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Credit allocation and programmes design: insights from metaphor

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ABSTRACT

Volume is the dominant metaphor underlying the European Credit Transfer and Accumulation System (ECTS). Credits are used to 'express the volume of learning based on the defined learning outcomes and their associated workload', with the latter based on volume of student effort. But the convenience of volume can leave the first part overlooked, i.e. 'the defined learning outcomes' and in particular their relative importance or relative weight for achieving the overall programme outcomes. Paying attention to issues of relative weight and volume at module design stage is necessary to ensure overall programme balance and coherence. The second part of the article uses metaphor analysis to draw attention to this. Density, based on volume and weight, provides a more satisfactory metaphor for credit allocation, drawing attention to programme substance, which is what ultimately matters.

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Introduction

It is now over 30 years since the European Credit Transfer System (ECTS) was introduced (1989) to facilitate student mobility in the Erasmus programme. It subsequently developed into a credit accumulation system at institutional, regional, national and European level, as part of the process of developing a system of credit for the European Higher Education Area (EHEA). The system is based on the notion of learning as credit that is cumulative and transferable and relies on other metaphors such as volume, workload and time.

While such metaphors promote and enable the flexible management of learning within the context of the lifelong learning agenda, they have been the focus of some critique. For example, Winter singled out the metaphors of notional learning time and general educational level as problematic, writing that, 'each of these metaphors is at best highly questionable, and the assumption that they can be combined to form a credit accumulation and transfer (CAT) framework has more to do with managerial ideology than with educational theory' (Winter 1993, 90). Learning as credit is seen as the 'commodification' of learning (Cooper 2007) and part of a managerialist agenda (Gleeson 2011), which encourages students to settle for minimally satisfactory learning, rather than striving for excellence in their learning (Karran 2004). The credit is what matters, rather than the learning.

The volume metaphor is particularly dominant in the discourse on credit allocation. The ECTS User's guide states that, 'ECTS credits express the volume of learning based on the defined learning outcomes and their associated workload' (European Commission 2015, 10). Learning is about volume, and based on two factors, i.e. the learning outcomes and associated workload. The second of these, workload is in turn defined in terms of time, i.e. 'an estimation of the time

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the individual typically needs to complete all learning activities' (European Commission 2015) and in the accompanying formula, one credit equates to 25 to 30 h. In this combination of metaphors, or rather mixed metaphors, learning as volume is based on workload, which in turn is expressed in terms of time. But it is volume that is to the fore; the volume of learning becomes the volume of student efforts hours. This is also noticeable in the literature where studies focusing on volume of student effort are in plentiful supply, for example, comparing the estimation of students and academics as to the time needed to complete course work (Alshamy 2017).

This focus on volume can have the effect of drawing attention away from the first and more important of the two variables in the ECTS definition, i.e. 'defined learning outcomes'. A key aspect of module learning outcomes is their relative importance for achieving the overall programme outcomes. But there are also other issues that come to the fore and the usefulness of learning outcomes for guiding teaching, learning and assessment has been the focus of some criticism.

In addressing these issues, the second part of the article takes the volume metaphor, develops it further, and proposes density, based on both volume and weight, as a more complete metaphor for understanding credit allocation and programme substance.

Learning outcomes

In higher education programme design, learning outcomes are 'attributed to individual educational components and to programmes at a whole' (European Commission 2015, 72). They are defined as 'statements of what the individual knows, understands and is able to do on completion of a learning process' (European Commission 2015, 10). However, the use of learning outcomes is contested, with the main debate focused on whether 'learning and the outcomes of learning can and should be stated in full-ended, stable, pre-specified and measurable terms or in open-ended, flexible terms with limited opportunities for measurement' (Prøitz 2010, 133). While the former corresponds to the usage in the ECTS User's guide, as Prøitz shows, there is a wide range of perspectives allied to the latter position.

Hussey and Smith (2008) identify three kinds of learning outcome: (1) those used in individual teaching events; (2) those specified for modules or short courses; and (3) those specified for whole degree programmes. They argue that the first is the most useful kind if employed flexibly, reflecting the fact that not all learning outcomes are intended. The second kind (intended module learning outcomes) are 'little more than a list of contents; they cannot be stated precisely and have limitations in guiding assessment' (p. 107). As for the third kind, they consider it 'otiose' to attempt identifying programme learning outcomes, which would have to be very broad and would 'amount to a list of topic areas and skills that have to be covered by the programme' (p. 113).

Elsewhere, they call for a broader, flexible and more realistic understanding of learning outcomes, 'better suited to the realities of the classroom and of practical use to those teachers' (Hussey and Smith 2003, 357). Knight (2001) is also dismissive of outcomes-led planning in his process approach to curriculum in higher education, deeming it 'better to concentrate on the processes that might lead to the sorts of outcomes that are wanted' (2001, 375). In order to support complex, rather than simple learning, planning should start by, 'imagining how to draw together the processes, encounters or engagements that make for good learning' (2001, 375). Brown (2007) also dismisses global learning outcomes as subjective, post hoc measures of factors only indirectly related to learning. He proposes five activity types from Laurillard (2002) (attending or apprehending; investigating or exploring; discussing and debating; experimenting; articulating) as a way of making 'predictive' learning outcomes more useful for teaching, learning and assessment purposes.

The criticism then is that learning outcomes are not sufficiently useful for creating the kind of programmes conducive to good teaching, optimum student engagement and deep learning. One way this could be addressed is a greater focus on how the module learning outcomes contribute to the overall programme knowledge, skills and competences that graduates will need post-qualification. Greater attention on the relevance and relative importance of learning outcomes is

likely to make for more engaging teaching and learning. But such issues of relative weight can be easily overlooked in credit allocation, especially where questions of volume seem to dominate.

Relative weight and credit

When originally introduced as a credit transfer system, ECTS enabled HEIs in the European Higher Education Area (EHEA) to describe the amount of academic work necessary to complete course units, thereby facilitating the transfer and recognition of students' learning from time spent abroad (European Commission 2015). Credits were allocated to sets of learning outcomes on a relative basis, i.e. relative to the overall programme workload. Study periods completed abroad could be recognised on the basis of prior agreements between sending and receiving institutions, allowing for the credit allocation to be modified in transit. In other words, a set of learning outcomes allocated x credits in a receiving institution could take on a different significance and value when put in the context of the student's programme in the sending institution.

The Tuning project (Wagenaar 2006) provides an example derived from the Common European Framework of References for Languages (CEFR) to illustrate this relationship between credits and learning outcomes. The CEFR distinguishes different language competence levels from A1 (very basic) to C2 (near native). For different groups of learners the workload, and therefore the credits, required to obtain the same level of competence will differ. A typical French higher education student might need 30 ECTS-credits to achieve a competence of Spanish at level C1, while a Dutch student might require 60 ECTS-credits to achieve the same level. In general, it should be easier for a Dutch student to learn another Germanic language while for a French student learning another Romance language should be easier. The example shows that we cannot say in absolute terms that a given set of learning outcomes equals x amount of credits in all contexts.

While initially designed for this kind of credit transfer between countries in the EHEA, ECTS later developed into a credit accumulation system use by individual countries, where 'credits receive absolute and no longer relative value' (Wagenaar 2006, 225). Module credit was accumulated within a particular programme and the relative weight of individual modules within the overall programme remained constant.

But in a context of lifelong learning and greater mobility, students are increasingly seeking to transfer completed modules from one programme to another. For example, Di Paolo and Pegg (2013) report that in 2009/10 the Open University received around 14,000 credit transfer applications, 'many from students wanting to transfer credit from previous full-time studies at conventional universities and colleges of further education (2013, 611)'. There is also an increase in vocational undergraduate qualifications, which offer pathways and direct entry to the final year of undergraduate degrees (Dismore, Hicks, and Lintern 2010). This taking forward of past achievement is not problematic where the learning being transferred is relevant for the new programme, as for example, where the learning outcomes relate to generic skills. However, this may not always receive due attention. For example, one UK study on transfer of credit to the Open University found that, 'some students claimed transfer over 10 years after their initial study, sometimes in new subject areas' (Di Paolo and Pegg 2013). Doubts about the relevance and relative value of the transferred learning outcomes have consequences for programme balance and coherence. What can help here is a stronger message in programme design that allocating credit to module learning outcomes is not a simple matter of determining the volume of effort needed to achieve them, but should also reflect their relative value and relevance for contributing to the overall programme goals in question, i.e. relative weight.

Relative weight is likely to feature more prominently in the design of professionally-oriented programmes where given the necessity of meeting overall professional standards, the relative importance of individual learning outcomes may occasion greater scrutiny. Programme designers may also have to comply with certain minimum credit allocations for different components in a programme. For example, in an Irish context, in their guidelines to providers of teacher education programmes, the professional body for teachers (primary, secondary, and further education)

stipulates certain minimum credit weightings for different programme components (Teaching Council 2017).

This focus on relative weight can also be observed in the credit system developed for the vocational education and training programmes offered in Further Education. Similar to ECTS, the European credit system for vocational education and training (ECVET) is also based on volume of workload, where 60 credit points is equivalent to a year of full-time study (Council of the EU 2009). However in contrast to ECTS, where credit is to be allocated on the basis of learning outcomes and the associated workload, the criteria for credit allocation in ECVET is more explicit on including, not just the volume of student effort, but also the relative importance of the learning outcomes within a qualification, as expressed as follows:

(1) the relative importance of the learning outcomes;
(2) the complexity, scope and volume of learning outcomes in the unit;
(3) the effort necessary for a student to acquire the knowledge, skills and competence required for the unit. (ECVET Users' Group 2011)

Returning to ECTS, the importance of relative weight can be easily overlooked in programme design, as the following section on the User's Guide illustrates, where it is the volume of associated work generated by the learning outcomes that commands most attention.

Credit allocation and programme design

Credit allocation is a major part of programme design. The ECTS User's Guide states that 'the use of ECTS credits aids programme design by providing a tool which improves transparency and helps to engender a more flexible approach to curriculum design and development' (European Commission 2015, 18). It then identifies a series of steps programme designers should follow: (1) programme context; (2) programme profile; (3) programme learning outcomes; (4) programme structure and allocation of credits; (5) learning, teaching and assessment; (6) monitoring of credit allocation.

In summary, Step 1 requires designers to consider the overall programme context, which the guide indicates should be set in the context of mission statements, professional requirements, etc. In Step 2, in consultation with relevant stakeholders, the designers identify the programme level, key learning outcomes, required competences, and main learning, teaching and assessment activities. Step 3 determines the programme learning outcomes. This is followed by programme structure and allocation of credit in Step 4, where 'learning outcomes, with related assessment strategies and assessment criteria, should be defined for each educational component' (p. 24). In other words, the module learning outcomes are determined in Step 4, while those at programme-level are decided in Step 3. Step 5 deals with principles in learning, teaching and assessment. In Step 6 the focus is on programme monitoring, 'to establish whether the credit allocation, the defined learning outcomes and the estimated workload are achievable, realistic and adequate (European Commission 2015, 28)'.

While this step approach is very useful, programme design and credit allocation decisions usually involves a more iterative back-and-forth approach, reflecting the complexity of the task. This is particularly the case in Step 4 where learning outcomes are being defined and where credit is being allocated:

> After the constituent parts of the programme have been identified, the overall structure should be outlined and credits allocated to each component, on the basis of its learning outcomes and associated workload, taking into account that 60 credits correspond to a full-time equivalent academic year. (European Commission 2015, 25)

While the consequences of 'associated workload' for credit allocation are relatively easy to work out, being more quantifiable, much more complex is how to factor in the 'learning outcomes' themselves. Taxonomies and frameworks may be used to help create an appropriate challenge in the intended

knowledge, skills and competences (Kennedy 2006). But the relative weight of the outcomes is also an important factor that may be overlooked.

To emphasise the importance of relative weight, it is worth recalling that in programme design a finite amount of credit is being shared among sets of learning outcomes (that can be considered infinite in their importance). Module learning outcomes compete with each other for the credit available within the overall programme (with 60 credits available for a full year's study). This means that Step 4 can be quite protracted, involving negotiation and modification until the most ideal fit of outcomes and credit is achieved. Certain module outcomes may need to be reformulated in more or less demanding terms, in order to better reflect the credit value being allocated, thereby arriving at a programme design that rewards the learning appropriately. Learning outcomes need to be worth their weight, as it were. Wagenaar (2006) refers to this in Tuning, in terms of a 'gap' between the notional time needed to achieve the outcomes, and the actual time available, suggesting a need to consider the outcomes carefully so that there is sufficient credit available to recognise the importance of the outcomes in the correct proportions:

> 'That is the moment to make compromises with regard to the level of knowledge and skills as formulated in the desired learning outcomes and the available amount of time. It will probably mean that the learning outcomes have to be adjusted.' (Wagenaar 2006, 236)

When the credit allocation step starts in Step 4 therefore, designers will need to be ready to revisit earlier decisions with regard to how outcomes are expressed (Step 3). This need for negotiation and compromise can be easily missed in the linear stepwise approach to programme design presented in the Guide.

By way of a qualification to this argument, it is indeed true that an opportunity remains to reflect the differential importance of learning outcomes during assessment, where module, assessment components linked to learning outcomes may be weighted differently. To illustrate this point, the example in Table 1 features three assessment components to assess the five outcomes. Three of the outcomes are assessed using the project (40%), while the other two are assessed using an examination (35%) and a presentation (25%). By simply modifying the percentages, the teacher can attribute greater importance to certain outcomes. However, the effect of this is rather limited given that the total module credit is already fixed.

To recap, while the ECTS User's guide indicates that credit should be allocated on the basis of 'the defined learning outcomes and their associated workload', the quantifiable nature of the latter can serve to shift attention away from the former, i.e. the module learning outcomes and in particular, their relative weight in contributing to the overall programme. The second part of this article seeks to address this imbalance by using metaphor to shift attention on to programme substance.

Table 1. Example of weighted assessment for learning outcomes within a module.

Module Learning Outcomes (LO)	Assessment component	Percentage of module marks
LO 1	Exam	35%
LO 2	Project	40%
LO 3	Class presentation	25%
LO 4	Project	40%
LO 5	Project	40%

Towards a new metaphor – programme density

Having illustrated the dominance of the volume metaphor in the first part of the article, as well as concerns with the usefulness of learning outcomes for teaching and learning, the article now considers if a shift in metaphor is possible.

A metaphor makes a comparison between two ideas that are not alike but that have something in common. It consists of three components: the topic is the subject of the metaphor, the vehicle is the

term used metaphorically, while the ground is the relationship between the topic and the vehicle (End 1986). Using metaphor offers what Schön (1983) classified as a 'generative' quality in that it may help clarify the concepts involved and develop new perspectives. Metaphors can dramatically impact people's perceptions in ways that have real-world consequences (Lakoff and Johnson 1980).

Metaphor analysis is also a valuable research tool for gaining new insights into education practice and theory (Jensen 2006). This is a method of discourse analysis, based on the work of Lakoff and Johnson (1980), and on the role that metaphor plays in human cognition. It examines the use of metaphor in order to increase understanding, and can lead to the creation of alternative metaphors. It represents an abductive or a more expanded inductive approach to reality as opposed to a deductive approach associated with positivism (Xu and Li 2011). In the current context, therefore, metaphor analysis enables the problematization of the dominance of the volume metaphor in ECTS credit allocation, and having done so, provides an alternative metaphor for thinking about credit allocation in a more complete way.

Novel metaphors are created when people put together ideas that are only loosely associated in their heads for generating new and alternative perspectives. The relationship or ground between both the topic and vehicle will be less obvious in such metaphors because they constitute a more unlikely pairing than more conventional metaphors. However, Riddell suggests that the insight generated may be greater, and draws on neuroscience to explain how 'these more novel pairings are more likely to happen when the focus of attention drifts beyond the problem at hand' (Riddell 2016, 371).

In physics, weight is calculated as mass times acceleration of gravity, gravity being a force by which all things with mass or energy are brought or gravitate towards each other. Therefore, in order to understand the weight of something, we need to consider the force that exists between it and something else. In our case, the something else is the overall academic programme, which provides the context to understand the significance or weight of particular (sets of) learning outcomes within it.

But we can take the metaphorical analysis further. Using mass, which is weight without gravity, brings us to a new measure, density. Density is a measure of what an object is made of, calculated by mass divided by volume. When Archimedes famously submerged the king's crown in water he was able to determine its volume. But only by considering this together with its weight could he test its density and prove that the crown was not gold but had cheaper metals in it.

Rather than discarding the volume metaphor, therefore, it can be combined with weight to generate a more satisfactory metaphor, density. In metaphorical terms, physics has provided a vehicle for the topic of programme design (End 1986). It would probably also qualify as a novel metaphor as Riddell (2016) understands it, given the range of ground between vehicle and topic. But the question of greater interest here is whether it can help with the concerns noted earlier in programme design, and shift attention in programme design on to programme substance.

Discussion

The article has brought volume into interaction with weight, generating a new more complete metaphor, density. Density avoids an overly simplistic understanding of credit allocation. Not only that. Density is synonymous with substance, something that needs to be at the forefront in any programme design. Stenhouse's metaphor for the curriculum as a recipe would not be out of place here, where the task of the designer (or cook) is to achieve the right consistency for learning (1975). In order to design programmes of substance, it is more helpful to think in terms of density.

But programme density or substance is also crucial for teaching, for creating the 'rich learning environments' to which Knight (2001) refers. As stated, module learning outcomes that reflect both volume and relative weight can more successfully capture programme essence, i.e. what matters for developing the intended graduate qualities and competences. They are therefore more likely to engage teachers and students in meaningful classroom interaction, more likely therefore to deliver the 'broader, flexible and more realistic understanding of learning outcomes' which Hussey and

Smith (2003) have called for. Such learning outcomes are also more conducive for the kind of 'teaching events' likely to bring about deep and enduring learning, which these authors identify as a key transition in higher education (Hussey and Smith 2010).

There is also a more practical consideration related to assessment, and specifically, the way in which a module's credit weighting determines the final grade point average. Because students may be strategic in how they invest themselves in their studies, modules that carry greater credit are likely to prompt greater relatively greater levels of engagement. Therefore, ensuring that modules are credit weighted in ways that accurately reflect, not just the volume of work they generate, but also the kind of work in terms of challenge and relative importance for overall programme success, can also have a big influence on student engagement.

Finally, a focus on programme substance is conducive to a greater level of professional dialogue between faculty members at design stage, which lends itself to higher-quality programmes. This includes discussion on how individual modules contribute to overall goals, how they fit together and whether there is scope for integration. This can also pave the way for other collaborative efforts during teaching, and assessment, for example, integrated assessment, i.e. using the one assessment activity to assess outcomes drawn from more than one module. This would also go some way towards guarding against the proliferation of assessment workload, as captured in the arms-race metaphor (Harland et al. 2015, 2020).

Conclusion

Prøitz (2010) notes that 'attentiveness to the dominant perspective and orientation is essential to open debate on what constitutes valuable learning (2010, 135)'. Metaphors are key in determining which perspectives dominate. With that in mind, the discussion in the article has proposed for consideration, a shift from one of volume, to weight to density.

Credit allocation in programme design is determined on the basis of two factors: the defined learning outcomes and associated volume of student effort. The article has argued that the convenience and dominance of volume can easily distract from the learning outcomes as the basis for credit allocation decisions. One aspect in particular that requires greater attention is their relative importance or relative weight for achieving the overall programme outcomes. This is captured in the distinction between absolute and relative value of credit and between accumulation and transfer. The article has argued that density, which is a function of the other two, is the overriding concept and metaphorically speaking, shifts the focus back on to programme substance – or programme consistency to continue with Stenhouse's 'curriculum as recipe' metaphor.

Broadening out the decisions on credit allocation in this way is also likely to result in learning outcomes that can be more useful as the basis for the kind of 'teaching events' described by Hussey and Smith (2008), i.e. likely to promote learning that is deep, and not just surface. Or indeed voluminous.

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No potential conflict of interest was reported by the author.

Notes on contributor

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References

Alshamy, A. 2017. "Credit Hour System and Student Workload at Alexandria University: A Possible Paradigm Shift." *Tuning Journal for Higher Education* 4 (2): 277–309. doi:10.18543/tjhe-4(2)-2017pp277-309.

Brown, S. 2007. "A Critique of Generic Learning Outcomes." *Journal of Learning Design* 2 (2): 22–30. doi:10.5204/jld.v2i2.37.

Cooper, P. 2007. "Knowing Your 'Lemons': Quality Uncertainty in UK Higher Education." *Quality in Higher Education* 13 (1): 19–29. doi:10.1080/13538320701272698.

Council of the EU. 2009. "Recommendation of the European Parliament and the Council of 18 June 2009 on the Establishment of a European Credit System for Vocational Education and Training (ECVET)." *Official Journal of the European Union C* 155: 11–18. http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32009H0708%2802%29 .

Di Paolo, T., and A. Pegg. 2013. "Credit Transfer Amongst Students in Contrasting Disciplines: Examining Assumptions about Wastage, Mobility and Lifelong Learning." *Journal of Further and Higher Education* 37 (5): 606–622. doi: 0309877X.2011.645471.

Dismore, H., H. Hicks, and M. Lintern. 2010. "The Destinations of Foundation Degree Graduates in the South West of England." *Journal of Education and Work* 23 (5): 451–470. doi:10.1080/13639080.2010.521738.

ECVET Users' Group. 2011. "The European Credit System for Vocational Education and Training ECVET Get to Know ECVET Better." Bruxelles: European Commission, http://www.ecvet-secretariat.eu/de/system/files/documents/14/questions-answers-about-ecvet-21/04/2010.pdf

End, L. 1986. "Grounds for Metaphor Comprehension." *Advances in Psychology* 39: 327–345.

European Commission. 2015. *ECTS Users' Guide*. Luxembourg: Publications Office of the European Union. https://ec.europa.eu/education/ects/users-guide/docs/ects-users-guide_en.pdf .

Gleeson, J. 2011. "The European Credit Transfer System and Curriculum Design: Product before Process?" *Studies in Higher Education* 38 (6): 921–938. doi:10.1080/03075079.2011.610101.

Harland, T., A. McLean, R. Wass, E. Miller, and K. N. Sim. 2015. "An Assessment Arms Race and Its Fallout: HighStakes Grading and the Case for Slow Scholarship." *Assessment & Evaluation in Higher Education* 40 (4): 528–541. doi:10.1080/02602938.2014.931927.

Harland, T., and N. Wald. 2020. "The Assessment Arms Race and the Evolution of a University's Assessment Practices." *Assessment & Evaluation in Higher Education* 1–13. doi:10.1080/02602938.2020.1745753.

Hussey, T., and P. Smith. 2003. "The Uses of Learning Outcomes." *Teaching in Higher Education* 8 (3): 357–368. doi:10.1080/13562510309399.

Hussey, T., and P. Smith. 2008. "Learning Outcomes: A Conceptual Analysis." *Teaching in Higher Education* 13 (1): 107–115. doi:10.1080/13562510701794159.

Hussey, T., and P. Smith. 2010. "Transitions in Higher Education." *Innovations in Education and Teaching International* 47 (2): 155–164. doi:10.1080/14703291003718893.

Jensen, D. 2006. "Metaphors as a Bridge to Understanding Educational and Social Contexts." *International Journal of Qualitative Methods* 5 (1): 36–54. doi:10.1177/160940690600500104.

Karran, T. 2004. "Achieving Bologna Convergence: Is ECTS Failing to Make the Grade?" *Higher Education in Europe* 29 (3): 411–421. doi: 10.1080/0379772042000331688.

Kennedy, D. 2006. *Writing and Using Learning Outcomes: A Practical Guide*. University College Cork: Cork.

Knight, P. T. 2001. "Complexity and Curriculum: A Process Approach to Curriculum-making." *Teaching in Higher Education* 6 (3): 369–381. doi:10.1080/13562510120061223.

Lakoff, G., and M. Johnson. 1980. *Metaphors We Live By*. Chicago: University of Chicago Press.

Laurillard, D. 2002. *2nd Edition) Rethinking University Teaching: A Conversational Framework for the Effective Use of Learning Technologies*. London and New York: Routledge Falmer.

O'Neill, G. 2010. "Initiating Curriculum Revision: Exploring the Practices of Educational Developers." *International Journal for Academic Development* 15 (1): 61–71. doi:10.1080/13601440903529927.

Prøitz, T. S. 2010. "Learning Outcomes—what are They? Who Defines Them? When and Where are They Defined?" *Educational Assessment, Evaluation and Accountability* 22 (2): 119–137. doi:10.1007/s11092-010-9097-8.

Riddell, P. 2016. "Metaphor, Simile, Analogy and the Brain." *Changing English, Studies in Culture and Education* 23 (4): 363–374. doi:10.1080/1358684X.2016.1228443.

Schön, D. 1983. *The Reflective Practioner: How Professionals Think in Action*. New York: Basic Books.

Stenhouse, L. 1975. *An Introduction to Curriculum Research and Development*. London: Heinemann.

Teaching Council 2017. "Teaching Council Registration Curricular Subject Requirements (Postprimary)." Maynooth: Teaching Council https://www.teachingcouncil.ie/en/Publications/Registration/Documents/Curricular-Subject-Requirments-after-January-2017a.pdf

Wagenaar, R. 2006. "Educational Structures, Learning Outcomes, Workload and the Calculation of ECTS Credits." In *Tuning Educational Structures in Europe. Universities' Contribution to the Bologna Process*, edited by R. Wagenaar and J. González, 223–246. Bilbao and Groningen: University of Deusto Press. http://www.unideusto.org/tuningeu/images/stories/workloads/LINE_3___EDUCATIONAL_STRUCTURE.pdf

Winter, R. 1993. "The Problem of Education Levels (Part 1): Conceptualising a Framework for Credit Accumulation and Transfer." *Journal of Further and Higher Education* 17 (3): 90–104. doi:10.1080/0309877930170309.

Xu, C., and H. Li. 2011. "Abduction and Metaphor: An Inquiry into Common Cognitive Mechanism." *Frontiers of Philosophy in China* 6 (3): 480–491. doi:10.1007/s11466-011-0151-5.