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Evidence in managing the learning experience.

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Summary - *Crynodeb*

Quality systems in general rely on the availability of appropriate evidence to permit the development of continuous improvement schemes. Practical service in managing the learning experience has highlighted the rich variety of sources of information available to the HE manager. Time basis has a critical importance in control, and the cycles of evidence collection occurs across the year are of variable value in terms of critique and analysis. The importance of formal mechanisms for quantitative and qualitative data collection are well established, but some of the use of such data is open to question, particularly where statistics are applied for small samples. The informal mechanisms are no less important, and can offer both short cycle opportunities for practical intervention and long-term quality improvements based on professionalism and systematic developments that are often not captured in the formal reporting cycles. The implications of typical problems and the value of the evidence sources within the context of likely use are assessed, with corrective actions indicated. The role of perception, and particularly of the setting and meeting of expectations, and the complexities arising from prior beliefs, is emphasised. Quality evidence is a matter of signposts for investigation; successful improvement of correct interpretation.

Yn gyffredinol mae systemau ansawdd yn dibynnu ar allu cael gafael ar dystiolaeth briodol er mwyn caniatáu datblygu cynlluniau gwella parhaus. Mae gwasanaeth ymarferol o ran rheoli'r profiad dysgu wedi tynnu sylw at yr amrywiaeth gyfoethog o ffynonellau gwybodaeth sydd ar gael i'r rheolwr AU. Mae pwysigrwydd tyngedfennol i'r sylfaen amser o ran rheolaeth, ac mae'r cylchoedd casglu tystiolaeth sy'n digwydd ar draws y flwyddyn o werth amrywiol o ran beirniadaeth a dadansoddi. Mae pwysigrwydd trefniadau ffurfiol ar gyfer casglu data meintiol ac ansoddol wedi hen ennill ei blwyf, ond mae modd cwestiynu rhywfaint o'r defnydd o ddata o'r fath, yn enwedig pryd y defnyddir ystadegau ar gyfer samplau bach. Nid yw'r trefniadau anffurfiol yn llai pwysig, a gallant gynnig cyfleoedd cylch byr ar gyfer ymyrraeth ymarferol a gwelliannau hirdymor o ran ansawdd wedi'u seilio ar broffesiynoldeb a datblygiadau systematig na fyddant yn aml yn cael eu cofnodi yn y cylchoedd adrodd ffurfiol. Asesir goblygiadau problemau nodweddiadol a gwerth y ffynonellau tystiolaeth o fewn cyd-destun y defnydd tebygol, gan nodi camau unioni. Pwysleisir rôl canfyddiad, ac yn benodol gosod a chyflawni disgwyliadau, a'r cymhlethdodau sy'n codi o gredoau blaenorol. Mae tystiolaeth o ansawdd yn fater o gyfeiriadau i'w harchwilio; gwella dehongliadau cywir yn llwyddiannus.

Keywords: Higher education, management, learning experience, evidence, continuous improvement, qualitative and quantitative data

Introduction

There is a rich and full set of information gathered on the student experience, both directly from students through surveys and conversations and via proxy measures such as assessment performance, student attendance and complaints. The modern concept of continuous improvement depends upon a number of precursors: an envisioned target; a system under control; opportunities for the collection of student

feedback; and effective communication. The use of evidence in creating a measurable conception of the variance between the current operation of the course and the envisioned ideal is a standard methodology in manufacturing. In higher education this is not a simple task, because a number of the variables themselves remain uncertain.

Two basic postures result. In the first, the information base is viewed as uncertain. Accordingly, academic managers primarily rely on lecturer commentary. The chain of logic is that students do not understand higher education (HE) until they have completed it. Their input is unreliable. At its extreme, student malfeasance (idleness, lack of diligence in study, social orientation) is treated as the primary cause of student difficulties. Staff create a range of mythologies about "their" students which limit responsibility for the learning experience other than providing the minimum context necessary for it to occur. The alternative stance idealises the gathered information as unarguable. Given the lecturer has access to good data throughout the learning process, it is unacceptable to see problems with progression and attainment because these should have been fixed during the learning and teaching activities.

Management by exception is generally adopted for the consideration of module performance. As a result, focus usually falls on modules with statistics falling away from the mean or normal range. The question then is whether the available evidence is sufficient to derive causality. Identification of cause provides the most direct route to improvement.

Evidence

The Evidence Base: Module and Course Operation

A consideration of the standard sources of evidence, derived information and time cycle is given in Table 1 overleaf. The principal point is obvious: there are numerous sources of data on module and course performance available once the module or course has completed its operation; there are limited data sources customarily garnered whilst the course or module is running. Quality systems benefit both from long- and short-term variation data to be most effective and reduce the risks of over control.

The quality of the data sources is variable in content and interpretation. Students often struggle to disaggregate dislike for a topic from the way it has been delivered. Academics disparage the slightest defect in statistical measures, often an issue with mark calculators with student record systems. Mark calculators are usually bespoke developments in standard packages, coding each university's unique rules. Problems include statistical handling of zero scores and non-submissions, and a variety of solecisms arising from rule interpretation. Comments about National Student Survey methodology and results are frequently adverse, though the system only records independently student commentary, and the detailed written supporting information often clarifies well the data outliers.

In spite of the growth of Postgraduate Certificate qualifications in learning and teaching and HEA membership, lack of reflective quality in lecturers' module reports can be problematical.

Variations (however disguised) on "I was good; the students were poor; the students failed" are not difficult to find. An internal survey run on the Business School modules of an established university found two thirds of module reviews in this category (assessor's opinion). If recruitment of an inappropriate cohort can be discounted as a cause, such commentary may highlight problems: lack of understanding of the learning process; a lack of self-confidence, often masked as arrogance; or anticipation of unwanted accountability. The National Student Survey warrants further comment because of its totemic standing in political thinking in the sector. In quality terms it is simply another source of evidence. It garners some information that might not otherwise emerge because it attempts to achieve extensive cohort coverage. The gross numerical figures include a number of elements which reflect considerations other than the learning experience, such as pride in having got to this institution and discipline-specific aspects about how students view themselves. The associated written commentary can be high value, and, although its contents generally reinforce other sources, can give detailed insight into particular sources of dissatisfaction and affection. Its use emphasises the importance of listening to students (Ramsden 2003). Poor response rates to internal student consultations and evaluations feature elements of "survey fatigue". Semesterised programmes may run eight or ten modules, each with a separate feedback form, running alongside university and external initiatives. The ability to generate naturally occurring evidence as a course progresses gives the Year Tutor or Course Leader a more immediate insight into the learning

process. Methods can range from early assessment marks through personal tutor feedback and Module Leader observations.

Table 1 - Sources of Evidence

Primary Evidence	**Derived Evidence**	**Timing of Availability**
Module marks	Distribution data – mean, standard deviation, skew, kurtosis; Relative data – comparative cohort performance in-course and between courses; ANOVA	Post hoc – for the module board or the award board; very traditionally once a year
Student progression and student attainment	Distribution data; benchmark data against competitors	Post hoc, for the award board
Student module commentary	Ongoing unit and course performance	Reactive: as and when the team chooses to ask for it; Proactive: when the students offer an opinion, either directly or through year representatives; Commonly: course committees via students representation
Student module evaluation/feedback	Analysis of commentary against module performance	End of module, typically annually
National Student Survey (NSS)	Benchmarking against competitors; analysis of written commentary	Annually
Student commentary on each lecture or seminar	If private, lecturer/tutor personal reflection; if public, analysis of commentary or in-course benchmarking	During the delivery cycle
Module lecturer/tutor commentary	Adequacy of facilities and provision, analysis of commentary	End of module, usually annually
Year Tutor and Course Leader commentary	Annual monitoring report; benchmarking against previous operation and other courses; explanation of issues/ANOVA	End of session, usually annually
Personal tutor or student counsellor commentary	Module/course commentary within the operating cycle	Proactive: when tutor or counsellor refers issues to a member of the Course Management Team Reactive: as and when the team asks for data
Student complaints	Direct, not derived; principally a source of areas for investigation or concern	Both formal and informal complaints are asynchronous, arriving as the occur

The Evidence Base: Student Engagement

Paraphrasing Gibbs (1998), successful students engage; engaged students succeed. The conventional attainment and progression data offer an indirect measure of engagement. There are more immediate sources available, particularly with the growth of electronic learning methods and use of virtual learning environments. As is summarised in Table 2, these include attendance, tutor and self-performance assessment in tutorials and seminars, marks in coursework and continually assessed activities taken during module delivery, use of the library, use of and time on virtual learning environments (VLEs), scores

on mobile and web-based spot tests, sessions used on (booked or monitored) scarce resources, and attendance and participation in extension or extracurricular activities.

Table 2 - Student Engagement Indicators

Indicator	**Customary Cause**	**Amelioration**
Attendance	Poor organisation, personal difficulties, uninterest, social issues	Make it easy for students to attend; Modules relevant and interesting
Tutorial/seminar performance	Failure to do the necessary work, inability to access resources	Early intervention
Library usage	Limited perception of degree level study	Activities using the facilities
VLE usage	Poor organisation, internet access limitations	Intervention/advice
Early assignment marks	Transition issues to HE, failure to do the work	Attention to transition issues, intervention
Mobile/web/in-class spot test marks	Failure to do the work	Intervention
Booked or monitored resources	Disorganisation	Intervention/advice
Extension activities	Uninterest, social issues, personal organisation	None/advice

The ability to use data warehousing techniques to mine the electronic data, from attendance monitoring systems (increasingly used because of government requirements for Tier four immigrant licences), library systems, VLEs and online activities offers the department the ability to build up a multidimensional vector representation of engagement. Comparison with typical patterns for successful students and failing students gives a means of partitioning clusters of predictive performance, perhaps early enough to allow successful intervention. The ability to avert withdrawal and failure is a key goal for widening participation. It is not simply that recruitment effort is expensive: there is no greater loss than wastage of human potential.

Monitoring student engagement brings the university a difficult issue. The resources to provide personal and remedial support are limited, the system presently request driven, and only those students seeking support are offered assistance. Few institutions will welcome the increased resource burden of an institution-led approach.

Improvement

In order to improve performance, we seek causal relationships. In essence, the goal is to use the available evidence as a guide to likely issues. Table 3 below lists common issues, their associated indicators and interventions used in alleviation of them.

Input (selection) is an obvious place to for problems to arise. It is important that the prerequisites for study for the course are actually met. Perhaps the most unfortunate examples of this occur with basic English language ability with international students. Courses with viability issues attempting to broaden their recruitment base by attracting non-standard qualification entrants present obvious risks unless appropriate attention is paid to transition and the additional support needed to engage successfully.

Assuming well motivated, capable students have been recruited, the base of causal problems relates to course design, module design, assessment design, suitability of facilities, and individual academic performance as a teacher. The matter of student academic performance depends intimately on student engagement, which is normally an artefact of the causal factors listed in Table 3; if poor performance is

the result of some personal issue, it is not amenable to systematic improvement, but only to individual support and intervention which may be outside the ambit of the course team.

Interventions vary; the underlying principles of quality do not. Improvement is the use of data to find causes and the deployment of action to resolve issues: facing the facts, solving the problems.

Aspects of this discussion are focused on measurable evidence and directed interventions. It is beneficial to consider the issue of complaints and comments in the round. This does not consist of formal complaints to the university's systems alone, but the usual informal issues raised by students to academic staff, by staff to each other, and collegial suggestions arising from basic quality improvement activities such as peer observation. Lecturers can and do work together to monitor each other's performance. This may be formalised, by creating groups tasked to attend each other's lectures, and assessment processes such as second marking and internal moderation of assignments. Such activities use materials and delivery as evidence to manage the learning experience, for example to confirm parity of academic standards and ensure required student effort is balanced to the credit obtained in assessments.

Lecturers within discipline groups share similar modules and experiences, so it is not uncommon for informal discussions to lead to attempts to develop new teaching approaches, content changes or even the instigation of new modules aimed at addressing performance and currency issues. Such activities have a direct effect on the student experience, but they are not captured unless reported through the lecturer module monitoring procedures. Lacking metrics for measuring their impact, the importance of these informed and focused interventions is sometimes overlooked.

The evidence base is the key available source of guidance to steer investigations and interventions, whether formal or informal, managed or self-motivated. It ensures the problems fixed are those causing real difficulties, rather than the inevitable anecdotal or "folk lore" issues which thrive in the institutional environment. The Pareto principle (Juran 1999) guides us preferentially to seek out and solve the big problems first.

Using the Numerical Data

Most institutions produce statistical data on recruitment, progression, assessment outcomes and other aspects of student performance as part of annual programme monitoring exercises and for examination boards. The data is rarely pristine which feeds an insatiable desire to cavil on the part of many lecturing staff, even though the data disagrees from their own observations by minutiae well below the bounds of statistical relevance. No doubt the use of arbitrary limits to define "exceptional", or outlier, modules and units has fed this fascination with detail, in that it is easier to quibble over data than explain unusual performance. Care in data preparation and some basic statistical understanding is essential in minimising the associated wasted time.

Numerical data contains a discriminating narrative as to the student experience and staff confidence. The "gotcha" approach to assessment (teach one thing, examine another: why not; it was on the reading list; any good student would have got it …), student disappointment or anger at outcomes, bimodal groupings in a unit – these may speak clearly to a lack of lecturer self-belief, poor communications skills, and cliquishness. The underlying causes are there to be sought once the data reveals a line of enquiry.

Sample size

The idea of expected or usual mark averages (means) and standard deviations relies on the sufficient student numbers to produce a reasonably random distribution, the basic form of which is referred to in statistics as a normal or Gaussian distribution. Optional modules often feature low numbers of candidates. Here marks are unlikely to produce a normal distribution about the mean, and measures like variance and standard deviation are not strong indicators. This limits the merit of formal systems for the use of distribution information. Application of such information requires some degree of understanding of the underlying statistics for effective use.

Table 3 - Issues, Indicators, Interventions and Metrics in Improvement

Issue	**Indicators**	**Course-related Causes**	**Interventions**	**Metrics monitoring alleviation**
Course design	Complaints, poor performance, poor attendance	Too much content	Redesign at stage level to reduce content	Reduction in content, but meeting course design objectives
		Poor scheduling	Redesign the assessment schedule	Assessment workload profile
			Redesign the student attendance profile	Contiguity and timing
Module design	Tutor or student complaints, poor attendance	Too much content	Reduce module content	Reduced module workload profile whilst meeting objectives
		Methods not suitable	Redesign delivery (partial/ground up)	Performance during next iteration
Assessment design	Non-submission	Resources not available, excessive challenge	Redesign to ensure availability of resources and appropriate degree of autonomy for level	Profile of submission arrivals around deadlines; student complaints
	Plagiarism	Range of resources, mode does not allow for a range of sources, poor academic practice by students	Ensure assessment has sufficient range and resources; verify students understand what constitutes plagiarism; imbue good practice	Performance during next iteration
	Mark distributions	Assessment vehicle too difficult or too simple	Redesign to ensure assessment challenge and methods are appropriate to the content	Performance in next iteration
Facilities	Non-submission	Access to, or simply too few resources	Redesign to meet facilities profile, or improve facilities to meet need if essential to course	Performance during next iteration
	Plagiarism	Limited range of resources	Redesign assessment around realisable facilities availability	Performance during next iteration, student resources commentary
	Student complaints	Access issues, too few resources, assessment design relies on lecturer input	Probe reality of problem; check scheduling and viability of extension of facilities; redesign to reduce dependency on tutor input	Student complaints during next iteration
Issue	Indicators	Causes	Interventions	Metrics monitoring alleviation
Lecturer/ tutor performance	Student complaints, student attainment and mark distributions	Inadequate performance	Verify problem is real (not module content or personality clash); management action as appropriate	Student module feedback, student counsellor commentary, course or year team meeting commentary
		Course or module design, delivery and learning design, assessment method and design	Evaluate modules: content, approach, and style; expectations of level; assessment and feedback. Mentoring, monitoring, support, observation, check externality. Management action as necessary	Performance during next iteration
		Student dependency, difficulty in finding lecturer	Check module assessment approach does not require dependency	Performance during next iteration
Personal issues	Problems with attendance, performance, meeting deadlines	Health, mental health	Student counselling services, personal tutor	Early support and recording of extenuating circumstances
		Student disengaging	Advice and guidance from student counselling, personal or year tutor as appropriate: there must be no surprises as to outcome	Forward performance of student

Preparing the data

Any real world data collection will include outliers and aberrations. In order to give consistency and improve the extraction of meaning, preparation of the data is necessary. The sample sizes may be such that use of data is only appropriate as a broad brush pointer, so over preparation is something of a waste of time. The key questions with typical student results data are:

(i) Do we include those students that scored zero in the data? Typically these will have not submitted the coursework or not attended the examination but have not withdrawn from the course. Most universities will do this.

(ii) Do we include the marks of students who did not engage? We could treat the number not engaged separately, as a quantitative indicator of whether the module is, of itself, engaging. This is less common practice

(iii) Do we take out any students with valid extenuating circumstances? This seems obvious, but again is not common practice.

Data preparation requires human intelligence, and introduces the possibility of unconscious bias in selection. As professional researchers, deliberate, or conscious, selection bias is less likely with academic staff. Put cynically, if so inclined there are easier opportunities for an examiner or assessor to weight the system outcomes.

Distributions

A well-run honours degree course under CNAA regulations during the 1980s would expect a module to deliver a mean (average) mark of around 55% and a standard deviation of 12. This presents a normal curve with an average performance in the 2.2 band, limited numbers of failures and limited numbers of firsts. Such a performance in most universities at present would indicate difficulties, with NSS data indicating 70% and more of students now attain 2.1 or 1st class honours in many reputable institutions. For a normal distribution this is more indicative of a mean of above 65% and smaller standard deviation if the number of 2.1s is to exceed the number of 1st class awards. More realistically, it indicates a skewed distribution which is not normal (Gaussian) in shape.

Distributions can be made from time-bound data (i.e. this year's cohorts) or can be compared across time. The Open University has a highly regarded system of comparison throughout the lifetime of a course, but also has sufficient numbers on units to make formal application of distributions meaningful.

A distribution with limited numbers of students can only serve as an indicator. The opportunity to identify and interrogate the operation and methods in modules with mark distributions lying well away from the institutional norms for the cohort, course or discipline is basic good practice in quality terms. Repeated disparity is a managerial issue that may speak to problems in selection, transition or preparation of students, or in course design.

Although this discussion focuses principally on course level analyses, there are implications for the ways in which marks are aggregated to ascertain awards. Yorke (2009) discusses in some depth the implications of distributions in the individual classification context and arrives at a less than positive conclusion as to their probity.

Distributions are conventionally used in quality systems in the form of control charts. These are visual indicators which map the mean and variance of input data as the measure of performance. On a numerical basis, analysis of variance (ANOVA) can be used to indicate the significance of differences between distributions. Because there is no expectation of group differentials, the statistical approach of application of F-tests, Tukey, and numerical analysis is not common. The customary approach is in the form of analysing areas where variance from expectation has occurred, and seeking causal relationships from events rather than group class.

Using the Qualitative Data

Many of the specified attributes of graduates of a course are essentially qualitative. The use of learning outcomes, skills outcomes and practical aptitudes in module descriptors makes an attempt to disaggregate these for implementation and assessment purposes. Well-written outcomes are designed

for measurability. Quantitative data (marks, grades) are used as the proxy measure for the disaggregated parts.

Qualitative data derived from student comment and opinion has the merit of reflecting the recipient of the learning's experiences. It lacks, in most cases, the benefit of perspective and comparison, because the student has nothing with which to compare in similar levels of study. Calibration, therefore, is a significant issue.

Disappointingly, the equivalent data derived from tutor/lecturer comment often suffers from a lack of objectivity. For all the research training an individual may have received, the ability to perceive oneself as doing an ordinary, or indeed a poor, job suffers from the psychology of being a lecturer, the feeling of the right to stand in front of others and "educate" them. Anecdotally, few lecturers regard themselves as less competent than the worst educators of their own undergraduate experience.

Elements of Professional Qualitative Data

The courses universities run, in general, lead to participation as professional practitioners in the discipline of study. Opinions from employers of course graduates and other practitioners with whom they work are an evaluation of how well the course fits this purpose.

Opportunistic elements

- Consideration of the various elements of assessment undertaken during the course should show the characteristics of the course's expected outcomes;
- If a final individual or group project is included, the students' conduct of the projects and their outcomes should show the attributes of the course;
- The opinion of lecturers and tutors as to an individual's assimilation of course attributes;
- Commentary from external sources if workplace-derived or as-live projects are included in the course;
- Commentary from employers of the course output graduates if such external inputs are included in course advisory panels or garnered during visits

Designed elements

- Narrative arc built through assessment elements in the final year;
- Final project, dissertation, display or collection (equivalent to the ancient "apprentice piece" concept) as appropriate to the discipline;
- Individual or small group tutor relationship;
- Feedback elements

Qualitative Change

Disaggregating the holistic view of the processes that make up a discipline practitioner or a discipline professional yields a number of aspects that one might expect to see change over the duration of study:

(a) A transformation in the students' understanding of the discipline. This should be evident in the quality of assessed work and the nature of the feedback provided by tutors;

(b) The development of the core technical skills of the discipline, which is evidenced in the practice arc of the course;

(c) The assimilation of professional/practitioner attitudes and confidence, and evincing an appropriate synergistic view of the discipline. This is seen in tutor and personal tutor commentary; and

(d) The adoption of behaviours appropriate to lifelong learning and professional updating, seen in reflection on performance and participation (attendance, interest, contribution) in the peripheral and extension activities taking place around the course.

Where study takes place in the workplace, a fifth element can be added:

(e) Significant change and improvement in professional/practitioner performance. Whilst higher education is not training, it is reasonable to expect the outcomes of learning will enhance performance.

This evaluation is perhaps where the course learning outcomes, included as mandatory in most universities' course validation documentation, provide a potential metric set for assessment of impact. The authors of this paper have variously worked and studied in eight UK universities, and have been involved as external advisers in validations with a further twelve. In none of these has any overt use of course learning outcomes been seen to be made in monitoring and quality improvement.

Qualitative Data: Are We Meeting Expectations?

NSS has thrown into stark relief the business of the expectations on both parties in learning. Academic staff use their expectations as a part of their design of courses, modules and assessments. Explicitly or implicitly, this is the aspect of being a "learning professional". Students equally bring a range of expectations to HE. Practical experience shows these are diverse, ranging from simply more of the educational process and style they received in school through to a student-centric practice led environment or some romanticised view of a 1930s Oxbridge tutorial relationship. Unfulfilled expectations might be one of the keys to improving student perceptions. Yet expectations are fluid. Their achievement may be as much in setting them in an achievable range as in delivery of some perfect system.

Setting explicit and limited expectations at a module and course level is a communication issue; setting expectations on assessment has the more direct option of aligned assessment (Biggs 2003). Robinson and Udall (2006) implemented this as the concept of aligning the students' understanding with the tutor's expectations as part of the learning process in a variety of ways, including marking grids (Rees and Robinson 2012).

Collection here is less easy in terms of naturally occurring evidence. For example, it is unlikely students will think to comment on the excellence of the alignment process for a particular module, and generally meeting expectations is more likely to generate a "warm glow" (better NSS outcomes in the round) rather than any analysis. It may require addition of a direct question to standard end-of-module student feedback requests or inclusion in per-lecture feedback where this is garnered.

The use of the evidence is subject to the duality of the question: met or set? Clinton (2009) suggests the idea of the psychological contract as in workplace studies (Rousseau 1995) is a key part of expectation satisfaction. An improvement action can be a matter of content and delivery change or of more robustly establishing for the module or course the learning contract of exchange.

Conclusion

Garnering a rich set of data concerning the course during operation and on how it operated once completed delivers the sources of information to drive change and continuous improvement. It is an aspect of care for the student experience and learning. The information is key to the enhancement of the ability of academic practitioners to support learning. Methodical processes which use the expertise of the course leader and course team provide a framework to buttress enthusiasm with evidence, and help to filter the reality of learning from unsubstantiated opinion and folklore beliefs.

How, then, to prove learning is effective? As has been illustrated, the majority of measures are proxies based on the application of learning: performance in assessments; opinions of tutors based on performance in discussions, seminars and tutorials; opinions of employers of graduates of the course; behaviours as practitioners during study periods; learner opinion; the degree to which alignment of perception agrees with what our academic experts define as correct thinking. Objectivity is at something of a premium here – we set the assessments; we run the discussions, seminars and tutorials; employers precepts for excellence may be utilitarian and specific; learner behaviour and perception is created to some degree by the opportunities offered to then; we, as academics, agree what is "correct". Yet, as Holroyd (2000) discussed, this is little different from the experience of other complex and sophisticated services, and quality systems are designed with these effects in mind.

Systematic, evidence-based improvement requires three things: an individual or small group who own the process and take responsibility for enhancement; a course team that cares about the quality of the graduates they produce and will change approach to improve; and a willingness to put the necessary time into gathering and evaluating the evidence. This is mainstream quality thinking. As Edwards Deming (2000) and many others have observed an expert and interested team, working to an excellent design, operating the right monitoring processes and assiduous in making improvements, will produce superior products. Academics face challenges beyond those of most production and service delivery environments, not least that the students have to opt in to the change processes. But the core approaches remain: excellence in design and evidence-based continuous improvement are the foundations of a good student experience.

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