Online Learning and Physical Education – A Literature Review

Christina Zientek

Sam Houston State University

Online Learning and Physical Education – A Literature Review

Due to a worldwide pandemic, online and distance learning courses have leaped to the forefront as an educational delivery model. While some subjects assimilate easily into an online platform, other educators have struggled to adequately assess their skill-based content. In a traditional classroom, rubrics have emerged as a practical assessment in measuring skill-based content (Harvey, Bauserman, & Bollinger, 2012). Educators have used these tools to bridge the assessment gap between knowledge-based content and skill-based application. This literature review focuses on the juxtaposition of rubrics as online skill assessments, particularly in physical education, where assessing specific elements' application can improve student motor performance and help students identify principles applied to practice and conditioning (Wang & Rairigh, 2006). This literature review aims to review previous research in this area and determine where potential research could expand.

Online vs. Traditional Classroom

While there is some discrepancy over the superiority of online vs. traditional classrooms, research reflects that online courses are, at the very least, comparable to face-to-face (f2f) methods. Bollinger and Waslik (2009) reviewed previous literature and determined that none of the earlier studies indicated lower student performance within online courses. Many studies that assess test scores and grades also reveal that student success in these areas is comparable to f2f courses (Arbaugh, 2000; Collins & Pascarella, 2003; Neuhauser, 2002; Sapp & Simon, 2005; Silver & Nickel, 2005). However, these authors often suggest that a "no significant difference" finding could be influenced by additional factors such as previous knowledge, student motivation, or variances in learning styles (Bourelle, Bourelle, Knutson & Spong, 2015).

Some research revealed that online courses delivered a more effective; a substantial review of six years of online course evaluation reports showed that online instruction demonstrated a slight improvement over traditional classroom methods (Olsen & Wisher, 2002). A meta-analysis conducted by Shachar and Nuemann (2010) corroborated those findings; their twenty-year study concluded that "the experimental probability of attaining higher learning outcomes is greater in the online environment than in the face-to-face environment." While the research has not definitively stated that one delivery method is better than the other, it appears that online instruction is no less effective than traditional classroom instruction.

Online Course Growth

Nagel (2009) predicted that online courses would become an established offering in most colleges and universities, and by 2014 the majority of students would attend at least one online course. A majority of institutions identified online education as part of their long-term strategy, identifying it as a "critical component" (Allen & Seaman, 2011). Indeed, the growth rate of online enrollments was ten times more than the overall growth rate of higher education enrollments (Allen & Seaman, 2011), but that number has exploded in the wake of the COVID-19 pandemic. While overall student enrollments are down, online registrations are skyrocketing (National Student Clearinghouse Research Center, 2020). Because online offerings are not bound by time or instructional space, this creates new opportunities for students, faculty, and educational institutions (Mayadas, Bourne, & Bacsich, 2009).

Student Satisfaction and Multimedia in Online Courses

An older survey from The Sloan Consortium (2002) reported that students were "typically pleased with their experiences" during online courses. Later research continues to support that statement. Finlay, Desmet, and Evans (2004) found that student participation and

satisfaction were higher online, and students' comments suggested that online instruction enabled interactive community building. Indeed, online students who identified as introverts tend to participate more in online discussions than in traditional classrooms (Meyer, 2003; Picciano, 2002). Boyd (2008) found that online students preferred the platform's interactivity. This interactivity is expanded through multimedia resources; flat resources such as static text documents result in lower engagement and student satisfaction (Bollinger & Waslik, 2009). Faculty can utilize their talents and versatility when developing online educational experiences by incorporating text, audio, video, & images (Haley, 2010). These multimedia items elevate the student experience and contribute to the cultivation of multimodal literacies that allow students to communicate ideas beyond traditional print-based writing (Lutkewitte, 2014; Takayoshi & Selfe, 2017). Anderson (2008) emphasized the "motivational potential" of multimedia projects and that the innovative technology promoted increased engagement with the program. The combined usage of pictures, text, and color has also been shown to reduce cognitive load (Majooni, Masood, & Akhavan, 2015). Audio items can draw the learner's attention towards the visuals described and can even help clarify and demonstrate abstract concepts (Lai, 2000). Video is an effective method to help teachers bridge the gap between theory and practice (Seidel, Blomberg, & Renkl, 2013). Video also appears to give students a deeper understanding of content, as students have shown to score higher on examinations with video-augmented content rather than paper instruction alone (Chi, Pickrell, & Riedy, n.d). The integration of multimedia options has permitted the evolution of new and varied content delivery; these multimodal compositions offer students engaging learning experiences while instructors have flexibility in their instructional approach (Bourelle, Bourelle, Knutson & Spong, 2015; Stanković, Maksimović, & Osmanović, 2018). While the value of multimedia content has been heavily

explored and documented, the subject of assessment differentiation in an online environment is still scarce (Haelermans, Ghysels, & Prince, 2015).

Learning Management Systems

Evolving technology is transforming traditional instruction methods and giving rise to a host of new options, challenges, and resources. As the corporate workplace has embraced these technologies, there is a corresponding need for educational systems to address these 21st-century skills (McCurry, 2003). The ability to deliver personalized instruction is increasingly important to target specific problems within the modern educational system (Stanković, Maksimović, & Osmanović, 2018). Learning management systems (LMS) are becoming the standard delivery method of this personalized instruction (Akhter, 2015). The increased usage and course involvement by both students and faculty underscore the necessity for effective use of an LMS (Claar, Portolese Dias, & Shields, 2014). LMSs can provide flexibility and personalization in instruction delivery, but there are still challenges to consider and address during adoption (Bradford, Porciello, Balkon, & Backus, 2007). Online courses present a unique challenge, because the instructional designer will often have limited information about the potential learners (Dick, Carey, & Carey, 2005). The overabundance of online tools may also cause some online courses to suffer; the educational resources should be chosen carefully to align with course learning objectives (Koszalka & Ganesan, 2004).

Assessment Literacy, Function, and Alignment

Assessment literacy is the knowledge of assessment quality and efficacy (Stiggins, 1999). An understanding of assessment literacy is necessary to establish an effective rubric. According to Stiggins et al. (2007), there are five central aspects of assessment quality: clear purpose, clear targets, sound design, effective communication, and student involvement. When assessment is

used for certification or selection, it is referred to as a summative assessment (Stiggins et al., 2007). Instructors can utilize this assessment method to either support the students' learning process or as an accountability method (Borghouts, Slingerland & Haerens, 2017). If the assessment is utilized as a part of the learning process, it becomes a formative assessment (Black and Wiliam, 1998; Wiliam, 2011). Formative assessments determine where students are in the learning process, where they need to go, and how to get there (Broadfoot et al., 2002). Feedback is an intricate part of formative assessment and is more effective when it includes active student involvement (Black and Wiliam, 2009; Pat El et al., 2013). Feedback reduces discrepancies between performance and learning goals (Hattie & Timperly, 2007). Interestingly, teachers feel that the implementation of formative assessment is a challenge (Hay, 2006; MacPhail & Halbert, 2010).

Instructors should clearly describe learning goals and choose instructional activities aligned with them (Borghouts, Slingerland & Haerens, 2017). In an aligned curriculum, assessment tasks are designed so that both teachers and learners can reflect on their achievement (Borghouts, Slingerland & Haerens, 2017). If assessments do not align with the learning goals, the evaluation will be ineffective (Collier, 2011; Hay & Macdonald, 2008; Hay & Penney, 2009).

Assessments in Physical Education

Penney et al. (2009) assert that curriculum, pedagogy, and assessment are interrelated, fundamental dimensions of quality physical education (PE). However, PE educators struggle to develop valid and reliable grading systems (Annerstedt & Larsson, 2010; Dinan-Thompson & Penney, 2015). Multiple researchers have expressed concern about assessment quality in physical education (Hay & Penney, 2009; López-Pastor et al. 2013; Thorburn, 2007; Veal,

1988), and advocate for assessment literacy among PE teachers (Collier, 2011; Dinan-Thompson & Penney, 2015). While PE assessment is addressed in international research literature, research on assessment practices are still scarce (Borghouts, Slingerland, Haerens, 2017). One study in the US determined a high prevalence of teacher observations as a primary assessment instrument (Mintah, 2003), while other studies suggested that US instructors rely on written assessments more heavily than other nations (Imwold, Rider, & Johnson, 1982; Kneer, 1986; Matanin & Tannehill, 1994; Mintah, 2003; Veal, 1988). PE educators in Scotland, England, and Australia found assessment creation a "significant professional challenge" (Thorburn, 2007).

Assessments and learning goals do not appear to be aligned in PE practice (Chan, Hay, and Tinning, 2011; Redelius & Hay, 2012). Early research with US PE teachers revealed that students were primarily assessed on attendance, participation, dress, and effort rather than student knowledge or skills (Matanin & Tannehill, 1994). This lack of alignment with standards may leave students confused or ill-informed about physical education goals (Erdmann, Chatzopoulos, & Tsormbatzoudis, 2006; Redelius & Hay, 2012; Zhu, 2015). Student expectations for PE assessment are often inconsistent with official standards (Borghouts, Slingerland, Haerens, 2017). Research suggests that low levels of accountability for PE instructors contributes to insufficient alignment between learner goals and assessments (Dinan-Thompson & Penney, 2015).

Evolution of Online Assessment Methods

Traditional courses historically provided clearly defined and tightly enforced boundaries (Kress, Jewitt, & Tsatsarelis, 2000). Common instruction methods and assessment included writing, speech, numerical means, and limited images (Kress & Selander, 2012). At the turn of the century, the communication of ideas using video, web design, and multimedia materials were

somewhat sporadic, but beginning to emerge in the educational landscape (McCurry, 2003). Technology began to create a conflict within the traditional learning norms, adding new ideas that require the transformation of the existing educational system (Stanković, Maksimović, & Osmanović, 2018). The changing landscape of communication brought new modes other than language into play (Kress, Jewitt, & Tsatsarelis, 2000). These new, multimodal options erode traditional boundaries, emphasizing visual representations and allowing the possibilities of "an aesthetic discourse into a domain where previously it had no place" (Kress, Jewitt, & Tsatsarelis, 2000). The concept of multimodal communication is beginning to influence the instructional community (Kress, Jewitt, & Tsatsarelis, 2000), and some researchers reveal that focusing on language alone is no longer enough (Lankshear & Knobel, 2011). Learning management systems are equipped to address multimodal delivery and assessment, as well as other forms of differentiation, when best practices are applied. Continuous feedback throughout the course is necessary for a successful online learning program (Akhter, 2015). Students also prefer choice within the online class—for example, when they are allowed to select learning modules from a menu of choices (Lindgren & McDaniel, 2012).

Rubrics as a Differentiated Skill Assessment

Beasley and Beck (2017) attempted to define differentiation within an online setting and found that online instructors fell into two distinct schools of thought. Online teachers would either describe why a student needed differentiation or what material required to be differentiated; this differed significantly from traditional teachers (Beasley & Beck, 2017). They also pointed out that assessment data was "notably absent" to determine the need for differentiation. Future research should consider how online teachers differentiate and decide to adjust instruction (Beasley & Beck, 2017). There also appears to be a lack of research where

differentiated online assessment has been documented and measured. In a traditional classroom, differentiation can be addressed by allowing skill-based assessments, which are often approached with a rubric. Rubric usage accelerated as both education and industry pressed for a less subjective, arbitrary grading system with coded transparency (Sadler, 2009). Rubrics are often classified as holistic or analytic, depending on the final performance's wholeness (Howell, 2011). Holistic rubrics focus on the overall performance rather than the specific task, while analytic rubrics consider each criterion separately in the grading process (Riebe & Jackson, 2013). Sadler (2005) found that rubric usage improved teacher judgment on student work quality, as rubrics shifted the focus of the content from criteria-based versus a standard-based guide. Research reveals that instructional rubrics promote students' learning and enhance the instructional process in physical education (Wang & Rairigh, 2006). Rubrics are widely advocated in education but have become a specific focus for physical education (Collier, 2011; Hay, 2006; Hay & Penney, 2009; NíChróinín & Cosgrave, 2012). Physical educators have proven capable of using rubrics to assess physical activity and sports standards with minimal training (Williams & Rink, 2003).

Conclusion

There are several opportunities to expand research within the field. Online assessment differentiation is not specifically mentioned in the reviewed literature, although the individual components appear to have a wide body of research. Assessments within physical education, particularly in the accountability of physical educators, is intriguing. The differing perspectives of online versus traditional teachers' perceptions of differentiation also requires additional research. Finally, the use of a rubric to assess physical activity online may be a solution to assessing skill-based concepts during the pandemic.

References

Akhter, N. (2015). Distance education at a glance. *Journal of Educational Research*, *18*(2), 1–13.

Allen, I. & Seaman, J. (2014). *Grade change: Tracking online education in the United States.* Babson Park, MA: Babson Survey Research Group.

Anderson, D. (2008). The low bridge to high benefits: Entry-level multimedia, literacies, and motivation. *Computers and Composition, 25*(1), 40–60.

Annerstedt, C., & Larsson, S. (2010). I have my own picture of what the demands are: Grading in swedish PEH – Problems of validity, comparability and fairness. *European Physical Education Review, 16*(2), 97–115.

Arbaugh, J. (2000). How classroom environment and student engagement affect learning in Internet-based MBA courses. *Business Communication Quarterly, 63*(4), 9–26.

Beasley, J., & Beck, D. (2017). Defining differentiation in cyber schools: What online teachers say. *TechTrends: Linking Research & Practice to Improve Learning, 61*(6), 550–559.

Black, K., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education, 5*(1), 7–74.

Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability, 21*(1), 5–31.

Bollinger, D., & Wasilik, O. (2009). Factors influencing faculty satisfaction with online teaching and learning in higher education. *Distance Education, 30*(1), 103-116.

Borghouts, L., Slingerland, M., & Haerens, L. (2017). Assessment quality and practices in secondary PE in the Netherlands. *Physical Education and Sport Pedagogy, 22*(5), 473-489.

Bourelle, A., Bourelle, T., Knutson, A. V., & Spong, S. (2016). Sites of multimodal literacy: Comparing student learning in online and face-to-face environments. *Computers and Composition, 39*, 55–70.

Boyd, P. (2008). Analyzing students' perceptions of their learning in online and hybrid first-year composition courses. *Computers and Composition, 25*(2), 224–243.

Bradford, P., Porciello, M., Balkon, N., & Backus, D. (2007). The Blackboard learning system: The be all and end all in educational instruction? *Journal of Educational Technology Systems, 35*(3), 301–314.

Broadfoot, P., Daugherty, R., Gardner, J., Harlen, W., James, M., & Stobart, G. (2002). *Assessment for Learning: 10 Principles*. Cambridge: University of Cambridge School of Education.

Chan, K., Hay, P., Tinning, R. (2011). Understanding the pedagogic discourse of assessment in physical education. *Asia-Pacific Journal of Health, Sport and Physical Education, 2*(1), 3–18.

Chi, D., Pickrell, J., & Riedy, C. (n.d). Student learning outcomes associated with video vs. paper cases in a public health dentistry course. *Journal Of Dental Education, 78*(1), 24-30.

Claar, C., Portolese Dias, L., & Shields, R. (2014). Student acceptence of learning management systems: A study on demographics. *Issues in Information Systems, 15*(1), 409.

Collier, D. (2011). Increasing the value of physical education: The role of assessment. *Journal of Physical Education, Recreation & Dance 82*(7), 38–41.

Collins, J., & Pascarella, E. (2003). Learning on campus and learning at a distance: A randomized instructional experiment. *Research in Higher Education, 44*(3), 315–326.

Dick, W., Carey, L., & Carey, J. (2005). *The systematic design of instruction.* Pearson/Allyn and Bacon.

Dinan-Thompson, M., & Penney, D. (2015). Assessment literacy in primary physical education. *European Physical Education Review 21*(4), 485–503.

Erdmann, R., Chatzopoulos, D., & Tsormbatzoudis, H. (2006). Pupils grading: Do teachers grade according to the way they report?" *International Journal of Physical Education, 43*(1), 4–10.

Finlay, W., Desmet, C., & Evans, L. (2004). Is it the technology or the teacher? A comparison of online and traditional English composition classes. *Journal of Educational Computing Research, 31*(2), 163–180.

Haelermans, C., Ghysels, J., & Prince, F. (2015). Increasing performance by differentiated teaching? Experimental evidence of the student benefits of digital differentiation. *British Journal of Educational Technology, 46*(6), 1161–1174.

Haley, K. (2010). Wired and tired: The cool and the agony of teaching online. *Social Work Review, 1*, 58-63.

Harvey, M., Bauserman, A., & Bollinger, B. (2012). Pilot test of an employability skills rubric: A component of the summary of performance report. *Career Development and Transition for Exceptional Individuals*, *35*, 118-128.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research 77*(1), 81–112.

Hay, P. (2006). Assessment for Learning in Physical Education. In Kirk, D., Macdonald, D., & O'Sullivan, M., *The Handbook of Physical Education*, (pp. 312–325). Sage.

Hay, P., & Macdonald, D. (2008). (Mis)appropriations of criteria and standards-referenced assessment in a performance-based subject. *Assessment in Education: Principles, Policy & Practice 15*(2), 153–168.

Hay, P., & Penney, D. (2009). Proposing conditions for assessment efficacy in physical education. *European Physical Education Review 15*(3), 389–405.

Hay, P., & Penney, D. (2013). *Assessment in Physical Education: A Sociocultural Perspective*. London: Routledge.

Howell, R. (2011). Exploring the impact of grading rubrics on academic performance: Findings from a quasi-experimental, pre-post evaluation. *Journal on Excellence in College Teaching, 22*(2), 31-49.

Imwold, C., Rider, R., & Johnson, D. (1982). The use of evaluation in public school physical education programs. *Journal of Teaching in Physical Education, 2*(1), 13–18.

Kneer, M. (1986). Description of physical education instruction theory/practice gap in selected secondary schools. *Journal of Teaching in Physical Education, 5*, 91–106.

Koszalka, T., & Ganesan, R. (2004). Designing online courses: A taxonomy to guide strategic use of features available in course management systems (CMS) in distance education. *Distance Education, 25*(2), 243-256.

Kress, G., Jewitt, C., & Tsatsarelis, C. (2000). Knowledge, identity, pedagogy. Pedagogic discourse and the representational environments of education in late modernity. *Linguistics and Education, 11*, 7–30.

Kress, G., & Selander, S. (2012). Multimodal design, learning and cultures of recognition. *The Internet and Higher Education, 15*, 265–268.

Lai, S. (2000). Influence of audio-visual presentations on learning abstract concepts.

International Journal Of Instructional Media, 27(2), 199-206.

Lankshear, C., & Knobel, M. (2011). *New literacies*. Open University Press.

Lindgren, R., & McDaniel, R. (2012). Transforming online learning through narrative and student agency. *Journal of Educational Technology & Society, 15*(4), 344–355.

López-Pastor, V., Kirk, D., Lorente-Catalán, E., MacPhail, A., & Macdonald, D. (2013). Alternative assessment in physical education: A review of international literature. *Sport, Education and Society, 18*(1), 57–76.

Lutkewitte, C. (2014). *Multimodal composition: A critical sourcebook*. Bedford/St. Martin's.

MacPhail, A., & Halbert, J. (2010). We had to do intelligent thinking during recent PE: Students' and teachers' experiences of assessment for learning in post-primary physical education. *Assessment in Education: Principles, Policy & Practice 17*(1), 23–39.

Majooni, A., Masood, M., & Akhavan, A. (2015). Scientific Visualizations Based on Integrated Model of Text and Picture Comprehension via Eye-tracking. *Procedia - Social And Behavioral Sciences, 176* (International Educational Technology Conference, IETC 2014, 3-5 September 2014, Chicago, IL, USA), 52-59.

Matanin, M., & Tannehill, D. (1994). Assessment and grading in physical education. *Journal of Teaching in Physical Education, 13*(4), 395–405.

Mayadas, F., Bourne, J., & Bacsich, P. (2009). Online education today. *Science, 323*(5910), 85–89.

McCurry, D. S. (2003). Democratic education with technology: Towards a theory-foundation of democratic information and communications technology practice in teacher preparation. *Education, Communication & Information, 3*(3), 417–435.

Meyer, K. (2003). Face-to-face versus threaded discussions: The role of time and higher-order thinking. *Journal of Asynchronous Learning, 7*(3), 55–65.

Mintah, J. (2003). Authentic assessment in physical education: prevalence of use and perceived impact on students' self-concept, motivation, and skill achievement." *Measurement in Physical Education and Exercise Science, 7*(3), 161–174.

Nagel, D. (2009, October 24). *Most college students to take classes online by 2014*. Campus Technology. http://campustechnology.com/articles/2009/10/28/most-college-students-to-take-classes-online-by-2014.aspx

National Student Clearinghouse Research Center. (2020, October 15). *Fall 2020 enrollment.* https://nscresearchcenter.org/stay-informed

Neuhauser, C. (2002). Learning style and effectiveness of online and face-to-face instruction. *The American Journal of Distance Education, 16*(2), 99–113.

Ní Chróinín, D., & Cosgrave, C. (2012). Implementing formative assessment in primary physical education: Teacher perspectives and experiences. *Physical Education and Sport Pedagogy, 18*(2), 219–233.

Pat El, R., Tillema, H., Segers, M., & Vedder, P. (2013). Validation of assessment for learning questionnaires for teachers and students. *British Journal of Educational Psychology, 83*(1), 98–113.

Penney, D., Brooker, R. , Hay, P. & Gillespie, L. (2009). Curriculum, pedagogy and assessment: Three message systems of schooling and dimensions of quality physical education. *Sport, Education and Society, 14*(4), 421–442.

Picciano, Anthony G. (2002). Beyond student perceptions: Issues of interaction, presence, and performance in an online course. *Journal of Asynchronous Learning, 6*(1), 21–40.

Redelius, K., & Hay, P. (2012). Student views on criterion-referenced assessment and grading in Swedish physical education. *Physical Education and Sport Pedagogy, 17*(2): 211–225.

Riebe, L., & Jackson, D. (2014). The Use of Rubrics in Benchmarking and Assessing Employability Skills. *Journal of Management Education, 38*(3), 319–344.

Sadler, D. R. (2005). Interpretations of criteria-based assessment and grading in higher education. *Assessment & Evaluation in Higher Education, 30*, 175-194.

Sadler, D. R. (2009). Indeterminancy in the use of preset criteria for assessment and grading. *Assessment & Evaluation in Higher Education, 34*, 159-179.

Sapp, D., & Simon, J. (2005). Comparing grades in online and face-to-face writing courses: Interpersonal accountability and institutional commitment. *Computers and Composition, 22*(4), 471–489.

Seidel, T., Blomberg, G., & Renkl, A. (2013). Instructional strategies for using video in teacher education. *Teaching And Teacher Education, 34,* 56-65.

Shachar, M., & Neumann, Y. (2010, June). Twenty years of research on the academic performance differences between traditional and distance learning: Summative meta-analysis and trend examination. *MERLOT Journal of Online Learning and Teaching, 6*(2). Available from http://jolt.merlot.org/vol6no2/shachar_0610.pdf

Silver, S., & Nickel, L. (2005). Are online tutorials effective? A comparison of online and classroom library instruction methods. *Research Strategies, 203*, 89-396.

Sloan Consortium. (n.d.). *Quality Framework Narrative: The 5 Pillars.* http://sloanconsortium.org/Quality_Framework_Narrative_5_pillars

Stanković, Z., Maksimović, J., & Osmanović, J. (2018). Cognitive theories and paradigmatic research posts in the function of multimedia teaching and learning. *International Journal of Cognitive Research in Science, Engineering & Education (IJCRSEE), 6*(2), 107–114.

Stiggins, R. (1999) Assessment, student confidence, and school success. *Phi Delta Kappan, 81*(3), 191–198.

Stiggins, R., Arter, J., Chappuis, J., & Chappuis, S. (2007). *Classroom Assessment for Student Learning*. New York, NY: Pearson.

Takayoshi, P., & Selfe, C. (2007). Thinking about multimodality. In Cynthia Selfe (Ed.), *Multimodal composition: Resources For Teachers* (pp. 1–12). Hampton Press.

Thorburn, M. (2007). Achieving conceptual and curriculum coherence in high-stakes school examinations in physical education. *Physical Education and Sport Pedagogy, 12*(2), 163–184.

Veal, M. (1988). Pupil assessment perceptions and practices of secondary teachers. *Journal of Teaching in Physical Education, 7*(4), 327–342.

Wang, J., & Rairigh, R. (2006). Using instructional rubrics in physical education. *Teaching Elementary Physical Education, 17*(3), 37-41.

Wiliam, D. (2011). What is assessment for learning? *Studies in Educational Evaluation, 37*(1), 3–14.

Williams, L., & Rink, J. (2003). Teacher competency using observational scoring rubrics. *Journal of Teaching in Physical Education, 22*, 533-551.

Zhu, X. (2015). Student perspectives of grading in physical education. *European Physical Education Review, 21*(4), 409–420.