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# STRATEGIES FOR UTILISING INFORMATION COMMUNICATION TECHNOLOGY (ICT) BY BASIC TECHNOLOGY TEACHERS FOR EFFECTIVE INSTRUCTIONAL DELIVERY IN OGUN STATE

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# STRATEGIES FOR UTILISING INFORMATION COMMUNICATION TECHNOLOGY (ICT) BY BASIC TECHNOLOGY TEACHERS FOR EFFECTIVE INSTRUCTIONAL DELIVERY IN OGUN STATE

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***Abstract***
The need to conduct an in-depth study on strategies for utilizing information technology by basic technology teachers in Lagos state is an uppermost interest to the researcher. The use of ICT for effective instructional delivery by basic technology teachers in schools is normally restricted to the use of microcomputers to teach instructional content. Basic technology teachers often find it difficult to apply ICT resources in teaching and learning due to the non-availability of the ICT resources at their disposal and as such, they lose interest in acquiring the necessary skills for effective use of ICT in teaching and learning of Basic technology. The use of ICT in teaching Basic technology according to Odumosu and Keshinro (2000) is revealed in learning aids which involves testing feedback on test results, individualized instruction, drills and practices and tutorials. These are commonly called computer-managed instructions (CMI) and computer-assisted instruction (CAI), using the computer to perform test management and teaching functions respectively. In utilizing ICT for effective instructional delivery, teachers' level of competence is important in terms of Basic ICT knowledge, ability to operate the computer software packages and other available resources. ICT can be utilized to develop comprehensive practical training for students, create E-learning for the students, promote digital literacy between students, create a culture of life-long learning and make the learning and teaching process look very attractive to both teachers and students.
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## Introduction

Over the years, the world has witnessed many monumental changes involving rapid development from the Stone Age, the atomic age, the nuclear age, the moon age and lately the information age. According to Odumosu and Keshinro (2019), the information age is the age in which explosion coupled with the rapid increase in the world population over the years and advances in science and

technology necessitated the need for quick and cost-effective means of communicating large ideas and information to a large world population. Indeed, there is hardly any human Endeavour or event that is not currently touched by the new technologies in communication called Information technology (IT) which has transformed the whole world into a small global village.

Information communication technology (ICT) according to Adewoyin (2016) is the new communications and computing technology used for creating, storing, selecting, changing, developing, receiving and displaying many kinds of information. Adewoyin classified ICT into three groups namely: those that process information e.g computers, those that disseminate information, e.g communications (electromagnetic devices and systems) and those presentations of information e.g multimedia. Adewoyin opines that Basic technology teachers who are not familiar with ICT will find themselves being threatened by professional obsolescence – a feeling that one is no longer relevant in the profession. Basic technology according to Al Hassan (2010) is aimed at giving children an awareness of technology and its implications as a tool for achieving the human purpose, developing practical capability for students to engage in technological activities and assisting students to acquire knowledge, and intellectual and physical skills. Basic technology is an integrated subject which comprises rise technology organization, building, woodwork, metalwork auto mechanics, electrical electronics, metals, plastics, ceramics and rubber. The subject has been integrated to provide a holistic orientation to junior secondary school students. The subject has been carefully planned and structured into a teaching sequence which consists of clear explanations and descriptions of how results are to be obtained with the use of tools, equipment, and materials.

The use of ICT for effective instructional delivery by basic technology teachers in schools is normally restricted to the use of microcomputers to teach instructional content. The use of ICT in teaching basic technology according to Odumosu and Keshinro (2009) is revealed in learning aids which involves testing feedback on test results, individualized instruction, drill and practice and tutorials. These are commonly called computer-managed instructions (CMI) and computer-assisted instruction (CAI), using the computer to perform test management and teaching functions respectively. Another use is seen in simultaneous where students can gain an understanding of reality by manipulating a representation of reality. Strategically, ICT is used to stimulate situations that can otherwise be carried out in a school workshop because of reasons such as safety, ethics,

cost, lack of equipment and tools, scale or abstractness. The recent changes in the world and within nations have brought about changes in educational goals. The schools are called not to only equip the learners with basic knowledge content in Basic technology, but also with higher cognitive skills, such as problem-solving and thinking skills that allow for sself-development and continuous learning. And information communication technology (ICT) skills. The basic technology is to bring technology education from the secondary school level with the enactment of the National Policy on Education (2004). The National policy on education (2004) stipulated that efforts should be made to indicate the following:

1. Preparation for useful living within the society
2. Preparation for higher education

The objectives of the Basic technology curriculum according to the National Policy on Education are:

1. To provide the student with an intelligent understanding of the increasing complexity of technology
2. Provide training manpower in applied technology grades
3. Inspire its students with a desire for self-improvement and achievement of excellence

Instruction delivery in Basic technology focuses on an instruction system which is a holistic way of looking at the teaching-learning process made up of competencies that are mutually interrelated to perform a common task, promoting effectiveness and efficiency in instruction. Abimbade (2019) reviewed instruction as an aspect of teaching. For instructional delivery to be effective in Basic technology, teachers need to know the social and economic background of the students, their previous knowledge, ability level, language, general aptitude, and the geographical location of the school which reveals the effectiveness of the instructional delivery.

A computer makes a lot of effect on Basic technology, most especially in stimulation, which presents the likeness of a situation, thereby making a learner play roles (Sales 2002). Further, where either the actual workshop equipment is unaffordable or where the outcome of the practical work might be dangerous, the computer can be used to stimulate the situation for easy explanation enabling the learners to make certain deductions and also provide the learners with probable consequences of his actions with the aid of a computer, learners can access Basic technology subject materials including visualization, animalization, sounds effects and internets which

facilitates instructional delivery and improve students achievement in basic technology (Saliu 2012)

Basic technology teachers who have been updated in the use of ICT facilitate instructional delivery that can effectively explore interactive video technology for teaching. Odumosu and Keshinro (2019) opined that interactive video technology can be used as an extension of computer applications, especially tutorials and it involves the interplay of computer software with a video disk that can provide a realistic picture instead of written text or a graphic representation, database for storage and manipulation of data, micro-computer based workshops, and multimedia and internet facilities.

Applying ICT will enable Basic technology teachers to reduce obstruction in lessons, and boredom conserves the teacher's energy, restructure the learning process, facilitates individualized learning, make learning interesting, motivating, and exciting, promote students' active participation, reduce problems of insufficient resources, allows moral learning autonomy amongst students, and minimize the problems of large class size. Therefore, technology teacher needs to devise a strategy for utilizing ICT to make this instruction effective. Effective is the process of doing the right thing in the right way.

**Statement of the Problem**

Despite the potential of ICT for enhancing instructional delivery of Basic technology some issues affected the plication for effective teaching and learning in schools. According to Odumosu and Keshinro (2019), most Basic technology teachers reported negatively that it was difficult for them to organize lessons, and that they needed more time for preparing lessons when computers were to be used. The use of computers is among the problems Basic technology teachers encounter when introducing computers to the instructional program. There were an insufficient number of computers and a lack of suitable software, difficulties in integrating computer use into the instructional program and difficulties in scheduling enough computers for their classes.

Alhassan(2010) opined that it is obvious that secondary schools do not have the resources and infrastructure in place to cope with the challenges and at the same time Basic technology teachers lack the knowledge, strategies, and training which will enable them to effectively apply ICT for their instructional delivery both class and workshop. Oftentimes, the need to constantly update teachers' knowledge cannot be overemphasized in other to effectiveness, fight competition,

promote technology and develop the student's technical skills through effective strategies which can be used in applying ICT resources for effective instructional delivery which is the main purpose of this study.

One is very much aware of the poor reading skills of Basic technology students in the state of workshop facilities, and the dearth of Basic technology textbooks to menta ion few. One contributing factor may be the emergent problems of old technology applied in instructional delivery; processing, storing, and presenting technical information as if it exists outside the culture of those who teach and learn it. Now that information communication technology (ICT) has broken the barrier and constraints of old technology to an extent, it is important to examine the strategies for utilizing information communication technology by Basic technology teachers for effective instructional delivery in Lagos state.

**Research questions**

The following research questions shall guide this study:

1. What are the various ICT resources available in schools for the use towards effective instructional delivery?
2. What are the competencies required by Basic technology teachers for use of ICT?
3. What are the levels of skills possessed by Basic technology teachers for the effective use of ICT?
4. What are the ways of utilizing information communication technology by Basic technology teachers towards instructional delivery?
5. How can Basic technology teachers apply these strategies for effective instructional delivery in both classroom and workshop?

**Methodology**

A survey research design was used for this study. This is a type of research design which focuses on gathering data to systematically describe the features, facts, and characteristics of a population under study. Survey research designs enable the researcher to gather data in, and systematic manner on the strategies for utilizing information communication technology (ICT) by basic technology teachers for effective instructional delivery in Lagos state.

This study was cover the junior secondary schools in Ogun state**.** The population for this study consists of sixty-nine (69) Basic technology teachers in thirty (30) secondary schools in Abeokuta (LGA). They are male and female teachers who teach basic technology in junior secondary schools. The information about the population was gotten from the schools by the researcher. Sixty-nine (69) technology teachers were sampled for this study. Purposive random sampling techniques were adopted for the study. All sixty-nine teachers constituted the sample for the study because of the relatively small size of the population. All teachers were given equal chances of being included in the sample for this study. A structured questionnaire was used to collect data for the study. The questionnaire was structured in line with the research questions formulated. The questionnaire has two sections: section A contained six items focusing on the information of the respondent. While section B focused on providing answers to research questions formulated on the six research questions. The items of the questionnaire were tailored towards the research question. The questionnaire was structured using four (4) a points Likert-type rating scale which refers to the degree to which the research instrument measures what it is designed to measure, as a highly valid test will yield accuracy in its instrument. The instrument was subjected to face and content validation by three experts. Their criticism was used to give the final design of the instrument. This is the degree of consistency attained using the research instrument. To ascertain that the instrument is reliable, the test-retest method of reliability the instrument was used. The researcher conducted a pilot test using ten basic technology teachers in four junior secondary schools in Ad0 Odo Ota Local Govt an area different from the population for the study.

The questionnaire was administered twice at an interval of two weeks and the responses of the respondents were compared to determine the reliability coefficient of the instrument, the coefficient of reliability was obtained using spearman's rank order of correlation formula.

A coefficient of 0.76 level of reliability was obtained. This was found adequate for the instrument. The researcher personally visited the schools and administered the questionnaires to the respondents; to make necessary clarification on it, an effort was made to collect the "questionnaire" on the same day to avoid loss of the instrument.

## Result

### Research Question 1

What are the various ICT resources available for effective instructional delivery in schools?

Data obtained from the study about this question were presented in table 1:

**Table 1: Respondents' responses on ICT resources available for instructional delivery**

| S/N | Items | Mean | SD | Remarks |
|---|---|---|---|---|
| **1** | The computer system is used for teaching basic technology in my school | 2.23 | 0.78 | Disagree |
| **2** | Internet facilities are available for sourcing more information on the topic to be taught in class and workshop | 2.14 | 0.89 | Disagree |
| **3** | Software packages such as AUTO-CAD, computer-based workshops and manufacturing processes are available in the school for teaching and learning | 2.29 | 0.87 | Disagree |
| **4** | The school organized the maintenance of multimedia equipment which facilitates teaching and learning | 2.39 | 0.69 | Disagree |
| **5** | Most computers in my school are obsolete | 2.68 | 0.75 | Agree |
| **6** | There is online library in my school | 1.93 | 0.82 | Disagree |
| **7** | The number of computers used for instructional delivery goes around the number of students | 2.46 | 1.11 | Disagree |
| **8** | Multimedia equipment in my school is not functioning well and is regularly powered with a power supply | 2.80 | 0.85 | Agree |

Table 1 shows that most of the respondents disagreed with the items, it reveals that most of the computers in their schools are obsolete, and the multimedia equipment in the schools is not functioning well and regularly despite the regular power supply. However, the items rejected reveals that computers were not used for the teaching of basic technology in the school, internet facilities were not available, software packages such as AUTO-CAD, computer-based workshop and manufacturing processes are also not available in the school and the remaining computers used for instructional delivery cannot go round the number of students in the class. Items 5 & 8 are accepted as agreed based on the decision that their mean rating was greater than =the 2.50 cut-off point.

**Research Question 2**

What are the competencies required by basic technology teachers for the use of ICT?

Data obtained from the study with regards to this question was presented in table 2 as presented below:

**Table 2: Respondents' responses on competence required by basic technology teachers**

| S/N | Items | Mean | SD | Remark |
|---|---|---|---|---|
| **1** | Basic technology teachers should be able to operate a computer system | 3.57 | 0.49 | Agree |
| **2** | In preparing a lesson, basic technology teachers should be able to use the internet to source information | 3.67 | 0.53 | Agree |
| **3** | There should be some level of ability to apply Microsoft office in preparing and delivering a lesson | 3.51 | 0.55 | Agree |
| **4** | Basic technology teachers should be able to design posters and charts using Corel draw on the computer | 3.36 | 0.72 | Agree |
| **5** | Basic technology teachers should be able to use PowerPoint effectively. | 3.29 | 0.66 | Agree |
| **6** | Basic technology teachers should be able to give assignments on the internet | 3.42 | 0.57 | Agree |
| **7** | Basic technology teachers should be able to manage students' results through computer | 3.64 | 0.48 | Agree |
| **8** | Basic technology teachers should be able to install software packages | 3.17 | 0.70 | Agree |

The result in table 2 above shows that most of the respondents agreed with all the items posted on competence required by basic technology teachers should be able to operate a computer system, use the internet to you for information in preparing lessons, they should possess some level of ability to apply Microsoft office in preparing and delivering a lesson, they should be able to design posters and charts using Corel draw a design on the internet, manage students results through the computer and they should be able to install software packages on the computer system. All the items were accepted based on the decision rule that the mean ratings are greater than the Mean═2.50

**Research Question 3**

What are the levels of skills possessed by basic technology teachers for the effective use of ICT?

Data obtained from the study about this question were presented in table 9 as presented below:

**Table 3: Respondents' responses on the level of ICT skills possessed by basic technology teachers.**

| S/N | Items | Mean | SD | Remarks |
|---|---|---|---|---|
| **1** | Most technology teachers can operate the computer system | 2.57 | 0.63 | Agree |
| **2** | Basic technology teachers can install software packages on the computer | 2.20 | 0.65 | Disagree |
| **3** | The use of PowerPoint to deliver instruction is mostly adopted by basic technology teachers | 2.22 | 0.56 | Disagree |
| **4** | Most basic technology teachers can use a computer to design charts and posters for facilitating teaching | 2.49 | 0.90 | Disagree |
| **5** | Basic technology teachers can use the printer to print documents | 2.71 | 0.59 | Agree |
| **6** | The use of drawing Tables and excels to manage the students' records on the computer system can be used by basic technology teacher | 2.77 | 0.64 | Agree |
| **7** | Most basic technology teachers can use a computer to search for information for lesson preparation | 2.58 | 0.76 | Agree |
| **8** | Most basic technology teachers can upgrade their computer system | 2.13 | 0.64 | Disagree |

Table 3 shows the responses of the respondents on ICT skills possessed by basic technology teachers. They agreed that most of the basic technology teachers can operate a computer system, use the printer to print documents, use drawing tables and excel to manage the student's records on the computer system, and they can use a computer to search for information for lesson preparation. Items 1, 5, 6 and 7 were agreed –a cut-off point greater than 2.50 while some disagreed on items 2, 3, 4 and 8 based on the decision rule that their mean ratings are lower than the **Mean= 2cut-off** off point.

**Research Question 4**

What are the ways of utilizing information communication technology by basic technology teachers towards instructional delivery?

Data obtained from the study with regards to this question were presented in table 4 as presented below.

**Table 4: Respondents' responses on ways of utilizing information communication technology by basic technology teachers towards instructional delivery.**

| S/N | Items | Mean | SD | Remarks |
|---|---|---|---|---|
| **1** | Do you agree that PowerPoint can be used for instructional delivery | 3.43 | 0.55 | Agree |
| **2** | Actual life situations in the industry can be represented through simulation with the use of ICT resources in the lesson presented in the workshop | 3.29 | 0.62 | Agree |
| **3** | Student internet can be enhanced using computers with multimedia to teach in class | 3.55 | 0.55 | Agree |
| **4** | Students can be given an assignment on the topic taught in class via the internet | 3.23 | 0.62 | Agree |
| **5** | The Internet can be used to develop lesson notes | 3.13 | 0.41 | Agree |
| **6** | Drawing can be made available for students to use, using Microsoft word | 3.04 | 0.67 | Agree |
| **7** | A boring class can be made lively using a computer for r lesson presentation | 3.57 | 0.60 | Agree |
| **8** | Classroom communication can be achieved via the internet | 2.96 | 0.84 | Agree |

Table 4 shows that most of the respondents agreed with all the items which include; PowerPoint which can be used for instructional delivery; actual life situations in the industry can be represented through simulation with the use of ICT resources in the lesson presented in the workshop; students interest can be enhanced using a computer with multimedia to teach in the classroom; a boring class can be made lively using computer for lesson presentation and drawing can also be made available for students using Microsoft word. Also, most of the respondents agreed that students can be given assignments on the topic taught in the class via the internet and the internet can be used to develop lesson notes and achieve classroom communication. All the items were accepted based on the decision rule that their mean ratings were greater than $X = 2.50$ cut-off point.

**Research Question 5**

How can basic technology teachers apply these strategies for effective instructional delivery in both classrooms and workshops?

Data obtained from the study with regards to this question were presented in table 5 as shown below:

**Table 5: Respondents' responses on strategies for effective instructional delivery**

| S/N | Items | Mean | SD | Remarks |
|---|---|---|---|---|
| **1** | Teachers of basic technology should always be encouraged to upgrade their knowledge in utilizing ICT for teaching in class | 3.70 | 0.52 | Agree |
| **2** | Schools should ensure that ICT facilities such as computers, multimedia internet etc are available for classroom use | 3.65 | 0.53 | Agree |
| **3** | In-service, re-training, seminars and workshops on the utilization of ICT for effective lesson presentation should be organized | 3.68 | 0.52 | Agree |
| **4** | Students should also be encouraged to embrace ICT for learning to facilitate teachers' effort | 3.67 | 0.63 | Agree |
| **5** | Obsolete facilities should be replaced | 3.67 | 0.43 | Agree |
| **6** | Schools should subscribe to journals that can expose basic technology teachers to the latest update in technology | 3.32 | 0.65 | Agree |
| **7** | A backup power supply should be made available in case of erratic power supply to power ICT facilities | 3.72 | 0.45 | Agree |
| **8** | Students should be taught how to utilize ICT for learning new things in basic technology | 3.71 | 0.51 | Agree |

Table 5 reveals that most of the respondents agreed with all the items; that teachers of basic technology should always be encouraged to upgrade their knowledge in utilizing ICT for teaching in the class; schools should ensure there are ICT facilities such as computers, multimedia, internet etc are available for classroom use, obsolete facilities should be replaced and back-up power supply should be supplied and schools should always subscribe for journals that can expose basic technology teachers to latest updates in technology.

Further, most of the respondents agreed that students should also be encouraged to embrace ICT for learning to facilitate teachers' efforts and that they should be taught how to utilize ICT for learning new things in basic technology as the need arises. All items were accepted based on the decision rule that their mean ratings were greater than the Mean = 2cut-off off point.

**Discussion of findings**

Based on the findings of this study, it has been discovered that most of the school don't have enough ICT resources which are essential for effective instructional delivery. The findings revealed that computers in schools are obsolete and even the available multimedia equipment is not functioning well despite the regular power supply available for usability. The finding revealed that basic technology teachers require some ICT competency level. Some of these are the ability to operate a computer system, the e internet for sourcing information for lesson preparation, the ability to apply Microsoft office in preparing and delivering a lesson, should be the ability to design posters and charts using Corel- draw on the computer system and use power-point effectively. The findings are in agreement with Saliu (2016), who stated that visualization, animations, sound effects and the internet facilitate instructional delivery and improve student achievement in basic technology, also the finding of this study revealed that basic technology teachers should be able to give an assignment to students on the internet, manage students result through the computer and should be able to install software packages on the system. Adewoyin (2016), also agreed with the findings as he stressed that teachers should be able to encourage students to download a copy of the slide for their study.

Most basic technology teachers can operate a computer system, use the printer to print a document, use drawing tables and excel to manage the student's record on the computer system and use a computer to search for information for lesson preparation, the findings agree with Adewoyin (2016) who suggested that ICT competence should include the use of power-point for instructional contents. However, the findings of the study revealed most technology teachers cannot install software packages on the system, use power-point for instructional delivery, cannot use computers to design charts and posters for facilitating teaching and cannot upgrade the computer system.

The researcher found out that there are various ways of utilizing ICT by basic technology teachers for effective instructional delivery, some of which according to the findings include using power-point for instructional delivery both in the classroom and workshop; representing actual life situations in the industry through simulation, enhancing students internet using a computer with multimedia to teach in the class, giving an assignment to students via the internet based on the topics taught in class, developing lesson notes through the internet, making drawing available for the student using Microsoft word, achieving classroom communication via the internet and making

a boring class lively by using the computer for lesson presentation. The findings agree with Ukit (2004), who stated that the role of information technology in Technical Education Administration management, teaching and learning process is enormous, spreadsheets, databases, word processing, communication, and graphic packages with their associated hardware are essential in the preparation and planning for instructional delivery. Saidu, Ukwumonu and Adamu (2016) also agree with the findings stated that there is a wide range of educational software for teaching students and also original materials developed specifically by specialized trained teachers to be used for effective teaching

Finally, the study revealed that teachers of basic technology can apply some strategies for effective instructional delivery, some of the strategies as found out in the analyses include: encouraging basic technology teachers to upgrade their knowledge in utilizing ICT for teaching in the class, students should also be encouraged to embrace ICT for learning to facilitate teachers' effort and that they should be taught how to utilize ICT for learning new things in basic technology. The findings are in agreement with Ogunleye (2006), who asserted that school libraries should ensure that users are always provided with the up-to-date data and information; it generally interconnects all the servers or information sources in an organization and makes them available for users through a browser. Njoku (2006) also agreed with the findings, he stated that ICT resources are at their disposal and within their immediate community to teach basic technology students' interest in ICT applications can be enhanced. Further, the findings of this study revealed that schools should ensure there are ICT facilities computers, multimedia, internet etc, available for classroom use, and the school should also subscribe to journals that can expose basic technology teachers to the latest update in technical schools. Should also organize in-service and re-training seminars and workshops on the utilization of ICT for effective lesson presentation, in the process of doing these, obsolete facilities should be replaced, and a backup power supply should be made available in case of erratic power supply to power ICT facilities to achieve effective instructional delivery through ICT resources and makes the teaching and learning of basic technology relevant to this contemporary time.

**Conclusion**

The need to apply various strategies to ensure the effective utilization of ICT resources by basic technology teachers for effective instructional delivery cannot be overemphasized. All efforts must be put together to achieve the application of ICT resources for the effective teaching of basic

technology in junior secondary schools. ICT has come to stay, and its resources as well are widely used in education both academic and non-academic activities. Basic technology teachers are used to the traditional method of teaching where teachers come into class with old textbooks which most times do not contain the correct modern discoveries in technology which are expected to be learned so that they can be relevant to the society to which they belong. There is a need for urgent and quick action on enhancing basic technology instructional delivery through forms of strategies with the utilization of ICT facilities which have been widely used almost in all areas of Education so that the teaching and learning of basic technology can be relevant to this contemporary time.

**Recommendations**

Based on the findings of the study, the following recommendations were made:

1. The use of ICT for instructional delivery in Technical/ Technology Education should be made a compulsory course in every tertiary institution where Technology Education and Vocational Technology Education are offered as a training programme for prospective technical teachers so that they can acquire the necessary ICT skills and make them relevant to this contemporary age where ICT has taken over operations of teaching and learning at all level of Education
2. Every student at junior schools should be exposed to how to use ICT resources to enhance the learning of new things in basic technology. This can be achieved through practical classes with the aid of available ICT resources. Teachers of basic technology should ensure that students are given assignments either on a daily or weekly basis which will make them learn new things in basic technology based on what they have been taught in the classroom and workshop
3. Government and school administrators should ensure the acquisition of ICT facilities and organization of seminars and workshops for basic technology teachers on how they can effectively apply them for instructional delivery to enhance their competence on the job
4. Industries should be encouraged to work in collaboration with schools in providing training on the various software packages used for various industrial processes and technological work or jobs so that what the teachers teach is of relevant use to the students later in life, in the world of work.

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