



# **Journal Of Educational Foundations And Development**

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Faculty of Education,  
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# **JOURNAL OF EDUCATIONAL FOUNDATIONS AND DEVELOPMENT**



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## **NOTES ON CONTRIBUTORS**

**Abdulkadir, A. M.** Dept. of Physical and Health Educ., Faculty of Education, University of Maiduguri, Nigeria.

**Abdulsalam, A.** Dept. of Physical and Health Education, Faculty of Education, University of Maiduguri, Maiduguri, Nigeria. Just2abdul@gmail.com.

**Adebayo, O.** Dept. of General Studies, Adeyemi College of Education, Ondo. funlade@gmail.com.

**Adegboyega, L.O.** Dept. of Counsellor Education, Faculty of Education, University of Ilorin, Ilorin, Nigeria. adegboyegateef@gmail.com.(+234)8035310866

**Adepeko, E. O.** adetundecrowns@email.com. Clothing and Textile Section, Dept. of Home Economics, Adeyemi College of Education, Ondo.

**Akinbomi, E. O.** Dept. of Mathematics, College of Science and Information Technology, Tai Solarin University of Education, Ijagun-Ijebu-Ode.

**Akinsanya, O. O.** (Ph.D). College of Applied Education and Vocational Technology, Tai Solarin University of Education Ijagun, PMB 2118 Ijebu-Ode. barkinsspot@gmail.com

**Alade, O. M.** (Ph.D), Faculty of Education, University of Lagos, Akoka-Lagos, Nigeria.

**Aliyu, Yunus,** Dept. of Arts Education, University of Ilorin, Ilorin, Nigeria. Aliyu.y@unilorin.edu.ng.

**Awe, B.** (Ph.D), School of Education, National Open University of Nigeria, Victoria Island, Lagos, Nigeria. Dr-abayomi36@yahoo.com. 08034505947, 08083969736

**Benwari, N. N.** (Ph.D). Dept. of Teacher Education, Faculty of Education, Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria.

**Ekine, A.** (Ph.D). Tai Solarin University of Education, Ijagun.  
ekineao@tasued.edu.ng, adefunkeekine@gmail.com.

**Enaboifo, F. A.** Dept. of Adult and Non-Formal Education, University of Benin,  
Benin City, Nigeria.

**Erinsakin, M. O.** (Ph.D). Dept. of Continuing Education and Adult and Non-  
Formal Education, Adeyemi College of Education, Ondo.  
erinsakinmartins@gmail.com.

**Idowu, E. K.** Department of Curriculum Studies and Instruction, School of  
Education, College of Education, Ikere-Ekiti.

**Job, G. C.** (Ph.D). School of Education, National Open University of Nigeria,  
Victoria Island, Lagos. Job.gabriel@yahoo.com.

**Lawal, M. A.** Department of Arts Education, University of Ilorin, Ilorin, Nigeria.  
nukumubarak@gmail.com 08079054942, 08168324226

**Maiwada, S.** (Professor), Dept. of Industrial Design, Ahmadu Bello University,  
Zaria, Nigeria.

**Maliki, E. A.** (Ph.D). Department of Educational Foundations, Faculty of  
Education, Niger-Delta University, Wilberforce Island, Bayelsa State, Nigeria.  
agnesmaliki@yahoo.com 0803772399

**Muhammad, J. I.** Kwara State Teaching Service Commission, Ilorin, Nigeria.

**Musa, S. M.** Dept. of Physical and Health Education, Faculty of Education,  
Bayero University, Kano.

**Odewale, T. R. (Mrs).** Dept. of Adult and Non-Formal Education, Federal  
College of Education (Special) Oyo, Nigeria. odemum@yahoo.com.

**Ogundowole, A.** School of Education, National Open University of Nigeria,  
Victoria Island, Lagos.

**Ogunjimi, M. O.** (Ph.D). Dept of Educational Psychology, Adeniran Ogunsanya  
College of Education, Otto-Ijanikin, Lagos, Nigeria. Ogunjimi-  
mayowa@yahoo.com (+234)8033912362

**Olubadewo, E. J.** Dept. of Social Studies, School of Arts and the Social Sciences, Federal College of Education, Kano. olubadewoej@yahoo.com. 08035990615

**Omoruyi, V. I.** Faculty of Education, University of Lagos, Akoka, Lagos, Nigeria. igbinvicom@gmail.com.

**Omotara, J. O.** Dept. of Counsellor Education, Faculty of Education, University of Ilorin, Ilorin, Nigeria.

**Oniha, S. I.** (Ph.D) University of Lagos, Nigeria. stephoniha@gmail.com.

**Oniye, A. O.** Dept. of Counsellor Education, Faculty of Education, University of Ilorin, Ilorin, Nigeria.

**Owolabi, H. O.** (Ph.D). Dept. of Social Science Education, Faculty of Education, University of Ilorin, Ilorin, Nigeria. Henryowolabi2000@yahoo.com. 08033733311.

**Oyitso, M. O.** (Ph.D). Dept. of Adult and Non-formal Education, University of Benin, Benin City, Nigeria.

**Paulley, F. G.** (Ph.D) mnim. Dept of Educational Foundations, Faculty of Education, Niger-Delta University, Wilberforce Island, Bayelsa State, Nigeria. paulleyfg@mail.ndu.edu.ng 08037768953.

**Saidu, A.** (Ph.D). Dept. of Arts Education, University of Ilorin, Ilorin, Nigeria. saiduabubakar@unilorin.edu.ng.

**Salima, S. S.** (Ph.D). Dept of Arts Education, University of Ilorin, Ilorin, Nigeria. Saliman.ss@unilorin.edu.ng.

**Sheu, A. L.** (Ph.D). Dept. of Educational Psychology/Guidance and Counselling, Alvan Ikoku University of Education, Owerri, Nigeria. Adaramaja4real@yahoo.com. (+234)8061254474.

**Tilije, R. N.** (Ph.D). School of Education, National Open University of Nigeria, Victoria Island, Lagos. rtilije@noun.edu.ng.

**Tobih, D. O.** (Ph.D). Dept. of Mathematics, College of Science and Information Technology, Tai Solarin University of Education, Ijagun, IjebuOde. drtobih002@gmail.com.

**Williams, J.** University of Ibadan, Ibadan 08033303914

**Zubaida, Y. A.** Department of English, Federal College of Education, Kano. Zubaidayahayaahmed. 08060820801.

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# ATTITUDE AND COMPETENCY SKILLS OF UNDERGRADUATE STUDENTS TOWARD ICT: A SINE QUA NON OF CBT AS AN INNOVATION IN TESTING

<sup>1</sup>DR. SHEU, Adaramaja L., <sup>2</sup>DR. OWOLABI, Henry O  
& <sup>3</sup>DR. OGUNJIMI, Mayowa O.

<sup>1</sup>Department of Educational Psychology/G&C,  
Alvan Ikoku University of Education, Owerri, Imo State, Nigeria  
+2348061254474 adaramaja4real@yahoo.com

<sup>2</sup>Dept. of Social Sciences Education, Faculty of Education, University of Ilorin, Ilorin, Nigeria.  
+2348033733311 henryowolabi2000@yahoo.com

&

<sup>3</sup>Department of Educational Psychology, Adeniran Ogunsanya College of Education,  
Otto-Ijanikin, Lagos, Nigeria: +2348033912362 ogunjimi\_mayowa@yahoo.com

## Abstract

*Computer- Based Test (C.B.T) is being adopted for assessment by many institutions in Nigeria due to increase in student's population, expansion work demands on academic staff, and advances in Information and Communication Technology (I.C.T). The successful implementation of any innovation in education depends largely on the attitude and competency skills of educators, who eventually determine how they are used in the teaching and learning process. The purpose of this therefore was to examine the attitude and competency skills of undergraduate students towards I.C.T, the basic skills of which required in C.B.T. The study adopted descriptive survey design. The population of this study comprised all undergraduate students of university of Ilorin. One thousand and twelve (1012) undergraduate students were randomly selected for the study. A Questionnaire measuring students I.C.T competence and attitude to I.C.T was used for data collection. The instrument had acceptable validity and had test re-test reliability coefficient of 0.82 and 0.84 for both students I.C.T competence and attitude to I.C.T respectively. Data collected were analyzed with percentages, mean, standard deviation, skewness and kurtosis. The findings of the study revealed that undergraduate students have positive attitude towards I.C.T; and moderate competence*

*in I.C.T. Based on the findings; it was recommended that the university system should provide adequate opportunity for all students to learn relevant computer skills and develop more positive attitude to complement their existing competence and attitude.*

*Attitude, competency skills, undergraduate students, ICT, CBT*

## **Introduction**

In recent times, advances in Information and Communication Technology (ICT) have led to widespread availability of computers in most parts of the world. The impact of this on curriculum, instruction and student learning at every level of education is spreading to the grassroots especially in developing countries like Nigeria. The use of computers in virtually all spheres of human activities is rapidly expanding. In fact, there is hardly any activity of man in the world today that is not in some measure affected by the use of computers. It does appear, however, that the application of computer technology to education is becoming more pronounced than in other areas.

Advancement in technology has thus provided the assessment community with considerable potentials in testing. Electronic testing is gradually taking the centre stage and one of the latest innovations in test delivery is named online test or Computer-Based Test (CBT). That is, a fixed form of the Paper and Pencil Test (PPT) administered on the computer. In recent times in Nigeria, individuals, schools, private organizations and government agencies have started to introduce the use of the computer systems for the conduct of examinations, interviews and other intricate selection processes in what is technically known as Electronic Examination or Computer-Based Test (CBT) or Computer-Based Assessment (CBA). This recent development has created a significant impact in the trends of public organization and educational development in Nigeria.

CBTs, according to Sorana-Daniela and Loventz (2007), are tests or assessments administered by computers in either stand-alone or dedicated network, or by other technological devices linked to the internet or the World Wide Web with most of them using Multiple Choice Questions (MCQs). The student or examinee is expected to access questions which have already been programmed in a computer, answer the questions using the system and feedback answers into the system within a specified time for scoring and grading through the system (Clariana and Wallance, 2002).

Computer based assessment has enabled educators and trainers to author, schedule, deliver, and report on surveys, quizzes, tests and examinations. These innovations are the results of educators who are exploring more efficient measurement tools in place of traditional Paper and Pencil Test (PPT). Paper-and-pencil test is a fixed items test in which all students answer the same questions on hardcopy test booklets, using pencil and an answer format prepared for them. Many of the advantages of CBTs over the traditional PPTs have been identified to include immediate scoring and reporting of students' test results, greater test security, test administration efficiency,

flexible test administration schedules, comparative cost advantage, the use of multimedia innovative item types, use of audio and large-print, accommodations for vision-impaired students, and the ability to measure response time (Bennett, 2001).

Presently, employers are conducting aptitude tests for their job seekers using the CBT. Universities and other tertiary institutions are admitting, registering and conducting electronic examinations for students through the internet and other electronic and networking gadgets (Olawale and Shafi'l 2010). Recently, the CBT has been widely adopted by Nigerian universities for the Post Unified Tertiary and Matriculation Examination (Post-UTME) otherwise called pre-admission screening even though very few Universities in Nigeria have started using CBT for their test / examinations.

The effectiveness of achievement tests as tools that yield scores that can be validly interpreted regardless of the mode of delivery of tests are often questioned (American Educational Research Association, 1999). For example, scores derived from CBT as compared to PPT might reflect not only the examinee's proficiency in the construct being measured but also the level of computer competency and attitude (Puhan, Boughton and Kim, 2007). This may affect the construct being measured and disrupt the comparison and interpretation of test scores across the two modes of administration.

ICT Competence according to Jegede and Okebukola (1992) is an awareness of technology and information technology, as well as having access to computers, at home, school or elsewhere. Taylor, Kirsch, Eignor, D., & Jamieson (1999) found that the concept of ICT Competence has encompassed computer use and experience. ICT Competence is the ability of the examinees to have the required basic computer skills or competence like; (a) Mastery of use of computer input devices like keyboard and mouse or touch pad (b) Ability to select software such as programmes (c) Ability to use word processing programmes such as MS-word.

It may be an indefensible omission if in the present state of ICT development in Nigeria, one assume such competence for the examinee without empirical evidence. The negative effect of CBT on unprepared or ill-prepared students can be enormous. This will likely induce psychological problems like stress and tension which will no doubt affect their performances. And any attempt to subject examinees that have not been adequately prepared to CBT is tantamount to basing their performance on two parameters namely, computer skills and also knowledge and skills in the segment area of the subject being tested. In fact, the computer knowledge and skills become the most important parameters for decision-making in this circumstance (Onuekwusi & Onuekwusi, 2010).

Research has been carried out in the area of the relationship between the ICT competence of examinees and their performance on computer-based testing. Some researchers have found that ICT Competence can affect the examinees' performance on

CBT (Hofer and Green, 1985 and Mazzeo & Harvey, 1988). It has been found that ICT competence was a major factor in explaining the difference between student's performances on computer-based arithmetic reasoning tests (Lee, 1986).

Recent studies have also shown that the successful implementation of educational technologies depends largely on the attitudes of educators, who eventually determine how they are used in the classroom. Attitude according to Sheu (2008) is an organized predisposition to think, feel, perceive and behave towards a cognitive object. Attitude is the degree of positive or negative effect associated with some psychological object. Bullock (2004) found that students' attitudes are a major enabling/disabling factors in the adoption of technology. Similarly, Kersaint, Horton, Stoul and Garofalo (2003) found that students who have positive attitudes toward technology feel more comfortable with using it and usually incorporate it into CBT. In fact, Woodrow (1992) asserts that any successful transformation in educational practices requires the development of positive user attitude towards the new technology. The development of students' positive attitude towards ICT is a key factor not only for enhancing computer integration but also for avoiding students' resistance to computer use (Watson, 1998).

### **Research Questions**

The following research questions were asked to guide the study:

1. What is the level of competence of University undergraduate students in the use of ICT?
2. What is the attitude of University undergraduate students toward ICT?

### **Methodology**

The descriptive survey design was used in the study. The population for this study comprised all undergraduate students of University of Ilorin. The choice of University of Ilorin was based on the fact that University of Ilorin is one of the Universities in Nigeria that are presently using computer to assess their undergraduate students. One thousand and twelve (1012) undergraduate students were randomly selected across the faculties at the University of Ilorin. Test administration procedures questionnaire was used to collect information on students' competence in ICT and students' attitude to ICT. The instrument is a non-cognitive scale because there is no right or wrong answer as far as responding to the items is concerned. More so, it is a multi-variate instrument since it is developed on two variables that are students' ICT competence and students' attitude to ICT. The instrument consists of three sections; A, B and C. Section A is designed to elicit personal information. Section B which contains 20 items is designed to provide adequate information on the students' competence level in the use of ICT. The items were structured on a 4-point modified Likert Scale such that a tick (✓) of No Competence (a skill that the students do not have) scored "1 point", Little Competence (a skill that the students engage in with some difficulty) scored "2 points", Moderate Competence (a skill that the students demonstrate with relative ease) scored "3 points",

and High Competence (a skill that the students demonstrate easily or engage very well) scored "4 points". Section C which also contains fourteen (14) items is designed to provide information on students' attitude toward ICT. Out of the 14 items, eight are negatively keyed while six are positively keyed. The items of the instrument were structured on a 4-point modified likert scale of Strongly Agree (SA) "4 points", Agree (A) "3 points", Disagree (D) "2 points" and Strongly Disagree (SD) "1 point". The negative items were reverse in the scoring so "Strongly Agree" is scored 1, "Agree" is scored 2, "Disagree" is scored 3 and "Strongly Disagree" is scored 4. The questionnaire had acceptable validity with the assistance of experts in the field of test construction and educational technology. The reliability coefficient of was found to be 0.82 for students' competence in ICT and 0.84 for students' attitude to ICT scale. Data collected for this study were analyzed using descriptive statistics of frequency and percentages, mean, standard deviation, kurtosis and skewness.

## RESULTS

### Research Question 1: What is the level of competence of University undergraduate students in the use of ICT?

In order to answer this research question, responses of the students to items 1 to 20 that address students' ICT competence were analyzed. The set of data were subjected to frequency and percentage, mean, standard deviation and range. The results are shown in tables 1a&b;

**Table 1a: Result of Descriptive Statistics of Students' Competence in ICT**

| Variable                  | N    | Mean  | Std<br>Deviatric | Minimur<br>Value | Maximu<br>Value | Rang |
|---------------------------|------|-------|------------------|------------------|-----------------|------|
| Students' Competence in I | 1012 | 52.57 | 9.55             | 20               | 80              | 60   |

Table 1a shows results of descriptive statistics of sampled University undergraduate students' competence in ICT. Minimum, maximum and range values were used to categorize students' responses as; 20-35 (low competence), 36-50 (little competence), 51-65 (moderate competence) and 66-80 (high competence). It revealed from the table a mean score of 52.57 which falls within the range of moderate competence (51-65). This shows that University undergraduate students have moderate competence in ICT.

To further discuss the level of competence of University undergraduate students in the use of ICT, frequency distribution of their responses were examined as shown in Table 1b.

**Table 1b: Distribution of Students' Response on their ICT Competence**

| Competence level    | Frequency | Percentage |
|---------------------|-----------|------------|
| No competence       | 3         | 0.3        |
| Little competence   | 444       | 43.9       |
| Moderate competence | 532       | 52.6       |
| High competence     | 33        | 3.3        |
| Total               | 1012      | 100%       |

Table 1b shows frequency distribution of sampled University undergraduate students' response on their ICT competence. It revealed that the students have moderate competence in the use of ICT with 52.6%.

**Research Question 2: What is the attitude of University undergraduate students to ICT?**

In order to answer this research question, responses of the students to items 1 to 14 that address students' attitude towards ICT were analyzed. The set of data were subjected to mean, standard deviation, range, kurtosis and skewness, the results are shown in table 2.

**Table 2: Result of Descriptive Statistics of Students' Attitudes to ICT**

| Variable              | N    | Mean  | Std. D | Minimum Value | Maximum Value | Range | Skewness | Kurtosis |
|-----------------------|------|-------|--------|---------------|---------------|-------|----------|----------|
| Students' Attitude to | 1012 | 45.57 | 4.903  | 14            | 56            | 42    | -.358    | .923     |

Table 2 shows results of descriptive statistics of sampled University undergraduate students' attitude to ICT. Minimum, maximum and range values were used to categorize students' response as; 14-35 (negative attitude) and 35-56 (positive attitude). It revealed from table 5 a mean score of 45.57 which falls within the range of positive attitude (35-56).

To further discuss the attitude of University undergraduate students to ICT, skewness and kurtosis value were used. The table shows a skewness and kurtosis value of -0.358 and 0.923 respectively. The negative skewness indicated that mass of the distribution is concentrated on the right of the figure which indicates positive attitudes of the students. The high kurtosis value also indicated a sharper peak of which the distribution is concentrated on the right of the figure which also indicates positive attitudes of the students. This could be best described with the following graph chart.

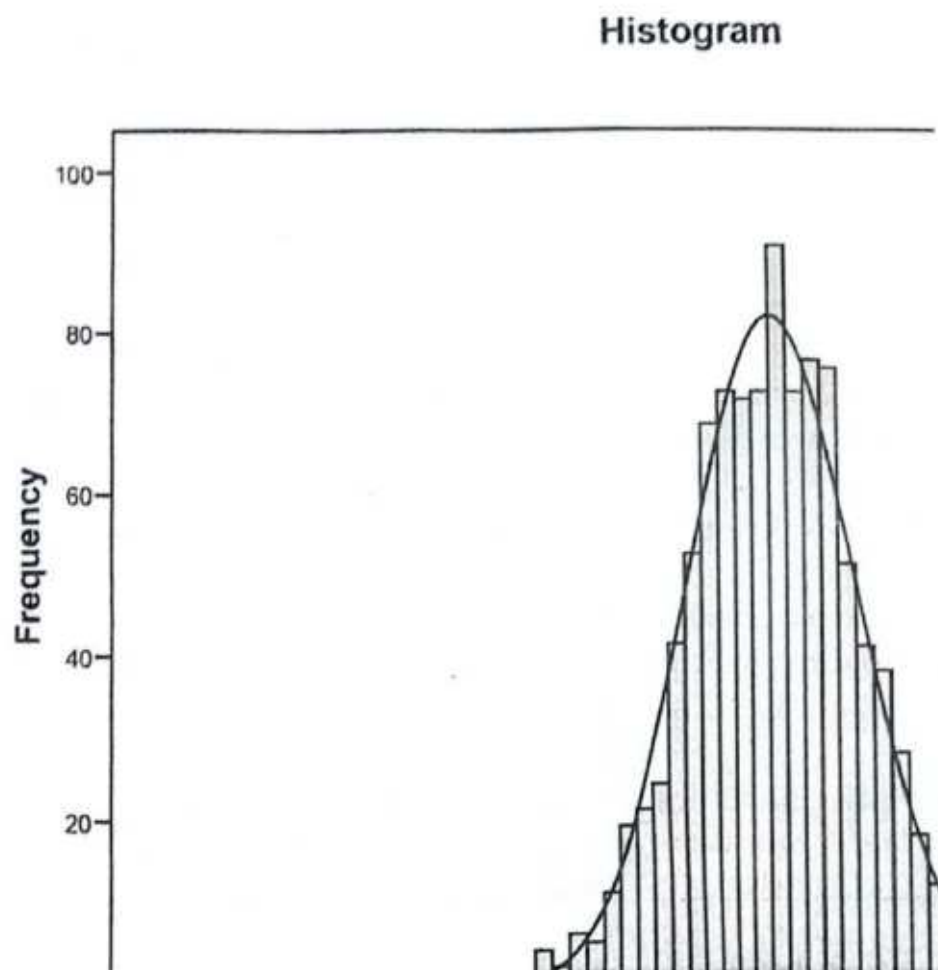


**Figure 4: Frequency curve and histogram of a negatively skewed and kurtosis distribution**

### **Discussion of Findings**

One of the major findings from the study was the one from of Research Question 1 which indicated that University undergraduate students have moderate competence in ICT. From the students' competence in ICT items, the finding revealed that the students have moderate competence in the basic pre-requisite and higher skills required to do CBT such as manipulation of the computer keyboard, operation of a word processing programme, use of the World Wide Web (WWW) to access information, creating and organizing computer files and folders and using internet for their school registration. The findings is in line with that of Onuekwusi and Onuekwusi (2010), who asserted that competence in ICT is the ability of the examinees to have the required basic computer skills or competence like; mastering of use of computer input devices like keyboard and mouse or touch pad, ability to select software or programmes, and ability

to use word processing programmes such as MS-word. The above competences according to them constitute the basic pre-requisite and higher skills required to do some mathematical computations and other complex aspects of testing. Examinees should possess computer skills to such a moderate competency level that the use of it in examination will minimally or insignificantly affect their performance. Any attempt to subject examinees that have no computer skills to CBT is tantamount to poor performance.

The findings of this study also revealed that University undergraduate students have positive attitude towards ICT. Students' attitudes are a major enabling/disabling factor in the adoption of technology. Kersaint, Horton, Stoul and Garofalo (2003) found that students who have positive attitudes towards technology feel more comfortable with using it and usually incorporate it into their learning. In fact, Woodrow (1992) asserts that any successful transformation in educational practices requires the development of positive user attitude towards new technology. The development of students' positive attitude towards ICT is a key factor not only for enhancing computer integration but also for avoiding University undergraduate students' resistance to computer based test. A large number of studies showed that students' computer competence is a significant predictor of their attitude towards ICT. Al-Oteawi (2002) found that most students who showed negative or neutral attitudes towards the use of ICT lacked knowledge and skill that would enable them to make informed decisions about computers.

### **Recommendation and conclusion**

1. It is recommended that the university system should provide adequate opportunity for all students in learning relevant computer skills to complement their present level of competence. This can be done by the introduction of courses at every level of undergraduate programme on basic computer skills such as computer appreciation certificate course meant only for graduating students which will not only improve their ICT competence but their attitudes towards ICT.
2. University system should also provide adequate facilities like enough desktop computers with UPS, high Random Access Memory (RAM), enough tables and chairs, standby generator, test security and many more required for both examinees and examiners to play their legitimate roles in successful use of CBT.
3. Educators should also encourage the use of the real ICT for teaching and learning. This will not only motivate the learners in learning but also prepare them for CBT.

Given that the use of computers in virtually all spheres of human activities is rapidly expanding including in examining, the use of CBT in the conduct of examinations in the University will be successful if all the students' characteristics are being considered.

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