Observation on the Integration of Instructional Technology in the Classroom: ICOT

Jennifer Corrigan

Nova Southeastern University

Author Note

Jennifer Corrigan, Doctor of Education: ITDE, Nova Southeastern University.

Jennifer Corrigan is an EdD student at Nova Southeastern University

Contact: jc2443@nova.edu

Abstract

This paper examines the use of a math teacher’s level of technology integration using the International Society for Technology in Education Classroom Observation Tool. The ICOT observation tool is a free computer-based Excel workbook that measures the level of technology integration in a lesson. The ICOT instrument includes the following sections: setting, groups, teacher role, activities, rating, and technologies used. The most recent (2007) version of the ICOT tool includes a section for checking off *NETS (National Education Technology Standards) for Students*, which are important for 21st century skill development. The kinds of technology used, specific standards that were addressed in the lesson, and structure of the classroom (individual, groups/pairs, whole class) are recorded in the ICOT observation instrument. Opinions of the International Society for Technology in Education Classroom Observation Tool, as well as suggestions for how to improve technology integration, are provided.

*Keywords:* ICOT, technology integration, *NETS for Students*

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This paper will examine an educator’s use of the International Society for Technology in Education (ISTE) Classroom Observation Tool (ICOT) to assess the level of technology integration by an educator of mathematics with 10 years of teaching experience. According to Bielefeldt (2012), the ICOT is, “a computer-based rubric designed to help observers assess the nature and extent of technology integration” (p. 1). The tool is free and can be downloaded from the ISTE website. The writer observed a 10th grade Algebra II summer school class with 12 students, all of whom failed the course during the previous school year. The ICOT was used to assess the level of technology integration by the educator in the specific lesson discussed.

**ICOT Assessment on the Integration of Technology**

Bloodman (2014) asserted, “Schools throughout the world continuously rely on technology as a critical component of the effort to improve teaching and learning practices” (p. 19). Ozdem (as cited in Pagan-Melendez, 2012) discussed how all learners should be given equal opportunity to learn with technology, regardless of gender, special education status, economic standing, ethnicity, and even current academic failure. Ozdem firmly maintained that all of these types of learners should be given the chance to learn with effective forms of technology. According to Bloodman (2014), effective forms of technology are those that adequately prepare learners to compete in the global economy.

The 2007 ISTE, State Educational Technology Directors Association (SETDA), and the Partnership for 21st Century Skills taskforce reported that education comes in last in terms of the use of technology as related to other chief industrial areas (Bloodman, 2014). As a result, Bloodman (2014) asserted that, “it remains imperative for educational leaders and policy makers to work feverishly to strengthen/enhance the nation’s technology integration profile if schools are to successfully prepare students to experience 21st-century learning” (p. 25).

ISTE created the ICOT with the intent to use in program evaluations by ISTE’s Research and Evaluation department (Bielefeldt, 2012). The Hewlett-Packard Company created the instrument in 2008 and was developed based off on a variety of classroom observational tools dating back to 1999. Uses of the tool have extended to needs assessments, assessing the outcomes of professional development by technology coordinators, to measure alterations in teacher pedagogy, and lastly, by individual teachers to reflect on practices (Bielefeldt, 2012).

 The ICOT had an original focus on the *NETS (National Education Technology Standards) Standards for Teachers,* First Edition (2000) and now focuses on the *NETS Standards for Students,* Second Edition (2007). The ICOT is merely an Excel workbook and is suited to work with PC’s and Macintosh computers that run Office 2011 (Bielefeldt, 2012). If the appropriate software is used, the ICOT can also be used on Android smart phones and Apple iPads. Updates to the ICOT, including extending beyond K-12 to include postsecondary grades; ongoing tracking of the time period of classroom events, and the options for keeping track of NETS standards, has expanded to include addressed standards and achieved standards by teacher and student (Bielefeldt, 2012).

 The ICOT beings with a “setting” section by requesting a date, project, school, name of observer and teacher being observed, grade level, subject, number of students and student devices, and then requests the observer to start the observation time by pressing the “click to record start time” macro-enabled box. The option to include setting notes, group notes, teacher role notes, and technology notes are given. Following the setting section is a section named, “groups,” then “teacher role,” “activities,” “ratings,” and “technologies used.” The instrument groups the *NETS for Students* standards into six individual categories for ease of use: creativity, communication, information fluency, thinking, citizenship, and technology operations. Check boxes with three minute intervals are formatted at the end of the observation for the observer to note when *NETS for Students* are used by the teacher and students. Once the observation is complete, the observer is to push the “click to record end time” macro-enabled box on the right-hand side of the table. Instructions on how to properly use the ICOT, an area to store data, and definitions of the various categories in the ICOT template are provided in the Excel workbook.

 Common assumptions about the ICOT include: (a) the assimilation of technology involves the monotonous use of digital tools to perform work; (b) technology can be incorporated into an assortment of instructional methods and learning activities, and (c) the *NETS for Students* give the most valuable structure for valuable integration of technology (“ISTE,” 2014).

**Observation Using ICOT**

 The observation took place in an Algebra II summer school classroom at a high school in Middlesex County, New Jersey. The educator is a colleague of mine who has been teaching for 10 years. The sample population included 12 tenth grade students who had failed Algebra II the previous school year. The cultural mix of students included Caucasian, African-America, Asian-American, and Indian. The ICOT observation tool recorded student interaction with the Promethean Interactive Whiteboard, use of the document camera, and the student responders (“clickers”). Students worked in pairs for the “do now” activity, worked independently for the 20 minute teacher-led lesson, worked in groups (3 students per group) to practice concepts taught, and then were individually assessed during the exit quiz using the clickers. All students were engaged when the teacher was showing where you see lines in the real world using the document camera. Most students had experienced the use of a document camera in the classes previously. The students were familiar with the clickers and how to punch in their answer to each question. The exit quiz that required the use of the clickers had 5 questions, 2 questions were multiple-choice, 2 were numerical answers, and the last question was true or false. The teacher encouraged the students to send her an email if they were still confused with the concepts taught in class because there would be a short quiz at the start of the next class. This educator did a wonderful job seamlessly integrating technology into her pedagogy. It was apparent that this teacher is comfortable with the use of technology and has assimilated various forms of technology into her instruction.

 *NETS for Students* are important for students to develop 21st century skills. The standards are vital for assessing skills and knowledge today’s learners will need in order to successfully compete in the global workforce. Simply knowing how to use technology is no longer sufficient. Individuals must learn how to use technology to analyze, learn, and explore (“ISTE,” 2014). Many *NETS for Students* standards were applied in the classroom observed. A few of the standards included: (1) applying existing knowledge to generate new ideas, products, or processes, (2) use models and simulations to explore complex systems and issues, (3) communicate information/ideas to audiences using a variety of media and formats, (4) understand and use technology systems, and (5) select and use applications effectively and productively.

**Conclusion**

The ICOT has the potential to be an effective instrument to measure technology integration in the classroom for teacher and student. To improve her use of technologies, the teacher observed could have the students come up to experience the use of a document camera instead of just showing the students various images of lines in the real world. In addition, the author would encourage the teacher to explore more uses of the student responders. The responders have the potential to cater to individual student learning needs and provide students with individual feedback. Further, the functions of the ICOT tool permit the observer to accurately record what types of technology are being used, by whom, at what point during the lesson, and which *NETS for Students* standards are being addressed. As the author conducted the classroom observation, she was able to keep accurate, detailed notes as to the level of technology integration and levels of student engagement throughout the lesson, which can prove to be a valuable tool for the observer and the classroom educator. Once the author read the instructions, looked over the observation format, and read the definitions, she found the ICOT instrument to be extremely user-friendly and effective in recording uses of technology in the classroom.

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