E-Assessment and the new Junior Cycle
Gerard Kilkenny

Introduction
The new Junior Cycle for post-primary schools in Ireland began in 2014, promising "...new approaches of assessment and reporting." (JCIE, 2017a). So, what exactly will be involved in this new assessment and is there a role for e-assessment?

The new Junior Cycle promises to transition from an emphasis on the final exam towards "...a system that hopes to capture and reward the multifaceted skills, knowledge and understandings of our students." It is hoped that classroom-based assessment will give students the opportunity to display their talents and skills in a supportive and encouraging way. Ongoing assessment will be both formative and summative with the teacher and student "checking in" on learning at regular intervals. It has been stated that "evidence of learning can be gleaned through observation, questioning, classroom talk, projects, tests etc." (JCT, 2017). There is no specific mention of e-assessment. However, does the "etc" include or preclude e-assessment?

Since it seems that the new classroom-based assessments are the only part of the new Junior Cycle that may provide for flexible modes of assessment, my response to this week's TELTA task focuses on classroom-based assessment and formative feedback.

Assessment Toolkit
"The most significant change in the new Junior Cycle is in the area of assessment." Highlighted in a green box is the sentence "Formative assessment, complemented by summative assessment, will be a key feature of the new Junior Cycle." (Department of Education and Skills, 2015, p.35).

An online 'Assessment Toolkit' has been provided for teachers who will be teaching students on the new Junior Cycle courses. This consists of four main sections:

(1) Learning Intentions and Success Criteria
(2) Effective questioning
(3) Formative feedback
(4) Students reflecting on learning. (JCIE, 2017b).

Phased Introduction of Subjects
The new Junior Cycle is being introduced on a phased basis over eight years from 2014 to 2022. The first subject to be assessed in the new Junior Cycle is English with the final examination in this subject due to take place in June 2017. The 'phase 2' subjects are Science and Business Studies with the final examinations in these subjects taking place in June 2018. The subject that I teach, Mathematics, will not have its final examination for the first time until 2021. (Department of Education and Skills, 2015a, p.35). Most of the information available with regard to the new assessment modes is in relation to English. Instead of 100% of the assessment being for a single summative examination, there will now be three parts to the assessment:

(a) Two 'Classroom-Based Assessments', conducted by the class teacher, which will assess oral language, reading and writing

(b) One 'Assessment Task' completed during class time but sent to the State Examinations Commission (SEC) for correction
(c) One 'Final Assessment' completed during State Examination time in June and sent to the SEC for correction. (JCIE, 2017c).

The final assessment in most subjects will be a written examination. For example, in English the final assessment will be a two-hour written examination paper with an allocation of 90% of the overall marks. The paper will be marked by the SEC and will not be assessed by the classroom teacher. (JCIE, 2017c).

Why change?
"In a nutshell – the main reason why change is needed is because we know that assessment can support students in becoming better learners." (NCCA, 2015, p.5)

Theoretical reasons for change
Many teachers have found the research by Paul Black and Dylan Wiliam, contained in a series of booklets that includes *Inside the Black Box* and *Working Inside the Black Box*, provides a good summary of the main actions teachers can take to improve their classroom assessment practices and the benefits of these practices. John Hattie's work is also very important as it provides an analysis of a substantial research base and shows the powerful impact of high quality feedback on raising standards. This groundbreaking book is the result of 15 years research, and it synthesises over 800 meta-analyses on the influences on achievement in school-aged students. The research represents the largest ever evidence-based research into what actually works in schools to improve learning. More recently, *Synergies for Better Learning*, published by the OECD, sets out the key factors needed to improve assessment practice based on an analysis of 28 countries.

Black and William (1998) produced a synthesis of more than 250 studies that showed that formative assessments, as opposed to summative ones, produce the more powerful effect on student learning.

There are two main ideas in Hattie's book:

(1) Expert teachers regularly focus on evaluating the effects they have on students, and adjust teaching methods accordingly
(2) When it is clear what teachers are teaching and what students are learning, student achievement increases. (Hattie, 2008).

Types of Assessment
Scriven (1967) coined the terms formative and summative evaluation. Assessment can be divided into three main categories:

(1) Diagnostic assessment (or pre-assessment) to determine what a student does and does not know about a topic at the beginning of a unit of study
(2) Formative assessment to determine a student's knowledge and skills as they progress through a unit of study
(3) Summative assessment that is made at the end of a unit of study to determine the level of understanding the student has achieved. (Scriven, 1967).

Caroline Gipps of the Assessment Reform Group is often credited with introducing the term Assessment for Learning (AfL) to the wider educational community. AfL comprises diagnostic and formative assessment. (McDowell, Sambell and Davison, 2009).

It will be interesting to see what approach will be taken by the National Council for Curriculum and Assessment (NCCA) to the Classroom-Based Assessments and to the Assessment Task when the new Junior Cycle Mathematics course commences in schools in September 2018 and is assessed for the first time between 2018 and 2021. What follows are some of the key ideas and challenges that may be associated with the possible introduction of e-assessment into classroom-based assessment.

The Evolution of E-Assessment
Computer-assisted assessment (CAA) using OMR on paper-based tests later became computer-based assessment (CBA) where assessment took place entirely at the computer. Where CBA takes place online via a browser, this is called e-assessment. (Conole and Oliver, 2007, p.149).

The Scope of E-Assessment
The e-assessment process includes:

(1) the creation, storage and delivery of assessments
(2) the capture, marking, storage and analysis of student responses
(3) the collation, return and analysis of their results. (SQA, 2003).

Diagnostic Assessment and E-Assessment
Schlater and Howie (2003) cite diagnostic tests as an application of e-assessment. Perhaps the best chance for e-assessment to be adopted in the new Junior Cycle will be in the area of diagnostic assessment. I have used this type of assessment in my teaching by analysing the scores achieved by students in different exam questions. For example, in this test on my website, the most badly answered questions are 5, 6 and 8. Using a scanner and optical character recognition software, the handwritten scores for each student's exam script questions can be easily converted into a spreadsheet file. (Kilkenny, 2016).

Authentication, Plagiarism and E-Assessment
There are many opportunities for students to plagiarise with the advent of the Internet. However, requiring students to submit assignments in digital format allows software products such as SafeAssign to detect plagiarism. (Blackboard, 2017).
There are a number of biometric user authentication methods that can be used in online examinations. These include fingerprint readers, retinal readers and keystroke dynamics. (Flior and Kowalski, 2010).

Mathematics and E-Assessment
There is support for e-assessment for Mathematics in some learning management systems (LMS). For example, there is a WIRIS plugin for the Moodle LMS which extends the rich text editor with a fully WYSIWYG equation editor for math and chemistry expressions. (WIRIS, 2017a). WIRIS quizzes for Maths and Science boast

improvements to every existing question type: True/False, Multiple choice, Matching, Short answer, Essay, and Embedded answers (Cloze). (WIRIS, 2017b).

ePortfolios and E-Assessment
There is a general shift across education from the assessment of products or outputs to assessing the processes of learning. New e-assessment methodologies need to be developed to meet these requirements. For example:
(a) how can we measure the quality of interactions that occur within an online discussion forum
(b) how can we use ePortfolios for tutor, self and peer assessment?

The Centre for Evaluation, Quality and Inspection (EQI) based in Dublin City University has been asked by the Professional Development Service for Teachers (PDST) to evaluate their National E-portfolio project. The use of E-Portfolios to enhance the quality of education has become more prevalent in Ireland and throughout the EU. (EQI, 2016). The Digital Strategy for Schools 2015-2020 promises the provision of online training in E-Portfolios and assessment to all registered teachers in Ireland and participation in a major EU-funded project, Eufolio. (Department of Education, 2015b).

Pros, Cons and Bias associated with E-Assessment
There is higher risk associated with e-assessment than e-learning. However, there are a number of benefits:

(1) Encourages student engagement (say, where there is no feedback from the teacher)
(2) for monitoring learning and identifying weaker students
(3) reduces marking and administration by teachers leaving more time for preparing lessons and devising learning interventions.

There are two fundamental reasons for a bias against e-assessment:

(1) a perceived inability to address 'deep' learning
(2) concerns about the authentication of students. (Plagiarism has been addressed by anti-plagiarism software). (Conole and Oliver, 2007, p.158).

Conclusion
This paper has looked at the new types of assessment that are being introduced for the first time into classrooms in the Irish secondary school system. It has also examined the benefits and challenges associated with e-assessment and whether it has a place in the 'Assessment Toolkit' that has recently been created for the new Junior Cycle. There is no mention of e-assessment, in relation to the new Junior Cycle, in any of the official materials produced by the Department of Education and Skills (DES), the National Council for Curriculum and Assessment (NCCA), Junior Cycle for Teachers (JCT). If this is to change, perhaps the best way forward is 'blended assessment' in the same way that the 'blended learning' model has become the acceptable face of e-learning.

References

Black, P., & Wiliam, D. (1998). Inside the black box-raising standards through classroom assessment. *Phi Delta Kappan, 80*(2), 139-+.

Black, P., Harrison, C., Lee, C., Marshall, B., & Wiliam, D. (2004). Working inside the black box: Assessment for learning in the classroom. *Phi delta kappan, 86*(1), 8-21.

Blackboard (2017). Use SafeAssign in Assignments. Retrieved February 10, 2017, from https://en-us.help.blackboard.com/Learn/Instructor/Assignments/060_SafeAssign.

Department of Education and Skills. (2015a). What will assessment look like? *Framework for Junior Cycle 2015*. Retrieved February 10, 2017, from https://www.education.ie/en/Publications/Policy-Reports/Framework-for-Junior-Cycle-2015.pdf

Department of Education and Skills. (2015b). *Digital Strategy for Schools: 2015-2020*. Retrieved February 12, 2017, from https://www.education.ie/en/Publications/Policy-Reports/Digital-Strategy-for-Schools-2015-2020.pdf.

Flior, E., & Kowalski, K. (2010). Continuous Biometric User Authentication in Online Examinations. Retrieved February 11, 2017, from http://lsia.fi.uba.ar/papers/flior10.pdf.

Hattie, J. (2008). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Rutledge.

Juniorcycle.ie (JCIE). (2017a). The junior cycle of post-primary education in Ireland is changing. Retrieved February 10, 2017, from http://juniorcycle.ie/

Juniorcycle.ie (JCIE). (2017b). Focus on Learning. Retrieved February 10, 2017, from http://www.juniorcycle.ie/Assessment/On-going-assessment

Juniorcycle.ie (JCIE). (2017c). English. Retrieved February 10, 2017, from http://juniorcycle.ie/Assessment/Subjects-and-short-courses/English

Junior Cycle for Teachers (JCT). (2017). Assessment. Retrieved February 10, 2017, from http://jct.ie/assessment/assessment.php

Kilkenny, G. (2016). Questions. Retrieved February 11, 2017, from http://gerardkilkenny.ie/diagnostics.pdf

McDowell, L., Sambell, K., & Davison, G. (2009). Assessment for learning: a brief history and review of terminology. Retrieved February 10, 2017, from https://core.ac.uk/download/pdf/4147211.pdf

National Council for Curriculum and Assessment (NCCA). (2015). *Focus on Learning: Facilitator's Guide*. Retrieved February 11, 2017, from http://www.juniorcycle.ie/NCCA_JuniorCycle/media/NCCA/Documents/Assessment/Facilitator%20Guide/Facilitators-Guide-Final-English_Sept2015.pdf

Organisation for Economic Co-operation and Development (OECD). (2013). *Synergies for better learning: An international perspective on evaluation and assessment*.

Sclater, N., Conole, G., Warburton, B, & Harvey, J. (2007). In G. Conole & M. Oliver (Eds). *Contemporary perspectives in e-learning research: themes, methods and impact on practice*. Routledge.

Sclater, N., & Howie, K. (2003). User requirements of the "ultimate" online assessment engine. *Computers & Education, 40*(3), 285-306.

Scottish Qualifications Authority (SQA). (2003). SQA Guidelines on Online Assessment for Further Education. Glasgow Dalkeith: Scottish Qualifications Authority.

Scriven, M. S. (1967). The methodology of evaluation (Perspectives of Curriculum Evaluation, and AERA monograph Series on Curriculum Evaluation, No. 1). Chicago: Rand NcNally.

The Centre for Evaluation, Quality and Inspection (EQI). (2016). National E-portfolio Project Evaluation. Retrieved February 12, 2017, from https://www.dcu.ie/research/news/2016/apr/national-e-portfolio-project-be-undertaken-dcu-centre-eqi.shtml.

WIRIS (2017a). WIRIS Math & Science. Retrieved February 10, 2017, from https://moodle.org/plugins/filter_wiris.

WIRIS (2017b). WIRIS Quizes for Math & Science. Retrieved February 10, 2017, from https://moodle.org/plugins/view.php?id=26.