DIGITAL LEARNING IN TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING (TVET) IN THE FEDERAL POLYTECHNIC ILARO, OGUN STATE, NIGERIA

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Abstract

Digital learning can finally help students in the teaching and learning process. TVET face-to-face teaching is more practical than online teaching. This study therefore investigated the perceptions of lecturers on digital learning and Technical Vocational Education and Training (TVET) at the Federal Polytechnic, Ilaro. Out of the 362 total population of the academic staff at the Federal Polytechnic of Ilaro, Taro Yamane formula was used select a sample size of 190. The instrument used in this study was questionnaire that was administered to the randomly selected lecturers. The data gathered was analysed using the Statistical Package for Social Science (SPSS) version 26.0. Descriptive statistical analysis was performed in the form frequency and percentages. A total of 185 out of 190 sample size lecturers answered the questionnaire. The questionnaire consists of the questions relating to the study. The findings revealed that digital learning and TVET is perceived by lecturers as a conducive way to facilitate interactions and discussions between lecturers and learners, is convenient to use, facilitates and improves teaching and learning, and is user friendly. The study recommends that; institutional needs, instructor's needs and learner's needs be evaluated prior to the implementation of digital learning. It is also recommended that sufficient training be provided to all users prior to the full adoption of digital technology and that there is provision of complete infrastructure, including software and hardware, full access to the internet, IT manuals and reading and training materials as key requirements to achieve effective implementation of digital learning.

Keywords: *Digital learning, Technical and Vocational Education and Training, technology and education, online learning*

Introduction

Globally, there is a paradigm shift from the traditional approach of teacher-centred learning to modern methods where ICT plays a significant role. The emergence of digital technology has brought with it changes in the process of imparting and acquiring knowledge in various sectors.

The development of digital technology today has opened space for the world of education to use digital technology in the teaching, research and learning process. Digital learning is no longer foreign but its use in education is increasing and widespread with TVET inclusive (Amin & Sundari, 2020; Islam Sarker et al., 2019) especially at the tertiary level (Bond et al., 2018; Ødegaard et al., 2021).

According to Abdul Bujang et al. (2020), digital learning is any educational activity using technology to improve students' understanding. Kumar Basak et al. (2018) refers to digital learning as using knowledge and communication technology through open and distance learning.

Digitalisation should not be considered e-learning because online teaching and learning are just digital changes in higher education (Adedoyin & Soykan, 2020). In general, digital learning is a teaching and learning process that uses technological mediums such as video, e-learning, web-based, augmented reality, and virtual reality. It helps increase

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students' understanding and is more affordable, exciting and according to their needs and learning styles. Digital learning is a platform for the teaching and learning process according to the suitability of time and place while improving student learning quality (Cojocariu et al., 2014; Kumar & Sharma, 2021; Zwart et al., 2017).

In addition to the impact of technological developments, digital learning has helped lecturers in universities to deliver learning more effectively, this shows that digital learning is essential in education, including technical and vocational education and training (TVET).

Advances in science and technology have changed the global economic landscape, where rapid industrial development needs to be trained human resources to meet the job market (Aldossari, 2020). ICT has a great speed of providing flexibility, improvement in quality and quantity of learning instead of total dependence on textbooks and materials in prints as teaching and learning in the technical education has done in the past. The advantages of using the e-learning technology as an educational tool ranges from capacity of students to personally learn needed skills and information almost in any field imaginable which TVE is inclusive.

According to UNESCO-UNEVOC (2021), TVET encompasses education and training and skills development in various fields of employment and is lifelong learning which is available at the secondary, post-secondary and higher education

levels. Therefore, TVET can produce a competent workforce based on recognized employment standards, emphasizing practical components, psychomotor skills, and exposure to training in the industry. However, there are challenges which need to be addressed by lecturers, especially in the context of TVET. Among them is thrown by Adarkwah (2021), Blundell et al. (2016), and Aina and Ogegbo (2022) where they echoed that there are only few research to form a proper conceptual framework in online learning for researchers and instructors. the new economy and human capital is its fuel. This study therefore determines the perceptions of TVET lecturers on the use of Digital learning; as well as assess the readiness and willingness of TVET lecturers to apply digital learning in technical and vocational education and training (TVET) in the Federal Polytechnic Ilaro, Ogun State, Nigeria.

There are many terms used to describe learning that is delivered online, via the internet, ranging from distance education, to computerized electronic learning, online learning, internet learning and many others. Digital learning is learning utilizing electronic technologies to access educational curriculum outside of the traditional classroom. It is not confined to online learning but it includes computer-based learning, web-based learning, virtual classrooms and digital collaboration. In most cases, it refers to a course, programme or degree delivered completely online.

Carrier, Ryan, Damerow and Bailey (2007) depicted DL as the employment of technology to the learning and teaching development. Hayes (2017) contended that DL may be portrayed as learning that is encouraged by computerised advancements. Nonetheless, to examine DL only along these lines undermines the imperative intricacies connected to dialect, culture, legislative issues and the economy. Hayes and Jandric (2014) warned that this underestimate or decreases the superb role of human contribution in the scholarly world and beyond, adding that DL must contribute to economic improvements such as educational performance and proficiency. On the other hand,

Alliance for Excellent Education (2016) as cited in Carrier (2017) portrayed DL as an educational practice that maximises the employment of technology in order to empower students' learning experience and educational journey. DL comprises a wide range of solutions or tools, as well as applications to equip and empower lecturers, including online courses, blended or hybrid learning, digital content and resources. Davies, Mullan and Felman (2017, 6) maintain that DL can improve the efficiency of running an education programme.

Okoye, Otuka and Ihoenunekwu (2010) see digital learning as all forms of electronically supported teaching and learning which are procedural in character and aimed to affect the construction of knowledge with reference to individual experience, practice and knowledge to the learner.

Digital learning which has to do with ICT tools and internet facilities can make teaching, especially in TVET more efficient and productive by engendering a variety of tools to enhance and facilitate teachers' professional activities through the effective use of internet, intranet, video tape, power point, overhead projectors, interactive boards and a host of others. In the same vein Chinwendu (2015) opined that digital learning is all about learning that occurs at the computer or any technological tool. According to him, the convergence of the internet and learning, or internet-enabled learning is called digital learning.

The uses of network technologies to create, foster, deliver and facilitate learning, anytime and anywhere. It is also the delivery of individualized, comprehensive, dynamic learning content in real time, aiding the development of communities of learning, linking learners and practitioners with experts. Oluwalola and Awodiji, (2019) defines digital learning as an innovative approach for delivery electronically mediated, well designed, learner centred and interactive learning environments to anyone, anyplace, anytime by utilizing the internet and digital technologies in the instructional design principles. It is concerned with learning through any electronic medium that may or may not be connected to the internet.

The Technology Acceptance Model (TAM) (Davis 1989), shaped the theoretical base of the study. TAM and the Unified Theory of Acceptance and Utilization of Technology (UTAUT) (Venkatesh et al. 2003) have been broadly described to be successful in foreseeing acknowledgment among users in the academic space. Hence this theory is relevant in the context of this study. TAM was Davis's idea (1989), his frame of reference was derived from a burning desire to explicate the user's comprehension of Technology Acceptance. The TAM authentic technology utilisation is decided by one's behavioural expectation to utilize a chosen technology. Behavioural expectation is influenced by one's point of view towards the utilisation of technology, and by the immediate and indirect impacts of perceived usefulness and ease of use. Perceived ease of use and perceived usefulness mutually influence the usage point of view, perceived ease of use on the other hand has an unswerving influence on perceived usefulness (Davis 1989).

Having explored the abovementioned and five different models of technology adoption, Venkatesh et al. (2003) tabled the UTAUT model to explicate users' intent to utilize technology and resulting usage conduct or behaviour. UTAUT model is dependent on four essential constructs viz. (Performance expectancy, effort expectancy, social

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influence, and facilitating conditions) to envision the usage intent and behaviour or conduct. Taking into account the evidence drawn from investigations that utilized the above theories and models. Teo (2010) built up a model delineating technology acceptance as a multidimensional construct containing five elements, viz: perceived usefulness; perceived ease of use; attitude towards technology as well as exterior variables viz: subjective norm; and facilitating conditions.

Methodology

The study uses a survey research design technique for data collection to examine the digital learning empirically and systematically on TVET in the Federal Polytechnic of Ilaro,Ogun State. The study adopted a mixed method research methodology to investigate the phenomenon. The study was conducted among the lecturers at the Federal Polytechnic, Ilaro, Ogun State. Simple random sampling methods was employed to choose the participants for the study. The instrument used in this study is questionnaire which was validated with Cronbach's Alpha.

The population of the study comprise of 362 academic staff of the Federal Polytechnic, Ilaro, Ogun State. Using Taro Yamane (1967) formular, a sample size of 190 respondents were chosen for the study. The study used both primary and secondary source of data. The primary data was sourced through administration of questionnaire to sampled respondents and secondary sources through articles in journals, textbook, institutional report and other internet sourced materials. This questionnaire adopts the use of 5-point Likert scale with possible responses of "1 = Strongly disagree", "2 = Disagree", "3 = Neither agree nor disagree", "4 = Agree", "5 = Strongly agree". The Likert scale has the reliability that refers to the consistency of test results, i.e., a level obtained by a person represents their level of use in the test (Konting, 2004). A total of 190 questionnaires were administered to lecturers in the Federal Polytechnic of Ilaro, and 185 questionnaires were returned answered completely. Data collected were analysed using descriptive statistics using the Statistical Package for Social Science (SPSS) version 26.0. Descriptive statistical analysis was performed in the form of frequency and percentage scores.

Data Analysis and Discussions

This section contains the findings of the study, including tables in a concise way according to the questionnaire.

Table 1: Academic Staff perceptions Digital learning and TVET in the Federal Polytechnic Ilaro, Ogun State.

S/N	Variables	SA	A	U	D	SD
1	Digital learning is a system the provide a platform for direction	79 (42.7%)	54 (29.2%)	7 (3.8%)	26 (14.0%)	19 (10.3)
2	Digital learning is a technological innovation that improves TVET teaching in FPI	90 (48.6%)	60 (32.4%)	15 (18.1%)	9 (4.9%)	11 (6.0%)

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3	Digital learning is a technological innovation that enhances lecturer's professional status and prestige	74 (40.0%)	51 (27.6%)	10 (5.4%)	26 (14.0%)	24 (13.0%)
4	Digital Learning is user friendly	80 (43.2%)	45 (24.3%)	15 (8.1%)	25 (13.5%)	20 (10.9%)
5	Digital Learning helps lecturers to upload students results and grades in FPI	78 (42.2%)	61 (33.0%)	8 (4.3%)	27 (14.6%)	11 (6.0%)
6	The integration of digital learning in FPI is useful to students and lecturers in several ways	71 (38.4%)	64 (34.6%)	10 (5.4%)	26 (14.0%)	14 (7.6%)
7	Digital learning is helpful in downloading quizzes and assignments	75 (40.5%)	66 (35.7%)	9 (4.9%)	20 (10.9%)	15 (8.1%)
8	Digital learning affords students flexibility in learning	83 (44.9%)	55 (29.7%)	7 (3.8%)	25 (13.5%)	15 (8.1%)
9	Digital learning in FPI helps lecturers to formulate different learning activities based on different learning theories	87 (47.0%)	63 (34.1%)	10 (5.4%)	15 (8.1%)	10 (5.4%)
10	Digital learning system is useful in uploading lecture notes	71 (38.4%)	55 (29.7%)	13 (7.0%)	26 (14.0%)	20 (10.9%)

Source: Field Survey, 2023

As shown in table 1, 71.9 per cent (42.7+29.2) of the respondents perceived digital learning is a system the provide a platform for direction that improves teaching in TVET Federal Polytechnic, Ilaro, 3.8 per cent were undecided, and 24.3 per cent disagreed. The results of the study in question 2 revealed that 81.0 per cent (48.6+32.4) of the respondents perceived digital learning is a technological innovation that improves TVET teaching in FPI, 18.1 per cent were undecided, and the remaining 10.9 per cent disagreed. In question 3, 67.6 per cent (40.0+27.6) of the respondents perceived digital learning is a technological innovation that enhances lecturer's professional status and prestige 5.4 per cent were undecided, and 27.0 per cent disagreed. Furthermore, in question 4, the results of the study showed that the majority of the respondents 67.5 per cent (43.2+24.3) agreed that digital learning is user friendly, 8.1 per cent were undecided and the remaining 24.4 per cent disagreed. The results of the study further in question 5 showed that 75.2 per cent (42.2+33.0) of the respondents perceived that digital learning helps lecturers to upload students results and grades in FPI, 4.3 per cent were neutral, while the remaining 20.6 per cent disagreed. Results in

question 6 showed that 70.0 per cent (38.4+34.6) of the respondents perceived that the integration of digital learning in FPI is useful to students and lecturers in several ways, 5.4 per cent were undecided, and the remaining

Per cent Disagreed.

The findings also suggested in question 7 that 76.2 per cent (40.5+35.7) of the respondents perceived that digital learning is helpful in downloading quizzes and assignments, 4.9 per cent were undecided and the remainder (19.0%) disagreed. In question 8, the results indicated that 74.6 per cent (44.9+29.7) of the respondents perceived digital learning affords students flexibility in learning, 3.8 per cent indicated they were undecided and the remainder (21.6%) disagreed. The study also revealed in question 9 that 81.1 per cent (47.0+34.1) of the respondents perceived that digital learning in FPI helps lecturers to formulate different learning activities based on different learning theories, 5.4 per cent were undecided and 13.5 per cent disagreed. Lastly, the results of the study in question 10) showed that 68.1 per cent (38.4+29.7) perceived digital learning system is useful in uploading lecture notes, 7.0 per cent were undecided and the remaining 24.9 per cent disagreed.

The findings of the study revealed that TVET lecturers that digital learning facilitates discussions and interactions between lecturers and students, it also ensure easy learning in tertiary institutions,it is convenient to use, and improves teaching, and it is user friendly. This is in accordance to the study of Jethro, Grace and Thomas (2012) that also found that digital learning promotes an entirely new learning environment for students, as well as offers students the control over content, pace of learning, time, and learning sequence, thereby allowing them to tailor their experiences to meet their personal learning objectives.

Conclusion and Recommendations

The study concludes that the application of digital learning allows for both face-to-face mediated teaching and learning courses which may be delivered by blended learning; offers lecturers and students options in the where, when, how, for how long and by what means of study, according to their needs and circumstances; and leads to the use of open educational resources (OER) and open courseware (OCW). The findings also suggested that digital learning provides a convenient means of storing, managing, reusing and curating digital materials for the purpose of education, research and administration. In addition to this, it promotes virtual reality (VR) which enables learning from accurate and realistic 3D models of machines, equipment, planetary systems and other phenomena in safe, more convenient and better controlled environments. Furthermore, it gives exceptional visualisation that cannot be easily achieved in a traditional classroom.

Based on the findings of the study above, the study therefore recommends that:

1. There should be early introduction of ICT through the e-teaching and e-learning to students in the first stages of education to enable them have access to the computer early in life like their counterparts in the developed world.

2. There should be adequate provision of infrastructure that supports ICT e.g. electricity supply should be of top priority. If possible, a standby generator set should be provided to cater for frequent power shortage.

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3. All classrooms, halls and workshops in TVET institutions should be connected to the internet in order to enhance web-based instruction. The government should do this by paying internet connection fees in the schools.

4. The government of Nigeria should embark on a massive computer literacy training programmed nation-wide particularly for teachers and learners at all levels. This should be accomplished through in-service training of teachers, workshops, seminars and conferences. For students, computer education should be a compulsory subject at all levels and the introduction of e-teaching and e-learning be encouraged in TVET institutions.

5. Videophone, teleconferencing and multimedia systems e.g. multimedia computers and multimedia projectors should be provided in adequate quantities by the government for effective e-learning in the TVET institutions.

References

Abdulkadir, M.,&Ma'aji, S. A. (2014). Assessment of workshop facilities Management practices in Technical Colleges of Niger State. *International Journal of Scientific Research Publication, 4*(7), 1-7. Retrieved from, http://www.ijsrp.org.

Adeoye, E. (2013). *Introduction to internet fundamentals*: An electronic learning approach. Available at: http://ideamingle.net

Adomi, E. E. &Kpangban, E. (2010). Application of ICT in Nigerian secondary schools. *E-journal of library philosophy and practice*. University of Nebraska, Lincoln. Retrieved from, http://www.digitalcommons.un/edu/lipphiprac/345

Agbamuche, S. C. (2015). The use of instructional media in Nigerian educational system: principles, practice, problems and prescriptions. *Journal of research on Technology in Education, 1*(46), 35-41.

Agbo, B. C. D., Onaga, P. O. &Omeje, H. O. (2O18). Teacher's opinion on availability of e-learning opportunities for effective technical and vocational education and training (TVET) in tertiary institutions in South East Nigeria. *International Journal of Vocational and Technical Education, 10*(1), 1-6. Retrieved from http://www.academicjournals.org/IJVTE

Association for the Advancement of Computing in Education (AACE).

Babafemi, M. A. (2017). Information and communication technology (ICT) in technical education. *SCIREA Journal of Education, 1*(1), 79-87. Retrieved from http://www.scirea.org/journal/education

Ben, C. &Ashang, M. (2013). The role of ICT in the skill manpower development through vocational technical education among higher institutions in Cross Rivers State Nigeria. *International Journal of Vocational and Technical Education, 5*(5), 92-99.

Bizcommunity. 2014. One laptop per child launches first project in SA – Bizcommunity.com. https://www.bizcommunity.com/Article/196/627/116899 (Accessed 3 June 2017).

Businessinsider. 2017. Two-thirds of the world's population are now connected by mobile devices. https://www.businessinsider.com/world-population-mobile-devices (Accessed 11 August 2023).

Carrier, M. 2017. Introduction to Digital Learning. In *Digital language learning and teaching*, 1–10. Routledge.

Carrier, M., M. Ryan, M. Damerow and K. M. Bailey. 2007. *Digital language learning and teaching: Research, theory, and practice*. Taylor & Francis.Mbanga and Mtembu Digital learning: Perceptions of lecturers at a Technical Vocational Education and Training college

Chinwendu, A. S. (2015). The use of instructional media in Nigerian Educational system: Principles, practice, problems and prescriptions. *International Journal of Innovative Scientific & Engineering Technologies Research 42*(1), 35-41.

Chukwuedo, S. &Omofonmwan, G. (2013). Information and communication technology: The pivot of teaching and learning skills in electrical and electronic technology programme in Nigeria. *International Journal of Vocational and Technical Education, 5*(6), 117-123.

Chukwunwendu, A. F. (2016). New dimensions in sourcing and utilization of resource materials for effective teaching and instruction in technical vocational education and training (TVET) in Nigeria. Educational Journal, 4(6- 1),24-30. Retrieved from http://www.sciencepublishinggroup.com/j/edu

Davies, S., J. Mullan and P. Feldman. 2017. *Rebooting learning for the digital age: What next for technology-enhanced higher education?* HEPI Report 93. Higher Education Policy Institute.

Davis, F. D. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*: 319–340.

Du Toit, J. 2015. Teacher training and usage of ICT in education. *New directions for the UIS global data collection in the post-2015 context.* Background paper for ICT in Education Statistics.

Duru, V. N. &Ozoji, B. E. (2011). Investigating the utilization of ICT and its application in the teaching computer studies in secondary schools in Owerri educational zone, *Journal of Educational Review, 2*(1), 133-142.

Edumadze, J. K. E., T. A. Ossei-Anto, G. Edumadze, W. K. Tamakloe and E. A. E. Boadi. 2014. Evaluating the awareness and perceptions of lecturers in using e-learning tools for teaching in University of Cape Coast. *International Journal of Computing Academic Research (IJCAR)* 3: 1– 11.

Enang, C. E &Okute, A. L. (2019). Leveraging on new technologies for skill acquisition of business education in tertiary institutions in Nigeria for the E-World. *Nigerian Journal of Business Education, 1*(6), 331-337.

Eze, T. I., Olumoko, B. O. & Obi, M. N. (2020). Effect of multimedia instructional strategy on student's academic achievement in mechanical trades in technical colleges. *Journal of Educational Development, 2*(4), 38-43.

Federal Republic of Nigeria (2016). *National Policy on Education.* Abuja: NERDC.

Garba, A. A., Guga, A. & Yusuf, H. O. (2016). Availability of effective utilization of electronic media for teaching social studies in colleges of education in North- East Nigeria. *International Journal of Research in Science Technology & Mathematics Education, 4*(1), 158-163.

Hayes, S. 2017. Digital learning, discourse, and ideology. In *The Encyclopaedia of educational philosophy and theory*, 1–6.

Hayes, S. and P. Jandrić. 2014. Who is really in charge of contemporary education? People and technologies in, against and beyond the neoliberal university. *Open Review of Educational Research* 1(1): 193–210.

Isaacs S. 2007. Invest Africa. *Using ICTs and blended learning in transforming TVET*, 143.

Jethro, O. O., A. M. Grace and A. K. Thomas. 2012. E-learning and its effects on teaching and learning in a global age. *International Journal of Academic Research in Business and Social Sciences* 2(1): 203.

Kotsik, B., N. Tokareva, F. Boutin and C. Chinien. 2009. ICT application in TVET. In *International handbook of education for the changing world of work*, 1879–1894.

Nyambane, C. O. and D. Nzuki. 2014. Factors influencing ICT integration in teaching – A literature review. *International Journal of Education and Research* 2(3): 136–155.

Nzimande, B. 2017. Address by Minister of Higher Education and Training, during the budget vote speech, National Assembly (16/05/2017). www.polity.org.za/dhet-blade-nzimande-address-by-minister-ofhigher-education (Accessed 11 August 2023).

Okafor, U. P. & Ejiofor, T. (2013). Utilization of e-learning resources by lecturers of vocational technical education departments in tertiary institutions in Enugu State. *International Educational Research, 12*(20, 56-61.

Okoye, R. Otuka, J. E. O. &Iheonunekwu. (2010). *Vocational and technical education in Nigeria: Trends and prospects.* Onitsha: Global Academic Group Online Academic Resources.

Oluwalola, F. K. &Awodiji, O. A. (2019). "Availability and utilization of e-learning facilities for management and business courses in universities in Kwara State, Nigeria". *Nigerian Journal of Business Education, 2* (6), 346-357.

Oso, S. O. (2010). ICT literacy among vocational and technical education teachers in Kogi State technical and vocational colleges: Skill gaps. *British Journal of Education, 5*(3), 21-30.

Oviawe, J. I.,Uwameiye, R.&Uddin, P. O. S. (2017).Bridging Skill Gap to Meet Technical, Vocational Education and Training School-Workplace Collaboration in the 21st Century. *International Journal of Vocational Education and Training Research, 3*(1) 7-14.

Polit, S. D. (2015). Utilization of information and communication technology by mechanical trades teachers in North Central Nigeria. *Unpublished MSc theses*, University of Jos.

Sherman, K. and S. K. Howard. 2012. Teachers' beliefs about first-and second-order barriers to ICT integration: Preliminary findings from a South African study. In *Proceedings of Society for Information Technology and Teacher Education International Conference*, 2098–2105).

Teo, T. 2010. A path analysis of pre-service teachers' attitudes to computer use: Applying and extending the technology acceptance model in an educational context. *Interactive Learning Environments* 18(1): 65–79.

Terande, T. J. (2012). Application of e-teaching and e-learning in Nigerian educational system. *Academical Research Internal, 3*(1), 30-36.

Thom-Otuya, V. C. &Ubulom, W. J. (2007). ICT as a tool for 'catch them young in business education'. Implication for the business education graduates. *African Journal of Education and Development Studies, 4*(1),91-105.

UNESCO (2002). *Information and communication technologies in teacher education: A planning guide.* Paris: UNESCO.

UNESCO Institute for Statistics. Education South African Government. 2017. www.gov.za/ABOUT-SA/education (Accessed 11 August 2023).

Venkatesh, V., M. G. Morris, G. B. Davis and F. D. Davis. 2003. User acceptance of information technology: Toward a unified view. *MIS Quarterly*: 425–478.

Vin-Mbah, F. I. (2016). Utilization of multimedia and hypermedia technologies in tertiary business education classroom in Anambra State. *Nigerian Journal of Business Education, 2*(3), 14-24.