Making course evaluation exercises count—a reprise

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Abstract. This paper builds on an earlier conference presentation at the West-East Institute, Harvard University in 2019. Following further critical dialogue on mass experimental online learning influenced by the COVID-19 pandemic, the now two authors sought to answer the question of how can educators make course evaluation exercises count? The objective was to assess the viability of reflective journaling as an alternative form of course evaluation. Consequently, the authors used a mixed-method approach to, firstly, analyze ordinal data collected from seventy-one (71) postgraduate engineering candidates (89% response rate) on their attitudes towards learning. Secondly, the authors analyzed the textual data on the candidates’ self- and educator-led initiatives to enrich their learning experiences. The findings revealed a paradox—the candidates hope to have gained in-depth knowledge at the end of their courses (topmost-ranked: mean = 4.704 and SD = 0.700) but do not attend most classes with questions in mind that they want to be answered (bottom-ranked: mean = 3.451 and SD = 1.072). Analysis of the textual data showed face-to-face lecture/class attendance and the overall course design as the most common student-led and educator-led approach, respectively. Finally, the authors discuss the practical and theoretical implications considering the burgeoning online education.

1. Introduction

Standards and quality assurance in higher education institutes (HEIs) drive course evaluation exercises [1]. This drive is because the actions and relationships of the diverse stakeholders involved in the administration of HEIs depend on the results of the evaluation exercises, often involving the lecturers and the students [2]. Students are co-constructors of knowledge and, as such, co-researchers of knowledge with the lecturers [3]. Also, lecturers use students’ evaluation exercises as a form of reflective practice [4]. Teaching and research are then truly complementary, which is the premise of research-informed teaching (RIT). RIT is an all-encompassing term covering a diverse range of techniques where the learner is at the center of the teaching experience [5]. However, students’ interests in course evaluation exercises have declined and become a tick-box culture, approached with a lackluster attitude. A well-documented reason for the tick-box culture is survey fatigue among the students [6]. An under-studied factor, which this present study hinges on, is the perception of the stakes of the evaluation exercises. After all, according to one of the many students who approach the course evaluation exercise as a tick-box culture, “You Guys Don’t Use It.” The culture of not using an evaluation result has persisted due to the restrictions of the standardized process of the evaluation exercise in most HEIs. Also, not using the evaluation exercise as a learning experience, especially in the form of reflective journaling. From [7], the practical participatory stake of an evaluation exercise fosters ownership and relevance while the transformative participatory stake boosts learning and change through the process. Thus,
approaching the evaluation exercise as a form of reflective journaling, as [8] and [9] support, can increase the stakes for both the students and the lecturers and cause a paradigm shift from the more prevalent tick-box culture. Student engagement practices [10] such as course evaluation exercises are crucial for the sustainability of HEIs [11] because they develop life-long learners and reflective practitioners. This study aims to answer the research question how can educators make course evaluation exercises count? The objective was to assess the viability of reflective journaling as an alternative form of course evaluation.

2. Literature review

The mode of the preceding research question is gap-spotting for an empirical need [12]. A course evaluation exercise helps to improve the quality of education because it is a form of continuing professional development that faculty can use to enhance student learning [13]. However, the standardized process of the evaluation exercise in most HEIs does not address the issues around learning stemming from course specificity and classroom diversity. Following, there is the need to change from the one-size-fits-all approach to a more inclusive approach [14], to generate reliable pieces of information for course and lecturer improvement decisions [15]. Reflective journaling makes students’ learning evident [16], develops reflective practitioners [17], and promotes the practice of research [18]. This triple benefits of reflective journaling make it a quintessential example of the bi-directional relationship between teaching and research [19] that some authors [20] have, nonetheless, quizzed. Teaching and research project's bi-directional relationship is rooted in research-informed teaching (RIT)—the conceptual framework for this study, as discussed next.

2.1. Research-informed teaching (RIT)

The conceptual framework situates a study using the necessary theoretical and empirical bases [21]. A little wonder that the conceptual framework operates by synthesizing the relevant concepts for a better understanding of the phenomenon under investigation [22]. [23] has rightly surmised RIT to be "evidence informing teacher decisions about learning." RIT underpins other concepts like research-informed design (RID) and informed learning design (ILD). RID uses population-specific empirical inquiry to create an environmental design that meets project objectives [24]. ILD, on the flip side, is a conscious design aimed at actively using the information to learn in increasingly intricate ways [25]. RIT has practical implications for the students [26] and the lecturers alike [27]. RIT drives innovation in teaching and learning [28], including in engineering education [29]. Despite RIT’s contribution to student and lecturer development, it is yet to be embraced in full by the stakeholders in HEIs. The slow uptake could be due to the effects of the more overt extrinsic motivation on the usually subtle intrinsic motivation, which is the premise of self-determination theory (SDT)—the theoretical framework for this study, as discussed next.

2.2. Self-determination theory (SDT)

The theoretical framework articulates a specific theory, supported by empirical and conceptual work about the theory [21]. Unlike the conceptual framework, the theoretical framework contains a clear concept or theory-interrelated concepts used to explain the phenomenon under investigation [22]. SDT covers the cognitive evaluation theory (CET), which presupposes that external motivation undermines intrinsic motivation; however, SDT transcends CET by distinguishing between the influence of autonomous motivation and controlled motivation [30]. SDT is an evolving theoretical framework serving different functions such as descriptive, predictive, explanatory, and interventive [31]. SDT’s thesis is that motivation influences action, based on the three psychological needs such as autonomy, competence, and relatedness. SDT thus explains the perceived stake of a course evaluation exercise as practical participatory or transformative participatory. The resultant increasing low response rate to evaluations of teaching epitomizes a self-fulfilling prophecy about the questionable relevance of the practice, in the first instance [32] with a potential negative impact on course (re)design [33]. This study uses the didactic approach of a course evaluation exercise as reflective journaling to challenge this notion on an engineering course—construction project management (CPM).
2.3. Construction project management (CPM)

Management is about putting together organizations that work to accomplish a mission [34]. Management, as a real profession, embodies accountable civic and personal responsibilities to institutions [35]. Project management and construction management are two of the narrower specialties around the main fields of management that accentuate the contextual characteristics of the management profession and follow the trends in mainstream management [36]. CPM combines project management and construction management. CPM is about managing the complexity, dynamism, and fragmentation that characterize construction projects [37]. CPM is one of the core courses for the Bachelor of Science (BSc) honors’ level construction management (CM) and quantity surveying (QS) students at most schools of construction in South Africa. With South Africa’s "3+1 system" (as of date), the BSc honors CM and QS students are either continuing with their postgraduate honor's degree at the same university or joining from another university (both for another one year), post-three-year-Bachelor's degree. The next section discusses the methodology used to investigate the reflective journalizing experience on the course CPM.

3. Methodology

The methodology is a way of thinking about research and embodies the methods and techniques used to systematically solve a problem or phenomenon under investigation [38]. The research onion is the most common model used to describe a research methodology [39]. Following the objective of this study, the authors used the pragmatic research philosophy. Pragmatism combines the idealist positivism and relativist interpretivism philosophical stances [40]. Emanating from the pragmatic research philosophy, the authors used abduction as the research approach. Abduction spans the induction approach and deduction approach [41]. This study adopted the mixed-method methodological choice, based on the quantitative and qualitative aspects, as discussed subsequently.

3.1. Research design

The authors considered the cross-sectional survey to be the most appropriate research design for this study because the intent is about obtaining a snapshot of opinion for a given time as against establishing a trend over time [42]. A cross-sectional design focuses on the dominance of the phenomenon of interest for the selected timeframe, hence its inherent advantages and disadvantages of the cross-sectional study [43]. Surveys and interviews could be a limitation due to the potential effects of factors such as social desirability bias, halo and leniency effects, and nonconscious activation [44], including restrictions for comparative purposes [45]. Nonetheless, surveys and interviews are still the most common forms of research design among organizational researchers due to their ability to generate a lot of data within the available resources and the representativeness of the sample that provided the data [46].

3.2. Research method

A four-section, web-based, and semi-structured questionnaire aided the collection of quantitative and qualitative data from the target population (explained in detail under the next section) to allow for respondents' anonymity and response flexibility and the authors' ease of data management [47]. The first section sought data on the profile of the respondents. The second section required quantitative ordinal data on the level of agreement on ten attitudes towards studying from 1 (strongly disagree) to 5 (strongly agree). The authors adapted the list of attitudes from a study process questionnaire [48]. The third section gathered qualitative data on what the students have, and could have done particularly well to enrich their learning experiences on the course CPM. The last part sought qualitative data on what the course coordinator had or could have done particularly well to enrich the students' experience on the course. Combining quantitative and qualitative data allows for methodological triangulation, for a more accurate and reliable result than a purely quantitative or qualitative method [49].

3.3. Population and sampling

From a target population of B.Sc. honor's level CM and QS students in South Africa, the authors purposively sampled CM and QS students who have completed the course CPM at a university in South Africa, using the course forum register as a sampling frame. Out of the eighty (80) students sampled,
seventy-one (71) responded—sixty-five (65) on-campus and six (6) off-campus to give a total of 89% response rate. This response rate was higher than the average of 54% response rate achieved through paper-based course evaluation exercises in the preceding four years to the online mode. Adopting the online/web-based format also allowed discussing the results with the students during the last lecture session, including clarifying the knotty/misconstrued concepts and advising the students on the study approach for the final examination.

4. Results and discussions

Figure 1 presents the profile of the 71 respondents from the first section of the questionnaire. The construction industry is still male-dominated [50] and, at best, unappealing to the female workforce [51]. More students in South Africa do specialize in QS than CM due to the purported better job satisfaction [52]. This preference explains the sustained effort to uphold the QS profession’s status [53]. Also, the majority of students continue with their B.Sc. honors degree at the same university, while other students join from other universities based on different factors [54]. Lastly, about one-third of the class was combining work and study, attesting to the growing number of working learners [55].

![Figure 1. Respondents’ profile](image)

4.1. Studying attitudes

Table 1 presents the mean (M), standard deviation (SD), coefficient of variation (CV), and z-score (Z) of the quantitative ordinal data on the level of agreement with ten attitudes towards studying, from the second section of the questionnaire. M was used to rank the attitudes while SD expresses variability, which CV, obtained by dividing SD by M, helps to interpret better. Z is the number of SDs from M, also referred to as the normal deviate [56]. The authors computed the values for Z for each attitude using the following formula from [57]:

\[ Z = \frac{M - 4}{SD} \]  

(1)
Table 1. Attitudes towards studying

| Attitude                                                                 | M     | SD    | CV   | Z      | Rank |
|--------------------------------------------------------------------------|-------|-------|------|--------|------|
| I hope to have gained a broader and deeper knowledge when I have completed my courses. | 4.704 | 0.700 | 0.149| 1.006  | 1    |
| I need to understand the content of my courses as thoroughly as possible. | 4.493 | 0.962 | 0.214| 0.512  | 2    |
| My fear of performing poorly often motivates me.                          | 4.296 | 1.106 | 0.257| 0.268  | 3    |
| I prefer material that arouses my curiosity even if it is hard to learn. | 4.282 | 0.922 | 0.215| 0.523  | 4    |
| I prefer a course that challenges me so I can learn new things.           | 4.169 | 1.007 | 0.242| 0.168  | 5    |
| I feel that virtually any topic can be highly interesting once I get to it.| 3.915 | 0.946 | 0.242| -0.090 | 6    |
| I find that, at times, studying gives me a feeling of deep personal satisfaction. | 3.859 | 1.052 | 0.273| -0.134 | 7    |
| I work hard at my studies because I find the material interesting.       | 3.648 | 1.102 | 0.302| -0.319 | 8    |
| I find that studying academic topics can, at times, be as exciting as a good novel or movie. | 3.486 | 1.041 | 0.299| -0.494 | 9    |
| I attend most classes with questions in mind that I want answers.        | 3.451 | 1.072 | 0.311| -0.512 | 10   |

Table 2 presents the binary distribution of the attitudes that ranked first and last. As a binary distribution, it becomes necessary to measure the frequency of those who rated the topmost and most bottom attitudes 4 or 5 to identify where the majority appeared. A more than 50% distribution, on either side, constituted the majority in a binary distribution. Hence, a win—similar to tossing a coin for a head or a tail.

Table 2. Binary distribution (topmost and most bottom-ranked attitudes)

| Criteria                                      | Gender | Degree Specialty | Pre-Honors University | Studying and Working |
|-----------------------------------------------|--------|------------------|-----------------------|----------------------|
| Distribution n                               | Male (n = 42) | Female (n = 29) | QS (n = 49) | CM (n = 22) | Same (n = 63) | Different (n = 8) | No (n = 48) | Yes (n = 23) |
| Rated the topmost 4 or 5                     | 40     | 28               | 48                    | 20                   | 61               | 7               | 47         | 21         |
| Expressed as a %                             | 95.24% | 96.55%           | 97.96%                | 90.91%               | 96.83%           | 87.50%          | 97.92%     | 91.30%     |
| Rated the bottommost 4 or 5                  | 23     | 14               | 27                    | 10                   | 31               | 6               | 29         | 8          |
| Expressed as a %                             | 54.76% | 48.28%           | 55.10%                | 45.45%               | 49.21%           | 75.00%          | 60.42%     | 34.78%     |

Out of the sixteen possible outcomes or trials, eight each under the topmost- and bottommost-ranked attitudes, twelve cases showed a greater than 50% distribution, which translated to a grand 75% (i.e., 12/16) agreement across gender, degree specialty, pre-honors university, and combining work and study. The authors noted that 75 percent agreement in categorical data is substantial [58]. The authors also performed a binomial test by computing the probability (p) of obtaining x in n trials using the following binomial distribution:

$$P(x) = \sum_{x=0}^{n} \binom{n}{x} p^x q^{n-x}, \quad \text{where} \quad \binom{n}{x} = \frac{n!}{x!(n-x)!}$$

(2)
The null hypothesis ($H_0$) upheld that the outcome had occurred by chance. Ideally, the probability ($p$) of obtaining a greater than 50% and a less than 50% distribution should both be 0.05. Consequently, the probability of an outcome of a total of twelve cases more than 50% distributions in sixteen trials is given by:

$$P(12) = \binom{16}{12} 0.5^{12} 0.5^4 = \frac{16!}{12!4!} (0.5)^{16} = 1820 (0.5^{16}) = 0.028$$

Since the 0.028 value (i.e., test statistic) obtained is less than 0.05 at the 95% confidence level for a binomial test, the authors rejected the null hypothesis as the evidence suggested that the outcome had not occurred by chance.

4.2. Self-initiated approach

The online software TagCrowd (https://tagcrowd.com) aided the qualitative content analysis of the data obtained through the third section of the questionnaire on what the students have and could have done particularly well to enrich their learning experiences on the course, based on the following steps:

1. Pasting the entire textual responses in the visualization box on TagCrowd;
2. Selecting from the default options: (a) the maximum number of 50 words to show; (b) words of the minimum frequency of 5 to show; (c) selecting "yes" to show frequencies; and (d) indicating not to show some words inevitable (e.g., work, lecturer);
3. Clicking visualize!

Figures 2 and 3 show the results of the analyses of the students' reflection on what they have and could have done particularly well, respectively, for a better learning experience, with the corresponding themes and frequencies. The most frequently occurring idea from Figure 2 on the students' reflection on what they have done particularly well is "lecture." As [59] recommended, the following quote is the most representative of the findings from Figure 2:

"I do not attend classes for certain courses because I feel the lecture is trivial as the lecturer would be reading from the slides. I have tried to attend as many lectures as possible for this course. Whenever we have an assignment, I would look up the topic on academic websites when I felt that the slides provided by the lecturer were not enough."— Female QS student from the same university, who was not combining work and study and was neutral about attending most classes with questions in mind to be answered.

The most frequently occurring theme from Figure 3 on the students' reflection on what they could have done particularly well is "lectures." Following is the most representative quote on the findings from Figure 3, which, together with the earlier reflection on what the students have done particularly well, further distilled the increasing discussions on dwindling class or lecture attendance [60]:

"I could have studied harder, prepared for lectures, and asked more questions in class to engage with the content."— Female CM student from the same university, who was combining work and study and somewhat disagreed with attending most classes with questions in mind to be answered.
4.3. Lecturer-led approach

Figures 4 and 5 show the results of the analyses of the students' reflection on what the lecturer has and could have done particularly well, respectively, for a better learning experience, with the associated themes and frequencies. The most frequently occurring idea from Figure 4 on the students' reflection on what the lecturer has done particularly well is "course" as supported by the following most representative quote:

“I think the thing that stood out was the design of the course timetable. The lecturer has given us time to complete submissions and to meet in our groups where necessary, which has eased the burden of learning. With the reduced class times, we were able to work harder at accomplishing our group tasks.” — Female CM student from the same university, who was not combining work and study and somewhat disagreed with attending most classes with questions in mind to be answered.
The most frequently occurring theme from Figure 5 on the students’ reflection on what the lecturer could have done particularly well is “test” as supported by the following most representative quotes:

“I feel like the lecturer should have given us two tests based on all the topics so that we can be more familiar with how the structure of the remaining test and exam.”—Male QS student from the same university, who was not combining work and study and somewhat agreed with attending most classes with questions in mind to be answered.

“Set one assignment which will be very similar to the test.”—Male CM student from the same university, who was not combining work and study and somewhat agreed with attending most classes with questions in mind to be answered.

4.4. Critically reflecting on the response

The responses on what the lecturer could have done particularly well did echoed test anxiety, which is a common phenomenon among students [61, 62], linked to academic self-concept [63] and academic performance [64]. Most students have survived on rote learning to the extent that they have not
developed their metacognitive skills [65]. Unlike what the students were used to, their reflections on the course CPM revealed the following representative quotes:

"encouraged the merging of all our courses, thus not seeing them as individual courses, but rather as 'a body made of different parts'"—Female QS student from another university, who was not combining work and study and strongly agreed with attending most classes with questions in mind to be answered.

"The lecturer has stimulated my thinking out of the box. Being able to come up with my ideas and not only relying on literature."—Male QS student from the same university, who was combining work and study and neutral about attending most classes with questions in mind to be answered.

"practical thinking has improved because I learned that this course is not theory-regurgitating but more on understanding what would occur in a true working environment."—Male CM student from the same university, who was combining work and study and strongly agreed with attending most classes with questions in mind to be answered.

"I've put in extra effort in everything I do in this course. I've been able to think on my feet to solve problems and apply critical thinking to most problems."—Female QS student from another university, who was not combining work and study and somewhat agreed with attending most classes with questions in mind to be answered.

These responses support SDT’s thesis that motivation influences action based on the three psychological needs: autonomy, competence, and relatedness. The students' reflection on self-motivated lecture attendance, competence-development in independent thinking, and relating concepts to practical examples validated the relevance of SDT. This critical thinking leading to self-examination on the part of the students was possible because the course coordinator approached the evaluation exercise as a reflective journaling experience, based on the research-informed teaching (RIT) conceptual framework. RIT can be research-led, research-oriented, research-based, and research-informed [66]. This study lends toward teaching as a research-based activity. The rhetorical question remains if there is a corresponding increase in class performance as a result of the reflective journaling experience. On one end, the 89% response rate to the online course evaluation exercise, approached as a reflective journaling practice, was higher than the average of 54% response rate achieved through paper-based course evaluation exercises in the preceding four years. At the other end, the class average mark was 62% as compared to the 64% class average mark of the preceding four years. A plausible explanation is the nuanced nature of learning [67] and, as a result, the need to treat reflective journaling as a discrete assessment task [68]. The journaling can be in the form of an e-portfolio [69] to make evident the other forms of learning, for assessment and to contribute to the overall course performance. Consequently, this would raise the practical and transformative participatory stakes of the evaluation exercise [7] and cause a paradigm shift from the more prevalent tick-box culture—making it count, and answering the research question posed earlier in this paper.

5. Conclusion
The prevalent standardized course evaluation exercise in most HEIs does not allow for the unique nature of each course in the design of the evaluation exercise. The argument in favor of standardized evaluation exercises is quality assurance. However, in the absence of dwindling interests in course evaluation exercises both among the students and the lecturers alike, it is time to challenge the one-size-fits-all approach to adopt other alternatives for sustainability in HEIs. This study explored the potentials of a course evaluation exercise as a reflective journaling experience to improve the practical and transformative participatory stakes. The findings showed that reflective journaling is a valid alternative form of course evaluation. Admittedly, the context of the sampled population and the sample size restricted the generalizability of these findings. Still, as practical implications, students' studying attitudes present a paradox—students hope to have gained a broader and deeper knowledge upon completion of their courses but not necessarily attend most classes with questions in mind that they need answers. Students still physically attend some lectures that they perceive to be of value as it provides
them the opportunities to engage with the lecturer and clarify the pre-read material. With this being the case, lecturers should design their courses to allow for some “white space” with no contact time to allow for the students to “catch-up” and reflect on the concepts already covered, as a firm foundation to build upon in the subsequent lectures. Also, the idea of the white space accords well with individual and group regulation to allow for social connection—a growth strategy in the face of the current COVID-19-pandemic-influenced wide-spreading remote learning [70]. Hopefully, the self-regulation strategy will also minimize test anxiety by maximizing the white space for guided online tutorial practice exercises—a form of inclusive education for optimal online learning to accommodate the diverse needs of learners [71]. The theoretical implications include the need for research-teaching nexus to be embraced fully under the scholarship of teaching and learning, away from the prevalent research-teaching divide. Educators should explore evaluation exercises using one or a combination of the research-teaching nexus (i.e., research-led, research-oriented, research-based, and research-informed) to validate a best-fit design approach for their courses and programs. The exploration will allow accommodating the different contexts without compromising the learning objectives and outcomes. By so doing, an evaluation exercise will become a reflective journaling experience for both the students and the lecturers, and, in so doing, make course evaluation exercises count.

6. References
[1] Agasisti T, Barbato G, Dal Molin M and Turri M 2019 International quality assurance in universities: does NPM matter? Studies in Higher Education 44 960–77
[2] Labanauski R and Ginevičius R 2017 Role of stakeholders leading to development of higher education services Engineering Management in Production and Services 9 63–75
[3] Bellinger A, Bullen D and Ford D 2014 Practice research in practice learning: students as co-researchers and co-constructors of knowledge Nordic Social Work Research 4 58–69
[4] Winchester T M and Winchester M K 2014 A longitudinal investigation of the impact of faculty reflective practices on students’ evaluations of teaching British Journal of Educational Technology 45 112–24
[5] Nicholson A 2017 Research-informed teaching: a clinical approach The Law Teacher 51 40–55
[6] Porter S R, Whitcomb M E and Weitzer W H 2004 Multiple surveys of students and survey fatigue New Directions for Institutional Research 121 63–73.
[7] Plottu B and Plottu E 2009 Approaches to participation in evaluation: some conditions for implementation Evaluation 15 343–59
[8] Dunlap J C 2006 Using guided reflective journaling activities to capture students’ changing perceptions TechTrends 50 20–26
[9] Hubbs D L and Brand C F 2005 The paper mirror: understanding reflective journaling Journal of Experiential Education 28 60–71
[10] Robinson C 2012 Student engagement: what does this mean in practice in the context of higher education institutions? Journal of Applied Research in Higher Education 4 94–108
[11] Figueiró P S and Raufflet E 2015 Sustainability in higher education: a systematic review with focus on management education Journal of Cleaner Production 106 22–33
[12] Hällgren M 2012 The construction of research questions in project management International Journal of Project Management 30 804–16
[13] Kennedy, M.M., 2016. How does professional development improve teaching? Review of Educational Research, 86(4), pp.945-980
[14] Hill H and Grossman P 2013 Learning from teacher observations: challenges, and opportunities posed by new teacher evaluation systems Harvard Educational Review 83 371–84
[15] Martinez F, Taut S and Schaaf K 2016 Classroom observation for evaluating and improving teaching: an international perspective Studies in Educational Evaluation 49 15–29
[16] Cheng M W and Chan C K 2019 An experimental test: using rubrics for reflective writing to develop reflection Studies in Educational Evaluation 61 176–182
[17] Forester J, Kuitenbrouwer M and Laws D 2019 Enacting reflective and deliberative practices in action research Policy Studies 40 456–75
[18] Banks-Wallace J 2008 Eureka! I finally get it: journaling as a tool for promoting praxis in research *The ABNF Journal* **19** 24–7
[19] Lingard B and Renshaw P 2013 Teaching as a research-informed and research-informing profession *Connecting inquiry and professional learning in education* (London: Routledge) pp 40–53
[20] Hancock P, Marriott N and Duff A 2019 Research-teaching yin-yang? An empirical study of accounting and finance academics in Australia and New Zealand *Accounting and Finance* **59** 219–52
[21] Rocco T S and Plakhotnik M S 2009 Literature reviews, conceptual frameworks, and theoretical frameworks: terms, functions, and distinctions *Human Resource Development Review* **8** 120–30
[22] Imenda S 2014 Is there a conceptual difference between theoretical and conceptual frameworks? *Journal of Social Sciences* **38** 185–95
[23] Stinson M 2019 Research-informed teaching and drama: curating the evidence *NJ: Drama Australia Journal* **43** 1–3
[24] Peavey E and Vander Wyst K B 2017 Evidence-based design and research-informed design: What’s the difference? Conceptual definitions and comparative analysis *Health Environments Research & Design Journal* **10** 143–56
[25] Maybee C, Bruce C S, Lupton M and Pang M F 2019 Informed learning design: Teaching and learning through engagement with information *Higher Education Research & Development* **38** 579–93
[26] Bencze L, Erin S and Lyn C 2012 Students’ research-informed socio-scientific activism: Re/visions for a sustainable future *Research in Science Education* **42** 129–48
[27] Irving-Bell D 2019 Dynamic lecturing: research-based strategies to enhance lecture effectiveness *Innovations in Education and Teaching International* **56** 251–3
[28] Bage G 2019 Lessons and lacunae? Practitioners’ suggestions for developing research-rich teaching and learning: Angles on innovation and change *Innovations in Education and Teaching International* **56** 150–61
[29] Boubou G M, Offor I T and Bappa A S 2017 Why research-informed teaching in engineering education? A review of the evidence *European Journal of Engineering Education* **42** 323–35
[30] Gagné M and Deci E L 2005 Self-determination theory and work motivation *Journal of Organizational Behavior* **26** 331–62
[31] Ryan R M, Soenens B. and Vanteenkiste M 2019 Becoming who you are: An integrative review of self-determination theory and personality systems interactions theory *Journal of Personality* **87** 15–36
[32] Hoel A and Dahl T I 2019 Why bother? Student motivation to participate in student evaluations of teaching *Assessment & Evaluation in Higher Education* **44** 361–78
[33] Kregel I 2019 Kaizen in university teaching: continuous course improvement *International Journal of Lean Six Sigma* **10** 975–91
[34] Magretta J 2012 What management is – how it works and why it’s everyone’s business (New York: Free Press)
[35] Khurana R and Nohria N 2008 It’s time to make management a true profession *Harvard Business Review* **86** 70–77
[36] Koskela L 2017 Why is management research irrelevant? *Construction Management and Economics* **35** 4–23
[37] Kereri J O and Harper C M 2019 Social networks and construction teams: Literature review *Journal of Construction Engineering and Management* **145** 03119001
[38] Kothari C R 2004 *Research methodology: Methods and techniques* (India: New Age International)
[39] Holden M T and Lynch P 2004 Choosing the appropriate methodology: Understanding research philosophy *The Marketing Review* **4** 397–409
[40] Powell T C 2019 Can quantitative research solve social problems? Pragmatism and the ethics of social research *Journal of Business Ethics* **June** 1–8
[41] Olsen J and Gjerding A 2019 Modalities of abduction: a philosophy of science-based investigation of abduction Human Arenas 2 129–52
[42] Rindfleisch A, Malter A J, Ganasen S and Moorman C 2008 Cross-sectional versus longitudinal survey research: Concepts, findings, and guidelines Journal of Marketing Research 45 261–79
[43] Sedgwick P 2014 Cross-sectional studies: advantages and disadvantages. BMJ 348 g2276
[44] Meißner M and Oll J 2019 The promise of eye-tracking methodology in organizational research: A taxonomy, review, and future avenues Organizational Research Methods 22 590–617
[45] Goerres A, Siewert M B and Wagemann C 2019. Internationally comparative research designs in the social sciences: Fundamental issues, case selection logics, and research limitations KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie 71 75–97
[46] Kelley K, Clark B, Brown V and Sitzia J 2003 Good practice in the conduct and reporting of survey research International Journal for Quality in Health Care 15 261–66
[47] Newman J C, Des Jarlais D C, Turner C F, Gribble J, Cooley P and Paone D 2002 The differential effects of face-to-face and computer interview modes American Journal of Public Health 92 294–7
[48] Biggs J, Kember D and Leung D Y P 2001 The revised two-factor study process questionnaire: R-SPQ-2F British Journal of Educational Psychology 71 133–49
[49] Heesen R 2019 Vindicating methodological triangulation Synthese 196 3067–81
[50] Ness K 2012 Constructing masculinity in the building trades: ‘Most jobs in the construction industry can be done by women’ Gender, Work & Organization 19 654–76
[51] Sang K and Powell A 2013. Equality, diversity, inclusion and work-life balance in construction Human resource management in construction: Critical perspectives (London: Routledge) pp 187–220
[52] Bowen P, Cattell K, Distiller G and Edwards P J 2008 Job satisfaction of South African quantity surveyors Engineering, Construction and Architectural Management 15 260–69
[53] Othman A A E 2012 An innovative protocol for improving the ethical behavior of the quantity surveying profession in South Africa International Journal of Construction Management 12 43–62
[54] Tobolowsky B and Bers T 2019 Stops, starts, and detours: Transfer students’ college choice process Community College Journal of Research and Practice 43 573–84
[55] Clark H, Jassal P K, Kyte S B and LeFebvre M 2019 The new learning economy and the rise of the working learner The Wiley handbook of global workplace learning (USA: Wiley & Sons, Inc.) pp.67–81
[56] Colan S D 2013 The why and how of Z scores Journal of the American Society of Echocardiography 26 38–40
[57] Sauro J 2011 How to interpret survey responses: 5 techniques (https://measuringu.com/interpret-responses/)
[58] Landis J R and Koch G G 1977 The measurement of observer agreement for categorical data Biometrics 33 159–74
[59] Anderson C 2010 Presenting and evaluating qualitative research American Journal of Pharmaceutical Education 74 141
[60] James T and Seary K 2019 Why aren’t they attending class like they are supposed to? A review into students’ perception of the value of class attendance Student Success 10 115–29
[61] Spielberger C D 2010 Test anxiety inventory The Corsini Encyclopedia of Psychology 1 1
[62] Zeidner M 2010 Test anxiety The Corsini Encyclopedia of Psychology 1 3
[63] Desideri L, Ottaviani C, Cecchetto C and Bonifacci P 2019 Mind wandering, together with test anxiety and self-efficacy, predicts student’s academic self-concept but not reading comprehension skills British Journal of Educational Psychology 89 307–23
[64] Özgan E and Karakılıç H F 2019 The relationship between test anxiety and academic performance Electronic International Journal of Education, Arts, and Science (EIJEAS) 4 1–12
[65] Radmehr F and Drake M 2019 Revised Bloom’s taxonomy and major theories and frameworks that influence the teaching, learning, and assessment of mathematics: a comparison International Journal of Mathematical Education in Science and Technology 50 895–920

[66] Griffith R 2004 Knowledge production in the research-teaching nexus: the case of the built environment disciplines Studies in Higher Education 29 709–26

[67] Swaffield S 2011 Getting to the heart of authentic assessment for learning Assessment in Education: Principles, Policy & Practice 18 433–49

[68] Hampton S E and Morrow C 2003 Reflective journaling and assessment Journal of Professional Issues in Engineering Education and Practice 129 186–9

[69] Dwyer K K and Davidson M 2019 E-journaling for all communication classes Communication Teacher 34 191–7

[70] MacMahon S, Leggett J and Carroll A 2020 Promoting individual and group regulation through social connection: strategies for remote learning Information and Learning Sciences 121 343–53

[71] Thompson, K M and Copeland C 2020 Inclusive considerations for optimal online learning in times of disasters and crises Preprint https://doi.org/10.1108/ILS-04-2020-0083