Teaching in Higher Education
Vol. 12, No. 2, April 2007, pp. 157–170

Routledge
Taylor & Francis Group

Evidence-informed pedagogy and the enhancement of student employability

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Claims are frequently made that practice should be based on evidence. However, the nature of what should count as 'evidence' depends on purpose and context. In the case of curriculum development, decisions may rest on local and provisional evidence. This article takes an area of contemporary political interest—enhancing student employability—and illustrates the point with two examples of the use of survey methods for pedagogical purposes.

Evidence for practice

The call for practice to be based on evidence has resonated round a wide range of professions. Sometimes the evidence base is 'hard', and robust generalisations are justified on the basis of adherence to strict experimental criteria. However, in higher education and in the social sciences generally, the evidence base is more contingent. Educators cannot simply apply evidence without taking into account the circumstances in which it was created and in which they operate: they have to make evidence-*informed* professional decisions regarding their practice. From this standpoint, there are difficulties with a 'strong' view of evidence-based practice because certainty and generalisation can only be provisional (see for example Davies & Nutley, 2001; Knight, 2006). Yet, as enquiries relating to the scholarship of teaching repeatedly demonstrate (for example, Kreber, 2001; O'Meara & Rice, 2005), considerable local benefit can be had from research that is intended to be illuminative or formative, data are contingent and professional expertise needs to be applied to them. This is consistent with Volkwein's (1999) distinction between studies of this kind and research that is carried out for external (and to some extent, summative) purposes—i.e. what would typically be subsumed under 'educational research' in its most rigorous sense. An analogy can be found in the field of assessment, where formative assessment may lack the reliability that is expected of summative assessments, but engages the tutor and student in constructive and fruitful dialogue.

Internally focused questionnaires (and other modes of inquiry, for that matter) can be useful probes into the issue of interest, provided that they are seen as generating

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ISSN 1356-2517 (print)/ISSN 1470-1294 (online)/07/020157-14

DOI: 10.1080/13562510701191877

evidence to open up the issue formatively rather than as producing definitive, summative evidence. In this article we draw on our experience of working, as members of the Enhancing Student Employability Co-ordination Team (ESECT), and illustrate our argument (which we believe has a relevance beyond the specific arena of employability) by presenting evidence from two substantial questionnaire studies.

Employability: a matter of international relevance

Governments around the world are concerned that higher education makes the greatest possible contribution to 'human capital', the quality of which is believed to be crucial to national well-being. The development of graduates' employability is seen as vitally important, and this political concern was reflected in the establishment of ESECT in England (whose output can be accessed via www.heacademy.ac.uk/869.htm) and also can be seen in Barrie (2004), Bowers-Brown and Harvey (2005), DEST (2002), Hager *et al.* (2002), Harvey (2002), Leadbeater (2002), Nguyen *et al.* (2004), Rao and Sylvester (2000), Reich (2002), Sheckley *et al.* (1993), and SHEFC (2004), amongst other sources. We interpret 'employability' in terms of a graduate's (or other awardee's) *suitability* for appropriate employment. It is quite different from actually *getting* an appropriate job, which is dependent on factors such as the state of the economy and patterns of discrimination in the labour market (Linke, 1991; Yorke, 2004).

There is a range of responses by higher education to this concern for employability. Some worry that employers' intentions will lead higher education away from its pursuit of truth. Others doubt the validity of human capital theories that are often associated with an interest in employability. Whereas those theories claim that national wealth and well-being are associated with what a country's people know and can do, rival views put greater explanatory weight on structural features of national economies and cultures. Predictably, some academic staff are indifferent, treating employability as a fad. Some are more positive. One reaction looks to the co-curriculum (careers guidance, optional activities and extra-curricular opportunities) as a way of helping students to gain 'skills'. Another, which we favour, has been informed by evidence of what employers claim to be seeking when hiring new graduates, as well as by research into human learning, self-theories, efficacy beliefs, metacognition, practical intelligence and self-regulation. Employability is seen in terms of four broad student attainments:

- evidence of powers of *understanding*, typically in the form of a good first degree;
- what are often called '*skills*', both general and subject-specific, and implying the capacity to use them appropriately in context;
- *efficacy beliefs* and other personal qualities; and
- *metacognition* (the term 'reflection' is often used to describe similar practices).

ESECT argued that, in order to enhance employability, it is necessary to ensure that practices that foster these achievements are in place in whole degree programmes, and that both staff and students know how achievements arising from them can be represented effectively to employers. It recognised the part played by careers services and other co-curricular provision, but said that the whole curriculum had to be treated as the prime means to enhance student employability. Some support for this position has emerged with the demonstration of Pascarella and Terenzini (2005) that many of higher education's effects are the product of the whole experience of being a student.

Valuable though it was to have research evidence on which to base both a stance and advice to universities, we cannot claim that ESECT's panoramic, research-informed account provided more than a partial and provisional foundation for the enhancement of student employability. To some degree its limitations reflect uncertainties, even in such well-developed areas of enquiry as self-theories. The account is also strongly coloured by the expert but non-objective processes of synthesising a wide range of research evidence in order to address specific problems—what is employability and how might it be enhanced through higher education? ESECT recognised the need for further work to 'infill' where academics identified the need for evidence on which to base local curricular change—evidence that could not be provided at national level. In the rest of this article we take two aspects of employability and exemplify the way in which localised research could provide the more extensive evidence that curriculum leaders may require.

Two aspects of employability

If they intend to put their employability-enhancing work on an informed footing, programme leaders might want to have some appreciation, inter alia, of the degree to which students have a robust sense of self-efficacy and of the degree to which students report the programme to provide experiences that are associated with making strong claims to being employable in graduate jobs. These aspects are developed in this article. Other points on which team leaders might want better evidence are:

- the degree to which assessment arrangements are compatible with employability enhancement (see www.esect.co.uk/tools/assessmentanalysistool.php for an assessment analysis tool), and
- the design of the curriculum as a whole (see www.esect.co.uk/tools/tuning%20 tools.php for a curriculum tuning tool).

Self-efficacy and related matters

Some curricula in the humanities and social sciences have, as a consequence of their subject discipline(s), explored concepts of the self and its development. However, matters such as motivation (Pintrich & Schunk, 1996), self-efficacy (Bandura,

1997), and self-theories (Dweck, 1999), which have been extensively researched in the fields of cognitive and social psychology, are sparsely represented in many curricula.

Personal qualities pervade employability: an appropriate personal manner, for example, is an asset in any situation involving interpersonal contact. Less immediately visible are qualities such as the disposition to get things done, the taking of initiative, and the preparedness to stick at difficult tasks. We have found from interviews conducted with 97 newly employed graduates and 117 of their more experienced colleagues that these qualities 'count' (Knight & Yorke, 2004). Personal qualities are also influential in both the acquisition of subject understanding and the development of skills. A willingness to learn (often from mistakes) implies a preparedness to tolerate some kind of stress in order to achieve success (which, for some, may simply be not failing). Our general claim is that discussions of employability are transformed by the inclusion of personal qualities and, our specific claim is that pedagogic practices may be enhanced through research bearing upon efficacy beliefs and self-theories.

With reference to relevant literatures, we designed, constructed, piloted, revised and administered two questionnaires designed to provide information on these two topics. The intention was to create questionnaires, using educational research methods to ensure a reasonable level of robustness, that would provide evidence that could inform the practical decision-making of students, teachers and curriculum leaders.

ESECT took the view that it was important that students should (where appropriate) be encouraged to develop higher levels of self-efficacy (broadly, the confidence that one can, on balance, 'make a difference' in situations through persistence and strategic thinking) and to develop their awareness of the significance of malleability in self-theories. The self-efficacy questionnaire (SEQ) was designed to enable teachers to gain a broad appreciation of the general disposition of the students in their classes. It can, of course, be used by individual students, provided that they get appropriate feedback on the scores.

The employability experience questionnaire (EEQ) has a similar purpose, although in this case the focus is on students' perceptions of aspects of their curricular experiences that bear the enhancement of their employability. EEQ is intended to allow curriculum leaders to make adjustments to ensure that classes' learning experiences are orchestrated to optimal effect. Since the development of employability, for many students, takes place over the duration of a programme, it makes sense for curriculum leaders to take a programme-related perspective to the students' responses to the EEQ. The EEQ, when completed as an individual exercise by individual students, could be used to draw their attention to a variety of experiences that could assist them in making claims for their employability, and hence could make a contribution to personal development planning (PDP).

The self-efficacy questionnaire

Taking the view that self-theories in their broad sense are important influences on performance, we developed a short instrument (short, with an eye to practical utility) which would reflect some key theoretical constructs. In addition to a set of demographic items, the SEQ included 19 items that consisted of a stem statement with four forced-choice response options (strongly agree; tend to agree; tend to disagree; strongly disagree).

Sixteen items covered aspects of self-efficacy: eight items concentrated, in various ways, on locus of control, six reflected motivation and two reflected the expected connection between effort put in and the outcome. These items were divided into two sets of eight, one set referring to experience within higher education and the other to experience in the wider world. The fixedness–malleability dimension of self-theories was reflected in three items based on Dweck's (1999) work.

A pilot run, using the instrument with some 700 students, suggested that the items did reflect the underlying constructs. We then administered the SEQ in a slightly revised form to 2269 students in five universities in north-west England, four of which were participants in the Skills *plus* project (see Knight & Yorke, 2004). The respondents were an opportunity sample of first- and final-year students (except for a group of third-year students from a four-year programme), who were studying a wide range of subject disciplines.

During manual entry of the data we noticed that a number of students had crossed out one or more ticks and selected a different response category. A check, using a random sample of 417 of the 2269 responses, showed that 119 of the students (28.5%) had had second thoughts about at least one of their responses, suggesting to us that they were taking the SEQ seriously. Where it can be undertaken, an unobtrusive check of this sort would seem to have a wider utility in work of this kind.

The clarity in the pattern of results from the pilot work was not maintained in this larger study. Four of the self-efficacy items exhibited unsatisfactory statistical properties and were therefore discarded, as was one of the three self-theory items.

We decided to keep separate the two sets of self-efficacy items (six relating to higher education and six to the wider world). There were few differences of note between the disciplinary and institutional sub-groups, and for the purposes of this article the data from the respondents are not sub-divided. Exploratory factor analysis (principal components, with varimax rotation and using pairwise exclusion) of each set suggested the factors shown in Tables 1 and 2.

Factor analysis of the responses to the six remaining 'in-HE' items produced a three-factor solution that accounted for 61.6% of the variance. The loadings in excess of 0.30 are given below, and the three factors reflect (I) engagement in learning; (II) the impact of luck and/or effort on achievement; and (III) personal control.

A similar analysis of the six remaining 'wider world' items also produced a three-factor solution accounting for 61.1% of the variance. The factors can be labelled as follows: (I) the impact of luck and/or effort on achievement (although the last item in

Table 1. Factor analysis of the 'in-HE' items, showing loadings in excess of 0.30

Item	Factor I	Factor II	Factor III
The academic tasks I am set motivate me to put in quite a lot of effort.	0.58		
The amount of work I put into my studies is reflected in my grades.		0.65	
Luck doesn't play much of a part in what I achieve academically.		0.83	
As a student, I like learning situations in which I, rather than the teaching staff, can shape the work to be done. R			0.96
I find that academic work doesn't stretch me intellectually. R	0.77		
Higher education doesn't give me much of an opportunity to develop new skills. R	0.72		

Numbers of responses per item ranged from 2249 to 2263; Items were scored Strongly Agree = 4 to Strongly Disagree = 1; R indicates that the scoring of the item was reversed.

the table seems rather different, and could have made a fourth factor on its own); (II) engagement; and (III) personal control.

The two factor analyses come up with broadly similar solutions, suggesting that there is some commonality in self-efficacy whether the focus is on studies in higher education or action in the wider world. This might be interpreted in terms of a general personal tendency as regards self-efficacy but, as Bandura (1997) makes clear, this may be overridden by particular contextual circumstances.

There were some interesting responses at the level of the individual item that are hidden in the outcomes of the factor analyses. The minority who believed in the influence of luck in what they achieve within higher education was close to one in three, yet this contrasted with a generally stronger belief in the value of effort in

Table 2. Factor analysis of the 'wider world' items, showing loadings in excess of 0.30

Item	Factor I	Factor II	Factor III
In life in general, I am stimulated by the challenge of difficult problems.		0.79	
I don't let other people determine the way I tackle what I do outside higher education.			0.96
The tasks that people outside higher education expect me to undertake usually energise me to work hard at them.		0.74	
In the things I do outside higher education, I find that there is not much of a connection between what I achieve and the effort I put in. R	0.69		
Chance will probably be influential in what I achieve in employment. R	0.69		
I don't like situations in which I, rather than others, am responsible for what happens. R	0.62		

Numbers of responses per item ranged from 2245 to 2264; Items were scored Strongly Agree = 4 to Strongly Disagree = 1; R indicates that the scoring of the item was reversed.

determining grades. A similar minority tended to believe that they had little control over what they do within higher education—this may reflect an understandable acquiescence to the assessment system. However, for these students the pedagogic ideal of developing their autonomy may not yet have been realised. The power of luck as a determinant was more marked in responses to the comparable 'wider world' item, with a majority tending to agree that chance would be influential in their achievement in employment. If this is not a methodological artefact, then it should cause concern for those who want to encourage students to see that they 'can make a difference' in employment or more broadly in society. A large minority of respondents tended to exhibit a supine stance in respect of the wider world, which again might create a ripple of pedagogical concern.

The 'self-theories' responses

The two remaining items derived from Dweck's (1999) work were treated separately in the analysis, and the overall student responses are given in Table 3, dichotomised to indicate whether the tendency was to agree with the item (TA) or to disagree (TD)

Table 3 suggests that nearly one in three of the student respondents possessed self-theories that had an element of 'fixedness'. As with all questionnaires, much depends on how items are interpreted. 'Intelligence' is not unambiguous as a construct—Gardner (1983) and Hedlund and Sternberg (2000), for example, point out its multidimensionality. However, a perception, albeit a minority perception, that intelligence is essentially fixed and not particularly malleable has implications for student learning (and, by extension, to teaching in higher education: see Yorke & Knight, 2004). The perception may be of particular significance for students—often from disadvantaged backgrounds—who lack confidence that they have the ability to succeed in higher education, and who may not have been exposed to the supportiveness that is implicit in the valuing of 'practical intelligence' (Sternberg, 1997; Sternberg & Grigorenko, 2000).

Reflective commentary on the SEQ

Item quality. The responses to the administration of the revised version of the SEQ showed that the structure of the results was less well defined than the piloting had suggested.

Table 3. Responses to two items relating to self theories

Item	TA (%)	TD (%)	*N*
An individual can't change their intelligence by much.	28.5	71.5	2239
No matter what kind of person someone is, it is always possible for them to change significantly.	70.7	29.3	2259

The causes may include the following:

- changes to the wording of items as we sought to refine them;
- interpretive variability, perhaps deriving from different groups of students and/or from differential interpretation of the context to which the item referred; and
- item ambiguity not identified in earlier runs because of the apparent satisfactory psychometric quality of some items.

Optimising the questionnaire's size. We wanted a short instrument that could provide 'markers' relating to self-efficacy and self-theories, and hence we kept the items down to 19 in number. We now have two sets of six (in-HE and wider world), plus the two self-theory items, which are too few for a research instrument, but have pragmatic value in pedagogical development.

One option might be to decouple the 'in-HE' items from those referring to the 'wider world', and to develop a greater number of 'in-HE' items whose purpose would be to provide a stronger basis of evidence that could assist the development of pedagogic approaches. This would mean altering the focus on single-issue items (collapsing into three factors, as shown above) to something closer to a small collection of psychometric scales. Our work on the EEQ (see below) indicates that relatively short scales developed in the light of the three-factor solution reported in Table 1 could have adequate reliability for pragmatic pedagogical purposes.

The employability experience questionnaire

The EEQ was developed with reference to a number of facets of higher education that were explicitly or implicitly subsumed by the USEM account of employability. Piloting with some 1400 students in four institutions indicated the need for some revision, and a revised version was used with opportunity samples totalling 2072 students in seven varied institutions. In addition to a number of demographic questions, this version of the questionnaire contained 31 items which invited responses on a five-point scale running from 'strongly agree' via 'neutral' to 'strongly disagree'.

The responses from different student groups exhibited sufficient commonality to justify treating them as a unitary collection. As with the SEQ, some items turned out to be unsatisfactory on various technical grounds, and eight were discarded from the analysis. Exploratory factor analysis (principal components, varimax rotation, with pairwise exclusion) based on the remaining 23 items suggested a five-factor solution accounting for 49.0% of the variance (Table 4).

The strongly loading items on the factors can be treated as short scales for the purpose of summarising the responses, and labelled as in Table 5 (where there are missing responses, the use of the *mean* score for the scale avoids the more severe distortion of simply summing those item scores that happen to be present). The scale

Table 4. Factor analysis of the 23 EEQ items, showing loadings in excess of 0.30

Item		Factor				
		I	II	III	IV	V
The teaching on my programme of study has encouraged discussion.	S					0.68
The teaching on my programme of study has helped me to think critically about my subject.*	S					0.72
This year's work requires me to be more independent than last year's did.	S					0.61
Experience of the work environment has helped me to focus my academic studies.	S	0.72				
I have a broad understanding of my subject area.*	S		0.63			
Workplace experience has enabled me to become more confident in higher education. R	S	0.73				
What I have learned in the workplace has helped me in my academic studies.	S	0.82				
I am not sure what subject-specific* skills I can claim to have. R				0.64		
I understand how I learn most effectively.			0.61			
In my academic work I have been able to apply skills that I have developed in work environments.		0.61				
I feel confident in my academic work.	S		0.73			
Whilst in higher education I have learned some strategies that help me to succeed on novel problems.			0.49			
I have become skilful in my subject specialism.*	S		0.66			
The work experience I have had has made me think about what I need to do in my studies to develop a graduate-level career.		0.54				
I have not been encouraged to consider how the things I do outside the formal academic programme can provide evidence in support of graduate-level employment. R				0.57		
I am not sure what subject* knowledge I will need for my preferred future career. R	S			0.68		
I know what general skills employers expect of graduate-level employees.					0.49	
I do not know the extent to which my current capabilities fit the expectations of graduate-level employment. R	S			0.72		
I find it hard to assess my strengths and weaknesses as a competitor in the graduate labour market. R	S			0.66		
I have enhanced the general skills that make people effective in employment.					0.52	
I can provide an employer (or other interested party) with evidence of my general skills.	S				0.68	
I have built up a portfolio of evidence of my achievements.	S				0.67	
I expect that I will be effective in a graduate-level job.	S				0.60	

Numbers of responses per item ranged from 1647 to 2027; R indicates that the scoring of the item was reversed from Strongly Agree = 5 to Strongly Disagree = 1; S indicates that the item could be used in a shortened form of the EEQ (see text); The asterisks indicate that, where appropriate, respondents should have related the item to their main subject in a joint or combined programme.

Table 5. Factor labels and associated scale reliabilities for the EEQ

Factor	Label	Scale reliability (Cronbach alpha)
I	Valuing workplace experience	0.77
II	Academic awareness	0.72
III	General awareness	0.69
IV	Employment orientation	0.68
V	Critical independence	0.55

reliabilities, with the exception of 'critical independence', are adequate for formative purposes, though would preferably be higher for formal research use.

Reflective commentary on the EEQ

Item quality. A number of items were discarded or amended as a result of the pilot administration, but the revised version still showed some weaknesses in psychometric terms.

The 'critical independence' items are the residue from a larger number based on the theme of autonomous activity. The set of original items rather surprisingly exhibited weak internal relationships and had relatively weak statistical properties. The correlations between the three remaining items were still low, which is reflected in the low Cronbach alpha for the sub-scale. Critical independence is the main area of the questionnaire that stands in need of further development, whether or not the intention is to develop a scale.

A number of negatively worded items appear together in Factor III, which is a weakness noted in the Course Experience Questionnaire (CEQ) (Richardson, 2005, p. 394). This leaves open the question of whether the factor has been influenced disproportionately by linguistic considerations—as perhaps might those factors made up mainly of positively expressed items. Further work with a larger pool of items, some expressed in positive terms and some in negative terms, seems needed.

Factor analysis. The variance explained by the analysis is lower than is desirable—about half of the variance in the responses lies outside the ambit of the five factors. There are two inferences here, which are not mutually exclusive: first, that the ground covered by the items has a greater dimensionality than is covered by the extracted factors; and, second, that an improvement in the items might strengthen the current factor structure.

Scale length. Where, for practical reasons, a shorter instrument is required, the items marked with an S (Table 4) can be used, as further analyses show, with very little weakening of the scale reliabilities.

Discussion

Why not formal scales?

Some might ask whether the SEQ might be treated as a self-efficacy *scale*, giving a measurement of individuals' perceived self-efficacy, and the EEQ be used as an employability experience *scale*, which would allow rankings of provision to be compared across programmes—and even institutions, in a manner broadly similar to with the use made of the CEQ in Australia (see Ramsden, 1991 and subsequent articles on the CEQ).

In both cases we took the view that it was desirable to construct diagnostic questionnaires but not to develop scales and similar instruments that purport to provide *measurements* of self-efficacy or of employability experience, since a 'measuring instrument' requires assumptions that we felt were untenable. (In passing, our work demonstrates that the designing of a satisfactory questionnaire is a more demanding activity than seems sometimes to be thought.)

We are sceptical about the degrees of certainty that can be claimed when the phenomena in question appear to be protean, and we agree with Bandura's (1997) argument that self-efficacy is strongly influenced by context. Regarding self theories, Quihuis *et al.* (2002) argue that Dweck's (1999) dichotomous position regarding them is limited, being based upon forced choices that classify students into one of two categories of implicit belief. They argue that it is possible to hold both fixed and malleable beliefs simultaneously and to apply different implicit theories in different academic domains.

As for employability, it inheres in persons, environments, experiences and affects. Furthermore, employability is relational, in the sense that however employable students feel themselves to be, they are actually employable to the degree to which there is employer demand for the achievements to which they lay claim. Consequently, we do not see how it would be possible to construct any instrument to describe the totality of a person's employability. *It is, however, feasible to construct questionnaires that prompt students to reflect on their employability, take action to enhance it and consider how to make strong claims to being employable.*

The relationship with theory

The relationship of the items with theory is more complicated than our pilot work had led us to believe. It seems likely that, in practice, a respondent might be implicitly coming at the item from a different implicit theoretical standpoint than we, as item-writers, did, and that different respondents were operating from different implicit positions. On reflection, this 'over-determination by theory' seems to be an endemic problem for questionnaire work, and leads us to wonder whether some instruments are as robust in reality as they are purported to be. It is perhaps one of the advantages of the production of a 'psychometrically correct' scale that a multiplicity of convergent items allows a definite 'centre' of the scale to be identified: the problem, though, can be an inappropriateness for some practical purposes (in our

case, for informing pedagogical approaches). For example, it is rarely feasible to use a psychometrically sound, but lengthy, instrument as a basis for some tutored reflection regarding students' self-awareness (and one still has to bear in mind the ethical issues relating to disclosure and handling potentially sensitive data). Further, it is not certain that there is always a close resemblance in terms of experience, assumptions and constructs between the sample with which the scale was validated and the samples with which it is used, with potential risk to the scale's validity.

Professional judgement

In taking the line that self-efficacy and employability resist *measurement* (but not other forms of description), we are setting out a special case of the general position that we have taken (Knight & Yorke, 2003), namely that there are many educational achievements that defy summative assessment, unless the level of resourcing is enormous—and then the act of measuring can destabilise what is being measured. Of course, people can claim to make acceptably dependable judgements on complex achievements but we suggest that the judgements may be less valid and reliable than the judges suppose.

If the desire is to develop and validate psychometrically robust scales where an argument can be made for the stability of the construct under investigation, there are significant costs associated with development and testing.

In reporting the development and use of two questionnaires connected with the complex concept of employability we have not only provided findings of interest to those concerned with employability, but have also argued that employability cannot be measured, although valid, learning-oriented data can be collected via questionnaires (and also, we readily acknowledge, via other methods) for the benefit of students, teachers and curriculum leaders. Put another way, our work recognises the role of professional judgement in the ways in which the development of employability is approached—and we would extend the point to cover pedagogy in general.

Our view is that, whilst there are general pedagogical findings and principles that command broad assent, they have to be tempered with respect to more local circumstances. Faced with a particular cohort of students following a particular subject in a distinctive university, teachers and curriculum designers need to consider how findings about students *in general* might stand in relation to *these particular* students. We have described instruments that help local decision-making, thereby complementing the general principles ESECT proposed for pedagogic practices that favour the development of student employability. We would want local practices to rest on the tectonic plates of research, theory and other generalisations but local landscapes will vary and their shaping should be informed by deliberations on evidence created by tools such as the two questionnaires we have described.

The judgements and decisions educators make should be *informed* by evidence, which will often be local and provisional evidence.

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