PACIFIC RIM PROPERTY RESEARCH JOURNAL
2021, VOL. 27, NO. 2, 127–144
https://doi.org/10.1080/14445921.2021.1983925

Routledge
Taylor & Francis Group

RESEARCH ARTICLE



# The structured learning of valuation modelling

Steven Boyd

School of Business and Law, CQUniversity, Australia

**ABSTRACT**

Active learning compels non-academic students to employ deeper learning strategies. Unfortunately, established activities to encourage active learning are resource intensive and do not suit physically distanced modes of delivery. This research presents an active learning module and proposes a novel structured approach to enhance the learning and teaching of financial modelling in property education, during and after COVID-19.

A review of past research presents ways to encourage deeper learning. This research is primarily based on findings from published property education research. It builds on that knowledge as it shares the design of Valuation Modelling online module and the application of Petronzi and Petronzi's (2020) Online and Campus (OaC) model, as a response to COVID-19.

The OaC model is adapted to bring forward an applied learning activity, the development of a working valuation spreadsheet. The result is higher education unit, or subject, with an Apply, Evaluate, and Solve (AES) structure that aligns with academic frameworks, and has the potential to accommodate case-based and problem-based learning activities with less reliance on human resources. The Valuation Modelling module and its incorporation into an AES framed unit of study are demonstrated as contributions of this research.

**ARTICLE HISTORY**
Received 21 July 2021
Accepted 18 September 2021

**KEYWORDS**
Valuation modelling; property education; real estate education; active learning; COVID-19; problem-based learning; case-based learning

## Introduction

The COVID-19 pandemic and era present a challenge for society, impacting the way we live, the way we engage, and the way we learn. This challenge has led to a reconsideration of the built environment, the way we use existing buildings and the highest and best use for future property developments. Decisions driven by past iterative processes have, at times, been put aside as leaders in commercial property employ deeper cognitive processes to interpret information and set strategies to create opportunity from emerging problems.

Enhancing the decision-making of future leaders in property is the study area for this research. The paper commences with a review of previously published research, bringing together previous academic and practical research findings as a foundation for the research. Specifically, the review commences with a focus on how to encourage deeper learning in

**CONTACT** Steven Boyd s.boyd@cqu.edu.au

property students. It is the findings of this review that inform the design of the online learning module, Valuation Modelling, commissioned by the Australian Property Institute (API).

The final part of the paper considers how the module is best incorporated in higher education. Through adaptation of the Petronzi and Petronzi (2020) Online and Campus (OaC) model, a Valuation Modelling subject, or unit, is presented as an example how synchronous and asynchronous learning activities may be coordinated to provide the benefit of case-based and problem-based learning during the COVID-19 endemic.

## Review of previous research

The review addresses what has been done previously, and what insights may be gained to enhance the decision-making of future leaders in property. It commences with a focus on how to encourage deeper learning in property education.

### *Encouraging deeper learning*

The study of learning has been the subject of research by psychologists, with theories of human knowledge construction shared and contested. While acknowledging the relationship between the cognitive theories of phenomenography and constructivism and the focus on student learning, Biggs (1993) criticises much of the earlier research as he considered the approach of the psychologists to be too centered on uncovering a single grand theory. Rather, Biggs (1993) and Biggs and Tang (2009, 2011) believe learning to be context situated and student centric, attributing the advancement of the "student learning" field of study to Marton and Saljo (1976a, 1976b) and their studies of surface and deep approaches to learning.

According to Marton and Saljo (1976a), there are two distinguishable levels of processing in learning: a surface level and a deep level. In surface level processing, the student directs their attention towards learning the knowledge verbatim and, as a result, the student is encouraged to employ a rote-learning strategy. Deep-level processing sees the student look beyond the text itself towards the material and what is signified (Biggs & Tang, 2009, 2011). Through testing deep and surface learning, Marton and Saljo (1976b) found that deep processing was more conducive to longer-term knowledge retention.

Students, by their very nature, are said to be more inclined to adopt either surface or deep learning strategies in higher education (Biggs, 1999; Biggs & Tang, 2009, 2011; Marton & Saljo, 1976b). According to Biggs (1999), students who adopt deep approaches to learning virtually teach themselves. The deeper learners are said to be autonomous and compatible with the current and emerging form of higher education (Biggs & Tang, 2009, 2011).

While a particular student may be more inclined to adopt one learning strategy over another, through experimentation Marton and Saljo (1976b) discovered that students will adapt their use of surface or deep strategies depending on the perceived expectation of the teacher or assessor. Specifically, they note

> While many students are apparently capable of using 'deep' or 'surface' strategies, it may be that the current demands of the examination system at school level are interpreted by them as requiring mainly the recall of factual information to the detriment of a deeper level of understanding. (Marton & Saljo, 1976b, p. 125)

In sharing the findings of Marton and Biggs and Tang (2009, 2011) contrast two teaching methods – passive lectures and active problem-based learning – against the cognitive activities for two students: a stereotypical academic "Susan" and non-academic "Robert". Susan, by their definition, is academically committed, taking interest in her studies, and virtually teaching herself. Conversely, Robert is said to be at university primarily to obtain the qualification, wanting only to put in sufficient effort to pass.

By moving away from passive lecture-based activities to active learning, such as case-based and problem-based, Biggs and Tang (2009, 2011) argue that non-academics employ a higher-level cognitive activity, making Robert learn like Susan. While not universal in its adoption, the Biggs and Tang (2009, 2011) perspective of good teaching, as "getting most students to use the level of cognitive processes needed to achieve the intended outcomes that more academic students use spontaneously" (Biggs & Tang, 2011, p. 7), presents a foundation for advancing property education during and after COVID-19.

## *Education theories and models*

Phenomenography and constructivism are theories of teaching that are well suited to this study and the Biggs and Tang (2009, 2011) definition of good teaching.

Phenomenography has its origin in clinical psychology, being used by Sonnemann in 1954, and subsequently resurrected by Marton, following his studies with Saljo (Biggs & Tang, 2009, 2011). In the context of student learning, phenomenography refers to the idea that the learner's perspective determines what is learned, which is not necessarily what the teacher intends should be learned.

Constructivism, as adopted in this paper, underlines the idea that knowledge is not transmitted to the student, but rather is constructed through activity or social interaction (Biggs & Tang, 2009, 2011; Vos, van der Meijden, & Denessen, 2011). Rather, as constructivists warn, knowledge that is "transmitted may not be the knowledge that is constructed by the learner" (Jonassen, 1991, p. 12). As such, there is an implied necessity for constructivist teaching and learning practitioners to plan learning activities and make clear the intended outcomes, in an outcomes-based approach. John Biggs' constructive alignment (Biggs & Tang, 2009, 2011) is the preeminent approach to outcomes-based education in Australian university education, including property education.

## *Active learning in property education*

The theories of phenomenography and constructivism are inferred from property research when discussing case-based and experiential learning, with a focus on context over content. Case-based studies and experiential learning have a rich history with McGrath et al. (2020) attributing Weimer (1956) as the first to argue that case studies based on current property problems of current executives should be used in teaching. In discussing the future of property education, McGrath et al. (2020) encourage the

adoption of experiential learning approaches and methods such as challenge-driven learning. The challenge-drive model they refer to applies existing knowledge to open-ended problems, as found in real market situations. According to the authors, "... challenge-driven problem solving enables students to utilise knowledge gained in the classroom via more traditional approaches, and apply it to the real-life challenges that will require them to create, invent, and develop new ideas, approaches, and solutions" (p.46).

In related pedagogical investigations, Boyd (2005), Susilawati and Yam (2013), and Palm and Pauli (2018) propose integrated problem-based workshops and other industry linked training opportunities as modes to provide a more effective learning environment for property students. In their research, Susilawati and Yam (2013) investigate the potential for case-based learning through the analysis of feedback from stakeholders in an international case competition. They conclude there is sufficient feedback to assert that the case competition: "helped students to develop critical thinking skills, and the ability to solve problems in a changing environment within a group dynamic" (Susilawati & Yam, 2013, p. 7). In Charles's (2016) evaluation of a North American case-competition she found students considered the competition to be a valuable learning experience with one student saying, "the competition offered the time to 'dive deep' into a problem" (p.170).

Palm and Pauli (2018) identify a series of learning benefits in the review of a case-based property development subject. The subject of their study incorporates a "live" real property with guest speakers from industry employed to assist with student enquiry. The student evaluations are said to support the position that the project work is relevant, and that the activity contributes to the students' higher-order thinking. The authors propose that the searching, analysing, and synthesising of information inherent in the case-based learning, imply a "higher-order learning outcome from the students" (Palm & Pauli, 2018, p. 73).

Both Susilawati and Yam (2013) and Palm and Pauli (2018) make explicit connections to Biggs and Tang (2009) concepts of active learning and the potential to engage students in adopting a deeper approach to their learning. Formative feedback from students in the Urban Land Institute (ULI) Hines Student Competition provides support for Charles's (2016) assertion that the competition contributes to the students' development of a holistic, tacit knowledge of property development. While still positive, she says, the ULI case-based competition did not have a profound impact on students perceived learning of financial analysis/modelling. On a scale from 1 (nothing at all) to 5 (a lot), 83% chose between 2 and 4 as a measure of "how much [they] learned during the competition (relative to what you knew at the start of the competition)" (Charles, 2016, p. 162).

Case-based and problem-based learning approaches, as applied in property education, are not without limitations. In the Palm and Pauli (2018) study, the learning and teaching approach was resource intensive and relied heavily on the selection and performance of the industry participants. They also identify risks associated with engaging with industry, including the potential for a focus shift toward teaching "practicalities" over theoretical knowledge. Boyd (2015) identified a similar gap between academics and practitioners in the findings from their Delphi analysis, where academics were said to place a higher importance on engaging students in higher-order cognition exercises.

Susilawati and Yam (2013) acknowledge problem-based learning as labor intensive and their description of the analysed case study demonstrates the considerable financial cost and resourcing required to enable relatively few students to receive the perceived pedagogical advantages. The authors note that only three universities had participated in all four case competitions and that participation was always subject to funding and the availability of a coach or mentor. As a further limitation, the nature of the event, being a competition or opportunity for trans-university rivalry, may add emotive stimulation but also bias with respect to the team selection. In such a competition, it is conceivable that contestant selection may be based on prior academic performance and benefit the "haves" over the "have-nots". This appears to conflict with the Biggs and Tang (2009, 2011) focus quality teaching and developing the non-academic student.

### *Assessable active learning*

As asserted by Biggs and Tang (2009, 2011) active learning, through problem-based learning activities, compels non-academic students to employ higher-level cognitive activity, making them learn more like their academic counterparts. In turn, this less passive approach is said to lead to enhanced learning and good teaching.

The problem with these learning and teaching approaches is that they are resource intensive and rely heavily on the selection and performance of the industry participant. With the pandemic necessitating physical distancing, engaging with industry is made more difficult. If more active approaches to learning are adopted, then new strategies will be required to utilise resources more efficiently or even simulate much of the role previously performed by the industry participant.

Through simulation and resource cutting, there is a substantial risk that a designed activity will lose the authenticity and depth of enquiry inherent in the Palm and Pauli (2018) study. When considered in the context of learning valuation methods, there are further risks associated with streamlining case-based learning. In the Palm and Pauli (2018) study, the students develop their own discounted cash flow (DCF) model. A way to streamline such an activity may be to have the students utilise an industry developed model or tool. Such an approach may even be supported by industry stakeholders that are calling for practice ready students, proficient in the use of industry tools (Australian Property Institute (API), 2021, Azasu & Gibler, 2016). That said, there would be a loss of deeper understanding of analysis and shift in focus shift toward teaching what Palm and Pauli (2018) refer to as practicalities rather than engaging in deeper, more theoretical knowledge. Wilkinson, Halvitigala, and Antoniades (2018) make similar distinctions as they discuss the future of property education and technological interventions, contrasting training and education as:

> . . . training involves learning how to use a technology or software, whereas education provides a deeper understanding of fundamental theories and the ability to question and continuously learn, evolve and develop deeper understanding over time. It should be the case that universities retain this education role and do not become training [centers]. (Wilkinson et al., 2018, p. 397)

In analysing South African property curriculum, Mooya (2015) is critical of the "how-to" philosophy of vocational education being prescriptively applied to the learning of valuation methodology. Specifically, he suggests that, by aligning each property type with a valuation approach, there is a loss of broad conceptual knowledge that should be the hallmark of university education (Mooya, 2015).

### Valuation modelling module

The review of previous research identifies themes and gaps in the current published research and presents justification, or support, for the development of a new case-based learning activity. One that requires students to build their own DCF encourages a deeper level of understanding of valuation modelling but does not require the expansive resources or physical engagement in industry participants to deliver.

An online learning and teaching module, Valuation Modelling was commissioned by the Australian Property Institute (API) to fill a knowledge gap identified in a review of the institute's education program. The APIs education program has a practical training focus, set to ensure valuation applicants are "prepared to transition from student to professional Valuer" (Australian Property Institute (API), 2021). The completed module is available on the institute's portal, presenting in a traditional and uniform, "read and assess" framework, with embedded images and videos.

The module was designed to be active, to enhance students' understanding and application of valuation modelling for investment and development properties. To do this, it was structured as a case-based learning activity, with an intended bias toward education rather than training (Palm & Pauli, 2018; Mooya, 2015;; Wilkinson et al., 2018). Acknowledging the limitations of the system of delivery, the module design sought to incorporate lessons learned from the review of active learning and means to engage a higher-level cognitive activity in students (Marton & Saljo, 1976b). The modules intended learning outcomes extend to:

(1) Understand the role of financial modelling in determining the market value of investment and development properties.
(2) Analyse comparable sales to find appropriate valuation metrics.
(3) Develop a model to assess the market value of an income producing property.
(4) Assess expected values and returns given a change in key values.

As an outcome-based learning and teaching, and the related approach of constructive alignment, the second stage of the design process required the systematic alignment of teaching or learning activities, and the assessment tasks to the prescribed learning outcomes (Biggs & Tang, 2009, 2011).

### Module learning and teaching activities

Brief readings present an introduction to valuation approaches and make connections to the International Valuation Standards. The demonstration videos provide a step-by-step guide to the development of an Excel-based model to assess the market value of an

income producing property investment. Students are encouraged to watch the videos and simultaneously develop their own financial model, allowing them to work at their own pace, asynchronously.

The body of the module is separated into four parts that address a short narrative that connects the property investment theory to the studied property and the valuation approaches prescribed by the International Valuation Standards (IVS). An extract of the short narrative that introduces the investment and development property and IVS is presented in Appendix A. The module's investment property is a real multi-tenanted two-story office building. In discussing the market approach, the IVS Comparable Transaction Method is presented along with sales evidence of similar commercial investments, as in Appendix B.

With only a brief connection to valuation theory, the module presents students with their first activity, a guided, set-by-step video to commence the development of their own valuation model, Figure 1, Module Activity 1.

Further valuation theory is introduced at around the same time that theory is applied as the module addresses income approaches to valuation and has the students' progress with the valuation model development. The frame of the module is depicted in Table 1, Module structure.

Activity 1: Build your valuation model


https://youtu.be/kusbJX2Ij5k **33 minutes**

Follow the video as you build your valuation model. Equations, formulas, and functions used include:

**EDATE(start_date,months)** *Returns the serial number that represents the date that is the indicated number of months before or after a specified date (the start_date). Use EDATE to calculate maturity dates or due dates that fall on the same day of the month as the date of issue.* (Microsoft 2020)

**Absolute references** - *... to maintain the original cell reference in this example when you copy it, you make the cell reference absolute by preceding the columns ... and row ... with a dollar sign ($).*

Figure 1. Module activity 1.

Table 1. Module structure.

| Part | Theory | IVS 105 | IVS 410 | Case study | Activity | Video |
|---|---|---|---|---|---|---|
| 1. Investment and Development Property | Financial dimension of property | 90.1 | | Introduces case study | - | - |
| 2. Valuation Approaches | Market Approach | 10.1–3 30.4 | | Sales evidence | - | - |
| | Valuation Models | 90.1 | | Tenancy schedule outgoings | 1: Build your valuation model. | https://youtu.be/kusbJX2lj5k |
| 3. Income Approach | Capitalisation of net income | 40.2 40.4 | | Capitalisation | 2: Build your valuation model | https://youtu.be/hkdClxPkKFs |
| | Discounted Cash Flow Analysis | 50.4 | | Assumptions Income schedule DCF | 3: Build your valuation model. | https://youtu.be/aPrdzDEZQ-Y |
| 4. Development Property | Market approach | 30.4 | 50 | - | - | - |
| | Residual approach | | 90 | Residual approach | - | https://youtu.be/Wl1yvuRHuhs |

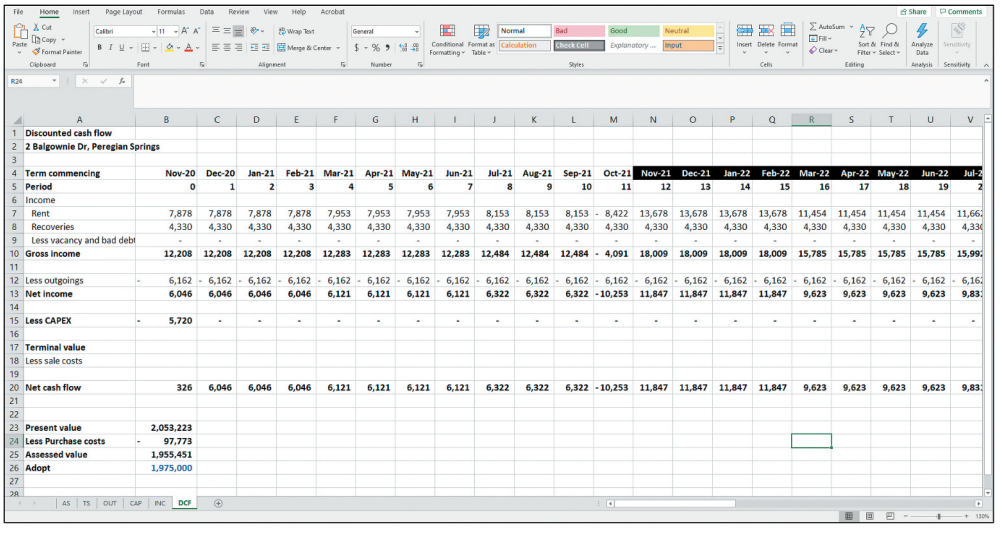
At the conclusion of the module readings and activities, it is expected that the students have an enhanced understanding and application of financial modelling in the valuation of investment and development property. Successful completion of the activities is demonstrated by the students having their own working investment valuation model. The model is a spreadsheet incorporating six sheets with:

(1) Assumptions [AS] that address salient market-based assumptions including growth rates.
(2) Tenancy schedule [TS] including analysis of passing and market incomes.
(3) Outgoing schedule [OUT] presenting ongoing annualised expenses.
(4) Capitalisation approach [CAP] including adjustments for income that is above or below market levels.
(5) Income and expense projection [INC] that reflects the month-by-month net income and projected capital expenditure.
(6) Discounted cash flow [DCF] that extends to a sixth, terminal year with monthly rests.

An extract of the final sheet, DCF, is illustrated in Figure 2, Discounted cash flow.

## *Module assessment*

The assessment comprises 10 questions. Questions eight to ten relate to the use of the valuation model they have developed. The questions are randomised, meaning the questions and answers differ between students and attempts. Question 10 requires the student to consider that the property has just sold, adopting a sale price as market, and working back to find the appropriate valuation metrics, with "The property has just sold



| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Discounted cash flow** | | | | | | | | | | | | | | | | | | | | | |
| 2 | **2 Balgownie Dr, Peregian Springs** | | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | |
| 4 | **Term commencing** | **Nov-20** | **Dec-20** | **Jan-21** | **Feb-21** | **Mar-21** | **Apr-21** | **May-21** | **Jun-21** | **Jul-21** | **Aug-21** | **Sep-21** | **Oct-21** | **Nov-21** | **Dec-21** | **Jan-22** | **Feb-22** | **Mar-22** | **Apr-22** | **May-22** | **Jun-22** | **Jul-2** |
| 5 | **Period** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **2** |
| 6 | Income | | | | | | | | | | | | | | | | | | | | | |
| 7 | Rent | 7,878 | 7,878 | 7,878 | 7,878 | 7,953 | 7,953 | 7,953 | 7,953 | 8,153 | 8,153 | 8,153 | - 8,422 | 13,678 | 13,678 | 13,678 | 13,678 | 11,454 | 11,454 | 11,454 | 11,454 | 11,66 |
| 8 | Recoveries | 4,330 | 4,330 | 4,330 | 4,330 | 4,330 | 4,330 | 4,330 | 4,330 | 4,330 | 4,330 | 4,330 | 4,330 | 4,330 | 4,330 | 4,330 | 4,330 | 4,330 | 4,330 | 4,330 | 4,330 | 4,33 |
| 9 | Less vacancy and bad debt | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 10 | **Gross income** | **12,208** | **12,208** | **12,208** | **12,208** | **12,283** | **12,283** | **12,283** | **12,283** | **12,484** | **12,484** | **12,484** | **- 4,091** | **18,009** | **18,009** | **18,009** | **18,009** | **15,785** | **15,785** | **15,785** | **15,785** | **15,99** |
| 11 | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Less outgoings | - 6,162 | - 6,162 | - 6,162 | - 6,162 | - 6,162 | - 6,162 | - 6,162 | - 6,162 | - 6,162 | - 6,162 | - 6,162 | - 6,162 | - 6,162 | - 6,162 | - 6,162 | - 6,162 | - 6,162 | - 6,162 | - 6,162 | - 6,162 | - 6,16 |
| 13 | **Net income** | **6,046** | **6,046** | **6,046** | **6,046** | **6,121** | **6,121** | **6,121** | **6,121** | **6,322** | **6,322** | **6,322** | **-10,253** | **11,847** | **11,847** | **11,847** | **11,847** | **9,623** | **9,623** | **9,623** | **9,623** | **9,83** |
| 14 | | | | | | | | | | | | | | | | | | | | | | |
| 15 | **Less CAPEX** | - **5,720** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 16 | | | | | | | | | | | | | | | | | | | | | | |
| 17 | **Terminal value** | | | | | | | | | | | | | | | | | | | | | |
| 18 | Less sale costs | | | | | | | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | | | | | | | | |
| 20 | **Net cash flow** | **326** | **6,046** | **6,046** | **6,046** | **6,121** | **6,121** | **6,121** | **6,121** | **6,322** | **6,322** | **6,322** | **-10,253** | **11,847** | **11,847** | **11,847** | **11,847** | **9,623** | **9,623** | **9,623** | **9,623** | **9,83** |
| 21 | | | | | | | | | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | | | | | | | | |
| 23 | **Present value** | **2,053,223** | | | | | | | | | | | | | | | | | | | | |
| 24 | **Less Purchase costs** | - **97,773** | | | | | | | | | | | | | | | | | | | | |
| 25 | **Assessed value** | **1,955,451** | | | | | | | | | | | | | | | | | | | | |
| 26 | **Adopt** | **1,975,000** | | | | | | | | | | | | | | | | | | | | |
| 27 | | | | | | | | | | | | | | | | | | | | | | |
| 28 | | | | | | | | | | | | | | | | | | | | | | |

**Figure 2.** Discounted cash flow.

for $x. The transaction is between and willing buyer and seller and meets the API definition of market value. Assuming no other changes what is the [analysed] capitalisation rate reflected from the sale?".

In this manner, successful completion of the module should only be achieved if the student has an accurate and working valuation model, correctly changes variables, and appropriately interprets the results.

## *Module alignment*

The outcome-based alignment between the learning outcomes, learning materials and assessment are presented in Table 2, Module alignment.

**Table 2.** Module alignment.

| Intended learning outcomes | Activity | Assessment |
|---|---|---|
| 1. Understand the role of financial modelling in determining the market value of investment and development properties. | P1-4 | Q1<br>Q2 |
| 2. Analyse comparable sales to find appropriate valuation metrics | P2 and the modelling required to answer Q10 | Q3<br>Q4<br>Q5<br>Q6<br>Q7<br>Q10 (A-D) |
| 3. Develop a model to assess the market value of an income producing property | P2-3 and activities 1–3 | Q8 (A-D)<br>Q9 (A-D)<br>Q10 (A-D) |
| 4. Assess expected values and returns given a change in key values. | P2-4 and modelling required to answer Q8-10 | Q8 (A-D)<br>Q9 (A-D)<br>Q10 (A-D) |

Constructive alignment is shown in the systemic alignment of teaching or learning activities, and the assessment tasks to the learning outcomes, according to the learning activities (Biggs & Tang, 2009, 2011). That said, the alignment in Table 2, does not demonstrate achievement of the learning outcomes. With a quiz being the method of assessment, only shallow responses are required, and students have no requirement to submit their valuation models for assessment or demonstrate reflection on their learnings. For the intended learning outcome, "Understand the role of financial modelling in determining the market value of investment and development properties", a reflective journal may best form of assessment, for learning and providing evidence of students' reflections (Boyd, 2015).

Satisfaction surveys from students who have completed the module may assist with assessing achievement of learning outcomes; however, as Warren (2013) notes, there is an overreliance on student satisfaction surveys in higher education performance measurement, quoting Professor Beard's transcript recorded with the British Broadcasting Corporation (2012). Beard asserts that, at times, there is a disconnection between the satisfaction recorded by a student and the quality of education provided, and development of the student, in saying:

> dissatisfaction and discomfort have their own, important, role to play in a good university education. We're aiming to push our students to think differently, to move out of their intellectual comfort zone, to read and discuss texts that are almost too hard for them to manage. It is, and it's meant to be, destabilising. (BBC 2012)

There are other approaches to curriculum design that enhance the likelihood of students achieving the intended learning outcomes. The Conceiving, Designing, Implementing, Operating (CDIO) education framework, as demonstrated in the property course redevelopment exercise by Azasu and Gibler (2016) may provide a means to engage stakeholders in the measurement of learning outcome achievement. According to Azasu and Gibler (2016) the CDIO framework gives rise to:

> . . . an integrated curriculum that explicitly accounts for stakeholder requirements. The resultant curriculum is continuously refined by the results of future student achievement, changes in stakeholder requirements over time, institutional changes, and changes in faculty as well as funding availability' (Azasu & Gibler, 2016, p. 293).

The CDIO framework is suited to the development of a university degree program as it may be used to map the learning journey and development of knowledge skills and attributes. The framework may be used to engage with stakeholders for curriculum reviewal and redesign. That said, it is not designed to accommodate unit-level activity structuring and it does not specifically address COVID-19 impacts on learning and teaching. To address the further development of the Valuation Modelling module and associated activities and assessment, another pandemic specific structure is considered.

## *Valuation modelling during COVID-19*

Our collective approach to the COVID-19 challenge has, in most cases, necessitated physical distancing, requiring an immediate change to traditional higher education delivery models, such as face-to-face and blended learning. The change has affected

institutions and courses in different ways. Providers of online materials including massively open online courses (MOOCs) are beneficiaries as face-to-face institutions look to integrate established online resources into their curriculum. Alternatively, students may transition to MOOCs and join the "educational revolution that has the potential to override borders, race, gender, class and income" (Emanuel, 2013, p. 342).

That said, the deeper learning approaches identified in the literature review are resource intensive and not suited to current MOOCs and online delivery (Boyd, 2015). Conversely, blended learning, previously viewed as a mechanism to enhance face-to-face delivery (Poon, 2014), has been considered in the development of pedagogical models presented as a response to COVID-19 (Petronzi & Petronzi, 2020). The Petronzi and Petronzi (2020) Online and Campus (OaC) Model is intended for higher education institutions utilising blended learning as a standardised approach. The model was presented as a response to COVID-19; however, the authors suggest it may be utilised as a progressive approach to learning and teaching (Petronzi & Petronzi, 2020).

The OaC model suggests an applied route from asynchronous, to synchronous and then campus learning. The model, incorporating suggested examples, summary of student experience and tutor roles and responsibilities, is presented in Figure 3, Online and Campus (OaC) Model.

The Petronzi and Petronzi (2020) approach commences with self-paced learning of knowledge and theory. The next stage is synchronous with all the students embedding and conceptualising the knowledge. Finally, the students attend campus and apply or challenge the gained knowledge through problem-based learning.

As a framework for a unit designed to enhance understanding and application of valuation modelling, the OaC model may be adapted to include the Valuation Modelling module as the first asynchronous individual learning activity, as depicted in Table 3, valuation modelling unit structure. The next stage builds on the introduced knowledge and model development to synchronously analyse and evaluate valuation methods. The final stage may comprise an active learning workshop that embeds aspects of problem-based learning, held on campus or in a virtual meeting setting.

The valuation modelling unit structure valuation has a novel "apply, evaluate, and solve", or AES, framework. The model has the benefit of providing self-paced learning where students may choose to exit when they have an introductory knowledge and a working valuation model. The completion of the module may contribute to a lower qualification, certificate, or even professional non-traditional credit (McGrath et al., 2020). Having completed the module, students who wish to continue will join a learning community with prior experience in model development. As a learning community, they will undertake a deeper analysis of valuation approaches, analysing, evaluating, and ultimately reflecting on their model, other methods of valuation and the inputs that inform the valuation modelling. The final stage will engage a higher or deeper level of cognition, as they join fellow students in an intensive workshop where they cooperatively seek an answer to a complex problem or simulated critical event.

By bringing forward the practical or applied component of the valuation modelling, the staging of the subject, or unit, plan more accurately resembles the progression inherent in academic progression such as the Australian Qualifications Framework

*A depiction of the Online and Campus (OaC) model with a suggested route and summary of tutor roles and student experience for each stage of the learning process.*

| | Suggested Example | Opportunities and Roles |
|---|---|---|
| [1] Introduce Knowledge ⬇ | Asynchronous: | **Student Opportunities/Role:**<br>[1] Flexible and accessible engagement with knowledge and theory.<br>[2] Ability to work at own pace and access different representations of the same content.<br>[3] Develop academic and graduate employability skills. |
| | | **Tutor Opportunities/Role**<br>[1] Representation of content to make accessible.<br>[2] Embedding of teaching tasks.<br>[3] Formative opportunities through tasks.<br>[4] Opportunity to provide individualised feedback. |
| [2] Embed/ Conceptualise ⬇ | Synchronous: | **Student Experience:**<br>[1] Synchronise knowledge transmission<br>[2] Direct tutor contact<br>[3] Less social pressure than campus/more anonymity if supported correctly can equal higher engagement and more confidence to responds. |
| | | **Tutor Opportunities/Role**<br>[1] Delivery of essential content materials, theory and key messages.<br>[2] Active question and answer opportunity.<br>[3] Some limited formative assessment through engagement.<br>[4] Cohort/group digital collaboration tasks. |
| [3] Apply/ Challenge ⬇ | Campus: | **Student Experience:**<br>[1] Problem-based learning<br>[2] Embedding of knowledge with peer and tutor support<br>[3] Self-reflection/self-assessment opportunity.<br>[4] Dialogic learning and deepening of understanding.<br>[5] Social opportunities and team building. |
| | | **Tutor Opportunities/Role**<br>[1] Formative assessment of taught knowledge, adapting task to group needs appropriately.<br>[2] Practical opportunities and teaching (where required).<br>[3] Guided group work and active learning opportunities. |

**Figure 3.** Online and Campus (OaC) model (Petronzi & Petronzi, 2020, p. 502).

(AQF) (Australian Government, 2021). For example, the first "apply" stage of the valuation modelling unit aligns well with the AQF level 6 (Advanced Diploma, Associate Degree) criteria which addresses skills with:

> Graduates at this level will have a broad range of cognitive, technical and communication skills to select and apply methods and technologies to:
>
> •analyse information to complete a range of activities
>
> •interpret and transmit solutions to unpredictable and sometimes complex problems
>
> •transmit information and skills to others (AQF Australian Government, 2021)

The subsequent stages in the AES model more closely resemble the criteria prescribed in the higher undergraduate and post-graduate university levels, AQF 7 and 8.

**Table 3.** Valuation modelling unit structure (apply, evaluate, and solve model).

| Stage | Learning activities and material | Student role | Instructor role | Assessable deliverables |
|---|---|---|---|---|
| 1. Introduce knowledge and apply develop a working valuation model. [Apply] | Valuation Modelling module. As online asynchronous individual learning. | Engages with knowledge theory and works at own pace to develop an understanding of valuation approaches while developing a prescribed valuation model. | Facilitation through providing formative individualised feedback. Provides pathways for the student to access learning resources customised to their journey. | Valuation model Answered quiz |
| 2. Analyse and evaluate valuation methods and the inputs that inform their functioning. [Evaluate] | Experiential learning embedded in a learning management system. Synchronous including scheduled virtual meetings and discussion tasks. Still focused on individual learning. | Sources and interprets specific market information, analyses sales, and confirms assumptions. Justifies benchmarks and assumptions and debates theoretical underpinnings of the valuation methodologies adopted and considered. | Facilitates formation of study groups and demonstrates pathways to obtain specific market information, sales details, and confirm assumptions. Provides pathways for the student to access learning resources customised to their journey. | Refined and specialised valuation model incorporating justification for inputs. Personal reflections. |
| 3. Design, develop and share a real solution for a set problem or simulated critical event. [Solve] | Active and intensive learning workshop embedding aspects of problem-based learning. Set on campus or in a virtual meeting. Synchronous group learning. | Cooperatively analyses and interprets the problem or simulated critical event. Plans a pathway and coordinates activities to formulate a solution. Models the financial impact of the solution. Develops the narrative and presents the solution. | Provides problem instruction as a simulated client. Observes operation of team and coordinates the assessment panel. | Refined and/or redesigned valuation model. Face-to-face or multimedia sharing of the proposed solution. |

There are risks and potential problems when applying the new model. As Azasu and Gibler (2016) discuss, if we were shaped the unit or module to cover broad valuation modelling theory, there could be pedagogical risk in that the unit could cover too much, undermining students' understanding. Additionally, without sufficient instruction, the AES model may be incorrectly interpreted as a reverse of the challenge-drive model supported by McGrath et al. (2020), seeking to apply knowledge that has not yet been acquired.

## Further research and limitations

This study is primarily based on findings from published property education research and builds on that knowledge as it shares the design of learning materials and an approach to a structure university subjects, or units, to inform the practice of educating property students. A defining and controversial aspect of analysis and qualitative research of this nature relates to the active role of the researcher and their influence. With the main aim of qualitative research being to discover the perceptions and experiences of the participants so that the researcher can then extract themes (Levy, 2006), the researcher becomes embedded in their study. As such, the interpretive nature of the qualitative research approach is affected by the researcher's interpretations, leading to potential misrepresentations of information, however unintentional (Brown, 1992).

In this research, it is important to identify perceived or actual researcher bias. The author is a property academic who serves on the Australian Property Institute's National Education Committee. He has advocated for fresh approaches to enhance the learning for property students.

Another limitation of this study may be considered in the interpretation of the background, specifically the learning theory of constructivism and the approach of constructive alignment. This research assumes knowledge is not transmitted to the student but rather is constructed through activity or social interaction. For proponents of more pragmatic, or objectivist, teaching practices, such a theory and approach may be considered antecedent to academic chaos (Jonassen, 1991).

The Valuation Modelling module and proposed AES model are novel additions of the author. While the module and model are structured with consideration given to published research findings and the investigation into property education, there has been no empirical testing. Further research is necessary to provide more conclusive justification for their relevance in property education and research. More advanced analysis would consider how the knowledge, skills, and attributes associated with valuation modelling are developed over the duration of the university course or program (Azasu & Gibler, 2016).

## Conclusion

As asserted by Biggs and Tang (2009) active learning, through problem-based learning activities, compels non-academic students to employ higher-level cognitive activity, making them learn more like their academic counterparts. In turn, this less passive approach is said to lead to enhanced learning and good teaching.

The problem with these learning and teaching approaches is that they are resource intensive and rely heavily on the selection and performance of the industry participant. With the pandemic necessitating physical distancing, engaging with industry is made more difficult. If more active approaches to learning are adopted, then new strategies will be required to utilise resources more efficiently or even simulate the role of the industry participant.

This study shared the design of Valuation Modelling online learning module commissioned by the API. Subsequently, the research considered how the module may best be incorporated into higher education. Through adaptation of the Petronzi and Petronzi

(2020) Online and Campus (OaC) model, a Valuation Modelling subject, or unit, was presented as an example of how synchronous and asynchronous learning activities may be coordinated to provide the benefit of case-based and problem-based learning during the COVID-19 pandemic.

The resultant AES structure, or model, more closely aligns with educational progression and has the potential to accommodate case-based and problem-based learning activities with less reliance on human resources. The AES model may assist universities and professional associations bringing together their resources and materials to structure other collaborative learning programs to advance property education.

## Disclosure statement

This research, specifically the development of the Valuation Modelling module, was financially supported by the Australian Property Institute.

## Funding

This work was supported by the Australian Property Institute [NA].

## References

Australian Government, Department of education, skills and employment, Australian Qualifications Framework (AQF) (2021). *AQF Levels*. Website. viewed 12 March 2021. https://www.aqf.edu.au/aqf-levels

Australian Property Institute (API) (2021). *API education*, website. viewed 4 March 2021. https://www.api.org.au/professional-development/

Azasu, S., & Gibler, K. M. (2016). The CDIO model for real estate curriculum development. *Journal of Real Estate Literature*, *24*(2), 287–308.

Biggs, J. (1993). From theory to practice: A cognitive systems approach. *Higher Education Research & Development*, *12*(2), 73–85.

Biggs, J. (1999). What the student does: Teaching for enhanced learning. *Higher Education Research & Development*, *18*(1), 57–75.

Biggs, J., Kember, D., & Leung, D. (2001). The revised two-factor study process questionnaire: R-SPQ-2F. *British Journal of Educational Psychology*, *71*(1), 133–149.

Biggs, J., & Tang, C. (2009). *Teaching for quality learning at university: What the student does* (3rd Ed ed.). Berkshire England: SRHE and Open University Press.

Biggs, J., & Tang, C. (2011). *Teaching for quality learning at university: What the student does* (4th Ed. ed.). Berkshire. England: SRHE and Open University Press.

Boyd, D., Amidu, A. R., & Smith, M. (2014). Developing a practice-based body of real estate knowledge: A delphi study. *Journal of Real Estate Practice and Education*, *17*(2), 139–167.

Boyd, S. (2015). *Playing property – Designing serious games to enhance the learning experience for undergraduate property students in Australia*. Doctoral thesis. University of the Sunshine Coast. Sippy Downs. QLD.

Boyd, T. (2005). Stakeholder impact on property education programs. *Proceedings from the 11th Annual Pacific Rim Real Estate Society Conference*. Melbourne. 23–27 January 2005.

Brown, A. (1992). Design experiments: Theoretical and methodological challenges in creating complex interventions in classroom settings. *Journal of Learning Sciences*, *2*(2), 141–178.

Charles, S. (2016). Graduate real estate education: The ULI Hines student competition as a pedagogical tool. *Journal of Real Estate Practice and Education*, *19*(2), 149–174.

Emanuel, E. (2013, November). Online education: MOOCs taken by educated few. *Nature*, *503* (21), 342.
International Valuation Standards Council (IVS) (2020a). International Valuation Standards, *IVS 105 Valuation Approaches and Methods*. effective 31 January 2020
International Valuation Standards Council (IVS). (2020b). International valuation standards. *IVS 410 Development Property. Effective*, *31*. January 2020.
Jonassen, D. (1991). Objectivism versus constructivism: Do we need a new philosophical paradigm? *Educational Technology Research & Development*, *39*(3), 5–14.
Levy, D. (2006). Qualitative methodology and grounded theory in property research. *Pacific Rim Property Research Journal*, *12*(4), 369–388.
Marton, F., & Saljo, R. (1976a). On qualitative differences in learning: I – Outcome and process. Scottish Academic Press. Edinburgh *British Journal of Educational Psychology*, *46*(1), 1.4–11.
Marton, F., & Saljo, R. (1976b). On qualitative differences in learning: II – Outcome as a function of the learner's conception of the task. Scottish Academic Press, Edinburgh *British Journal of Educational Psychology*, *46*(2), 2.4–11.
McGrath, K., Wang, B., Jackson, B., Kämpf-Dern, A., Malone, K., Funk, D., & Geurts, T. G. (2020). The future of real estate education: A multi-faceted perspective. *Journal of Real Estate Practice and Education*, *22*(1), 40–55.
Mooya, M. M. (2015). The education and professional practice of valuers in South Africa: A critical review. *Property Management*, *33*(3), 245–274.
Palm, P., & Pauli, K. S. (2018). Bridging the gap in real estate education: Higher-order learning and industry incorporation. *Journal of Real Estate Practice and Education*, *21*(1), 59–75.
Petronzi, R., & Petronzi, D. (2020). The Online and Campus (OaC) model as a sustainable blended approach to teaching and learning in higher education: A response to COVID-19. *Journal of Pedagogical Research*, *4*(4), 498–507.
Poon, J. (2014). A cross-country comparison on the use of blended learning in property education. *Property Management*, *32*(2), 154–175.
Poon, J. (2016). An investigation of characteristics affecting employment outcomes and patterns of real estate graduates. *Property Management*, *34*(3), 180–198.
Poon, J., & Brownlow, M. (2015). Real estate student satisfaction in Australia: What matters most? *Property Management*, *33*(2), 100–132.
Susilawati, C., & Yam, S. (2013). Property case competition: Multi-stakeholder reflection. *Proceedings from the 19th Annual Pacific Rim Real Estate Society Conference*. Melbourne. 13–16 January 2013.
Vos, N., van der Meijden, H., & Denessen, E. (2011). Effects of constructing versus playing an educational game on student motivation and deep learning strategy use. *Computers & Education*, *56*(1), 127–137.
Warren, C. (2013). The future of university education. *Property Management*, *31*(2), 2.
Wilkinson, S., Halvitigala, D., & Antoniades, H. (2018). Educators, professional bodies and the future of the valuation profession. *Property Management*, *32*(2), 154–175.

## Appendix A

### *Investment and development property*

Market value is the present value of all future benefits. When the market considers those benefits in a financial sense rather than amenity, we incorporate income-related approaches to valuation.


For example, the most likely purchaser of a 2-story office building is an investor, maybe a private investor, a self-managed super fund, or another ownership entity such as a syndicate or small property trust. In each case, the investor would be interested in the anticipated return from their proposed investment. The returns from an office building comprise income from rentals and capital gain from owning the investment.

Properties purchased with the intention to develop are similarly considered and valued based on their projected return, or realisation, less the costs to develop.

To assist with the valuation of investment and development properties we use a form of financial modelling to forecast future cash flows and discount them to determine the asset's present value. The International Valuation Standards Council (IVSC) refers to these valuation models as "... quantitative methods, systems, techniques and qualitative judgements used to estimate and document value" (IVS 90.1).

## Appendix B

| | | | |
|---|---|---|---|
| 55 Mary Street, Noosaville<br>  | Oct-20<br>$1,440,000 | Area (NLA)<br>240 sqm | $ psm<br>6,000 |
| | Initial yield<br>6.61% | ACR<br>5.62% | IRR<br>7.10% |
| | Prominent 2 level office building with future development potential... | | |
| 224-226 David Low Way, Peregian<br>  | Jun-20<br>$720,000 | Area (NLA)<br>186 sqm | $ psm<br>3,871 |
| | Initial yield<br>- | ACR<br>6.67% | IRR<br>6.98% |
| | Level 1 office suite in a modern 2 level complex, at the fringe of the coastal village... | | |
| 5 Gibson Road, Noosaville<br>  | Nov-19<br>$3,200,000 | Area (NLA)<br>719 sqm | $ psm<br>$4,451 |
| | Initial yield<br>6.75% | ACR<br>6.23% | IRR<br>6.58% |
| | Ground floor retail and first floor office suites, within the traditional business centre... | | |