Digital Trust. Для вимірювання рівня довіри використовували 4-бальну примусову шкалу Лайкерта та середнє зважене. Для визначення суттєвих зв'язків і відмінностей були використані хі-квадрат і односторонній ANOVA. Для прогнозування рівня цифрової довіри відповідно профілів респондентів була розрахована множинна регресія. Результати ілюструють середній рівень довіри до електронних пристроїв, апаратних і програмних систем, інформаційних систем і людей, які мають доступ до технологій на робочих місцях у навчальних закладах із середнім показником 2.92. Результати також демонструють, що соціально-демографічні профілі, профілі зайнятості та технологічні профілі виявились суттєво пов'язаними, водночас маючи відмінності в рівні цифрової довіри. Стать, рівень доходу та задоволеність зв'язком були суттєвими провісниками рівня цифрової довіри в академічному секторі. Отже, зроблено висновок, що в академічних установах існує обгрунтована довіра до інформаційних технологій, включаючи технічне обладнання, програмне забезпечення та людський ресурс. Викладачі та непедагогічні працівники мають достатню довіру до електронних пристроїв, апаратного та програмного забезпечення, інформаційних систем і людей, які мають доступ до цифрових технологій в академічному робочому середовищі. Рекомендовано приділяти більше уваги ІТ-відділам та подібним відділенням, спрямовувати та навчати співробітників впевнено використовувати електронні пристрої, інші інформаційні технології. Адміністратори шкіл повинні докладати більше зусиль, щоб підвищити рівень цифрової довіри серед своїх співробітників.

Ключові слова: академічне робоче місце; комп'ютерна система; цифрова довіра; управління ІКТ; інформаційні технології в освіті.

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