

A Competency Framework Methodology and Implementation

Ken Currie, February 2018

Competency Frameworks (CF) are relatively commonplace though they are generally used as a model, or blueprint, for measuring performance within an organisation or sector. It is less common to find CFs used to align educational curricula to an industry or sector framework. There are examples, but it is hard to find examples in higher education.

A CF defines the knowledge, skills, and attributes needed for employees working within an organization. Individual roles will have their own set of competencies that are used to measure whether an employee is effective in performing the job that maps to this role. Generally, the CF will be defined in terms of a number of competencies, which can be generically applied to a broad number of roles within the organisation or sector.

It has proved difficult to work out how to actually define, use and report on the use of a Competency Framework (CF) within an overall academic programme, such as the MBA. However, I now have well-formed thoughts about how this might work, and what methodology could be adopted to support this in action. This report outlines such a methodology, implemented within a Moodle framework as a reference. However, it is a general methodology and not necessarily specific to Moodle.¹

After a fairly detailed trawl of the available literature I was amused to see a [USAID report](#) offering details of their pharmaceutical curriculum mapping exercise:

"The curriculum mapping exercise was guided by an SPS human resource consultant with an illustrative presentation and step wise instructions.

The key steps are as follows:

- *Step 1: Identify the competencies that graduates should have by the time they complete preservice education*
 - *Step 2: Review the curriculum against the competency requirements"*
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Rather obvious, maybe, but perhaps this is exactly what such a mapping exercise is about – and should be about.

To implement competency-based education and assessment, competency frameworks must be connected to curricula, learning resources, and assessment data. To be able to do this there has to be a mechanism (and tools) for capturing the definition of a CF –

¹ Blackboard Alignment does similar, aligning 'goals' within 'professional standards'.

generally a hierarchical structure – and for assisting the mapping of competencies to learning content and assessment.

One mechanism could be the MedBiquitous Competency Framework, [ANSI/MEDBIO CF.10.1-2012](#), which is an open technical standard for representing competency frameworks in XML. Organizations that publish competency frameworks can do so in this standard format, making it easier to integrate competency frameworks into educational technologies such as curriculum management systems. This standard allows medical schools and other health professions schools to connect their curriculum, learning resources, and assessment data back to a common set of competencies. This is a goal, as it ultimately enables competency-based views of the curriculum and of learner performance.

While a huge advocate of the use of XML, this representation is perhaps overly simple (though a CF does not actually need to be complex) so for the sake of easy implementation I decided to base the methodology directly onto existing CF structures, namely those within the reference environment of the pilot implementation – Moodle. It would be a relatively simple exercise to map an XML representation to Moodle data structures, and vice versa.

1. Moodle and its Competency Framework implementation

Moodle introduced CFs some time ago, complementing the earlier notion of Learning Plans (LP). Individual Learning Plans had been introduced to the support and delivery of personalised learning, thereby providing students with additional opportunity to manage and track their own progress.

Once a CF has been set up, an LP template can then be created. An LP template defines a set of competencies that allows a course developer to personalize instruction through individualized learning plans, though these are generally assigned to a group of users. LPs are not limited to a single course, as they are more useful when creating learning plans that cut across a set of courses, e.g. within a programme of study such as an MBA.

Competencies² are added to a template to create a template, but the LP is equally useful in showing which competencies are not currently assigned to, or aligned with, any course.

The LP also shows all Competencies that have been met by a student and the course competencies screen shows where some are still incomplete. As Competencies exist outside of a course, then a Competency may have been met in course other than the one you are currently studying, i.e. in another part of the programme.

Moodle 3.2 onwards implements the two key concepts of:

- **Competency Frameworks (CF):** these are documented [here](#) though it is also necessary to read their interpretation of [Competencies](#) to fully understand how this feature is intended to be used.
- **Learning Plans (LP):** once a Competency framework has been set up, you can then create a learning plan template, which defines a set of competencies which you can assign to a group of users.

There are some very useful features in both of these new activities in Moodle, though the notions of ‘competency’ and ‘competency framework’ are weak and - as is normal for Moodle – are very course oriented.

It is certainly the case that any CF will tend to be used across a number of courses, for example a management CF could cover an MBA as a whole, with competencies contained within, or shared within, the component courses. Within this vision, any single course will only relate to a subset of Competencies within the CF.

² The term Competencies (with a capital C) is used as a general term for entries in a CF. Some models use ‘competencies’ as a component, or level, with a CF.

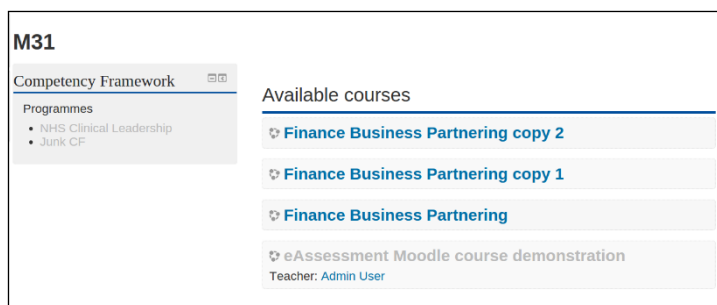
This implies that there will be a need to be able to track Competencies in, and across, courses. This is where the use of a LP is appropriate, though as a mechanism for ensuring that all of the competencies within a CF are accounted for and mapped to content and assessment within at least one course.

Using a CF for pre-assessment

When a CF is used within an organisation or industry, it is common to ask employees to rate themselves against the competency requirements of their role in that organisation. In a similar manner, it should also be possible, and useful, for students to rate themselves against a CF before study on a course starts, and to see how their overall rating changes over time during the period of actual study.

With this in mind, a small number of custom Moodle Activities have been created to support the methodology. By type, they are:

- **Block:** a very simple block that simply lists the available CFs and allows a student to choose one (or more) to rate themselves against, using the Local Plugin that follows.



- **Local Plugin:** a site-wide plugin that presents a CF with forms inputs for (see figure below):
 - **Experience**
 - **Competency**

Competency Frameworks

Dashboard ► »Courses

'NHS Clinical Leadership' Competency Framework: Self-rating Form

- Get Reports:
 - [Full Competency Framework Profile Report](#)
 - [Full Competency Framework Self-assessment Report](#)

Specialism	S1-Demonstrating Personal Qualities	
Skill	S1-SK1-Developing self awareness	Experience: 0 - 12 months ▼
Competencies		Not Just Comp High
	S1-SK1-C1-Values and principles	● ○ ○ ○ ○
	S1-SK1-C2-Strengths and limitations	○ ○ ○ ● ○
	S1-SK1-C3-Emotions and prejudices	● ○ ○ ○ ○
	S1-SK1-C4-Feedback	○ ○ ○ ○ ●
Skill	S1-SK2-Managing yourself	Experience: 12 - 24 months ▼
Competencies		Not Just Comp High
	S1-SK2-C1-Manage emotions	○ ○ ○ ● ○
	S1-SK2-C2-Meeting responsibilities	○ ○ ● ○ ○
	S1-SK2-C3-Flexible plans	○ ○ ● ○ ○
	S1-SK2-C4-Plan workload	○ ○ ○ ○ ●
Skill	S1-SK3-Continuing personal development	Experience: >24 months ▼
Competencies		Not Just Comp High
	S1-SK3-C1-Seek opportunities	○ ○ ● ○ ○

- **Module:** an extension (currently) to the Learning Objective Profiler (LOP) module, to include a tab to monitor the progress of Competencies that relate to a particular course.

This is a set of two pages:

- The first is the Self-Rating Form that captures a student's pre-assessment set of ratings.

This screen includes pointers to a Report Generator that produces PDF summaries of the profile.

Competency Frameworks

Dashboard ► » Courses

'NHS Clinical Leadership' Competency Framework: Self-rating Form

- Get Reports:
 - [Full Competency Framework Profile Report](#)
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Switch to Mappings Page

Specialism	S1-Demonstrating Personal Qualities	
Skill	S1-SK1-Developing self awareness	Experience: 0 - 12 months ▼
Competencies		Not Just Comp High
	S1-SK1-C1-Values and principles	<input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
	S1-SK1-C2-Strengths and limitations	<input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
	S1-SK1-C3-Emotions and prejudices	<input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
	S1-SK1-C4-Feedback	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
Skill	S1-SK2-Managing yourself	Experience: 12 - 24 months ▼
Competencies		Not Just Comp High
	S1-SK2-C1-Manage emotions	<input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
	S1-SK2-C2-Meeting responsibilities	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>
	S1-SK2-C3-Flexible plans	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>
	S1-SK2-C4-Plan workload	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
Skill	S1-SK3-Continuing personal development	Experience: >24 months ▼
Competencies		Not Just Comp High
	S1-SK3-C1-Seek opportunities	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>
	S1-SK3-C2-Acknowledge mistakes	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>
	S1-SK3-C3-Continuing professional development	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>
	S1-SK3-C4-Change behaviour	<input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>
Skill	S1-SK4-Acting with integrity	Experience: 0 - 12 months ▼
Competencies		Not Just Comp High

Figure: Screen 1 of the Local Plugin

- The second is for the course/programme designer to use to manage the mapping of individual competencies (or higher level skills and specialisms) to one or more CF.

The immediate use of this is to ensure that a LP contains the required set of competencies – generally all of them. It can also be readily used to tailor a set of LPs, e.g. for a CF that is specified at different levels but which has competencies that are shared across these CF levels (as captured in the LPs).

Competency Frameworks

Dashboard ► Courses

'NHS Clinical Leadership' Competency Framework: Learning Plan mapping
Switch to Ratings Page

		Add/Remove	Learning Plan 1	Learning Plan 2	Learning Plan 3
		All: ⊕ / ⊖			
Specialism	S1-Demonstrating Personal Qualities	⊕ / ⊖			
Skill	S1-SK1-Developing self awareness	⊕ / ⊖			
Competencies					
	S1-SK1-C1-Values and principles	⊕ / ⊖	★	☆	☆
	S1-SK1-C2-Strengths and limitations	⊕ / ⊖	★	☆	☆
	S1-SK1-C3-Emotions and prejudices	⊕ / ⊖	★	☆	☆
	S1-SK1-C4-Feedback	⊕ / ⊖	☆	★	☆
Skill	S1-SK2-Managing yourself	⊕ / ⊖			
Competencies					
	S1-SK2-C1-Manage emotions	⊕ / ⊖	☆	☆	☆
	S1-SK2-C2-Meeting responsibilities	⊕ / ⊖	☆	☆	☆
	S1-SK2-C3-Flexible plans	⊕ / ⊖	☆	☆	☆
	S1-SK2-C4-Plan workload	⊕ / ⊖	☆	☆	☆
Skill	S1-SK3-Continuing personal development	⊕ / ⊖			
Competencies					
	S1-SK3-C1-Seek opportunities	⊕ / ⊖	☆	☆	☆
	S1-SK3-C2-Acknowledge mistakes	⊕ / ⊖	☆	☆	☆
	S1-SK3-C3-Continuing professional development	⊕ / ⊖	☆	☆	☆
	S1-SK3-C4-Change behaviour	⊕ / ⊖	☆	☆	☆
Skill	S1-SK4-Acting with integrity	⊕ / ⊖			
Competencies					
	S1-SK4-C1-Uphold ethics	⊕ / ⊖	☆	☆	☆
	S1-SK4-C2-Communicate effectively	⊕ / ⊖	☆	☆	☆
	S1-SK4-C3-Promote equality	⊕ / ⊖	☆	☆	☆
	S1-SK4-C4-Compromised ethics	⊕ / ⊖	☆	☆	☆
Specialism	S2-Working with Others	⊕ / ⊖			
Skill	S2-SK1-Developing networks	⊕ / ⊖			
Competencies					

Figure: Screen 2 of the Local Plugin

Defining a Competency Framework

Some of the Moodle functionality supporting CFs is good, and quite generic in a way. In looking at a number of CFs, it is fairly standard practice to define three levels of hierarchy (see Section 2).

I have followed the Microsoft convention for the names of these three levels, though the labels for these levels are fully definable:

1. Specialisms
2. Skills
3. Competencies

A CF can be built directly via the Moodle CF interface, however for a framework of any real size this is a very time-consuming activity. It is quicker to build a CSV file (e.g. via an Excel spreadsheet) with the necessary information.

Moodle 3.2 onwards has an 'import' feature that makes it easier to develop a complex CF outside of Moodle, and to import it into one or more Moodle instance.

By making use of existing Moodle CF framework, the implication is that this methodology makes use of standard Moodle CF tables, including:

- mdl_competency_framework
- mdl_competency

- mdl_competency_usercomp (which holds any ratings that a user collects)

The local plugin and the CF module (currently implemented as a tab within the Learning Objective Profile module) make use of these tables.

Note: If CFs are to be defined and used, then the course materials should enable the learner to become 'competent' in the Competencies within a CF that relate to the course they are studying.

For completeness, a set of courses (e.g. for an MBA) should cover all the Competencies of a CF.

Using Competencies in Moodle – and the implications

Moodle uses Competencies in two areas:

- to build **Learning Plans** (LP)
- to be tracked via **Activities**.

Looking at the latter use, Competencies can be linked to Moodle Activities – though the only really meaningful ones are Quizzes and, to a lesser extent, Assignments.

Note: The important implication of this is that, not only does the content of a course have to relate to a subset of Competencies in a CF, but that the Activities that are used to track a student's proficiency in these Competencies must somehow measure exactly that.

That is, they have to test whether or not a student has achieved 'competence'.

Course competencies

You are proficient in 0 out of 4 competencies in this course.

0.0 %

S1-SK1-C1-Values and principles *nhs-cf-s1-sk1-c1*

Recognise and articulate their own values and principles, understanding how these may differ from those of other individuals and groups

Path: NHS Clinical Leadership / nhs-cf-s1 / nhs-cf-s1-sk1

Not competent

Commonly Used Moodle Question Types

S1-SK1-C2-Strengths and limitations *nhs-cf-s1-sk1-c2*

Identify their own strengths and limitations, the impact of their behaviour on others, and the effect of stress on their own behaviour

Path: NHS Clinical Leadership / nhs-cf-s1 / nhs-cf-s1-sk1

Audio-based Options

S2-SK4-C4-Willing to lead *nhs-cf-s2-sk4-c4*

Are willing to lead a team, involving the right people at the right time

Path: NHS Clinical Leadership / nhs-cf-s2 / nhs-cf-s2-sk4

Graphical and Drag and Drop Features

S1-SK3-C1-Seek opportunities *nhs-cf-s1-sk3-c1*

Actively seek opportunities and challenges for personal learning and development

These two notes have implications for Authors writing learning materials for a course that fits within a programme that relates to a particular Competency Framework.

Using the LP

One obvious question to ask is *“how do we ensure that every Competence with a CF has actually been included in at least one of the courses?”*

This is where the notion of a Learning Plan (LP) is useful, though not in the strict Moodle sense of its use.

- The LP includes Competencies
- Each Competency in a LP should be linked to a course
- Activities within a course can link to Competencies (with various settings).

The LP should therefore be created to include every Competence within a CF, as this then offers a simple and ready mechanism to track that each Competence has been linked to at least one course. It is also to be expected that any single Competence may relate to one or more courses.

This figure shows how Competencies (for debug purposes this real Competency names from the NHS example CF, but prefixed these names with tags such as *S1-SK1-C1* to allow ready tracking of which level entry in the CF is being referenced. These will be tidied up once things are stable).

Learning Plan 1 ^{*}

Learning Plan 1

[Add competencies to learning plan template](#)

Learning plan template competencies

2 out of 2 competencies linked to courses 100.0 %

✦ **S1-SK1-C1-Values and principles** nhs-cf-s1-sk1-c1 ✕

NHS Clinical Leadership - Competency

Recognise and articulate their own values and principles, understanding how these may differ from those of other individuals and groups

Path: [NHS Clinical Leadership](#) / [nhs-cf-s1](#) / [nhs-cf-s1-sk1](#)

Linked courses: [eAssessment Moodle course demonstration \(Demo3\)](#)

✦ **S1-SK1-C2-Strengths and limitations** nhs-cf-s1-sk1-c2 ✕

NHS Clinical Leadership - Competency

Identify their own strengths and limitations, the impact of their behaviour on others, and the effect of stress on their own behaviour

Path: [NHS Clinical Leadership](#) / [nhs-cf-s1](#) / [nhs-cf-s1-sk1](#)

Linked courses: [eAssessment Moodle course demonstration \(Demo3\)](#)

Then, within each course it is relatively easy to track, again via the LP, that each relevant Competence is linked to an Activity (though the primary use will almost certainly be that for Quizzes).

With the potential that programmes will have to be able to relate to, and cover, the Competencies within a CF, there are (obvious) implications for course Authors:

- Content in any course must cover all the detail required for a student to achieve proficiency in a set of Competencies – a subset of the overall CF set of Competencies
- Activities (Quizzes) much be written to relate to, and measure, proficiency in these Competencies

Metadata Requirements

The use of Learning Objectives (LO), and the LO linking information that maps individual questions and course content chunks to LOs, can enhance the use of CFs.

This additional metadata is a relatively minor authoring overhead, and it has the obvious advantage of ensuring the relevance of all content within a course. Its use can be extended to work for CFs, and no other additional information beyond this simple overhead is foreseen at this stage.

The Learning Objective (LO) details can be used to determine:

- which Activities are linked to a particular Competence
- which LOs can be linked to a particular Competence (as the LO links are inherent in the quiz Activities)
- which content sections should be studied to become proficient in a Competence.

This is an extremely powerful use of the underlying information readily available in the master (XML) source materials.

Of course, Authors will have to be aware of the details of a particular CF and be prepared to identify which Competencies will form part of their course - to be covered by their content.

This is a responsibility that might be passed 'upwards' to a programme co-ordinator, as the design of a programme curriculum and the syllabi of the constituent courses has to be done with knowledge of the overall requirements of the CF. It is this programme co-ordinator that will also be the owner of the Learning Plan (LP), and who will take the responsibility for ensuring that individual course content fulfils the overall requirements of the CF/LP.

Moodle implementation

In implementing a CF/LP framework in Moodle one or two specific details have been introduced within an overall implementation that is still quite generic. The Moodle implementation can be regarded as a reference for any alternative implementation.


These details include the following.

- Default Moodle 'scales' for rating competencies are too simple, so two custom scales have been introduced that relate to the two lower levels of the CF hierarchy (skills and competencies)
 - cf-competency-scale – used to capture competence levels (currently a four point scale:
 - Not competent
 - Just competent
 - Competent (see the Moodle [default](#) for this scale)
 - Highly competent
 - cf-skill-scale – used to capture the student's experience level (currently a three point scale)
 - 0 – 12 months
 - 12 – 24 months
 - >24 months

While Activities, such as quizzes, can automatically set a competence level, they can only set the default ('Competent') on completion of the Activity. This is a poor feature as it does not allow the setting of a particular level or give finer control, e.g. passing a quiz.

eAssessment Moodle course demonstration

[Dashboard](#) ▶
 [»Demo3](#) ▶
 [»Reports](#) ▶
 [»Competency breakdown](#)



Student2 CAPDM

Message

Competency breakdown

Competency ratings in this course are updated immediately in learning plans.

Competency	Rating
S1-SK1-C1-Values and principles <i>nhs-cf-s1-sk1-c1</i>	Not competent
S1-SK1-C2-Strengths and limitations <i>nhs-cf-s1-sk1-c2</i>	Not rated
S2-SK4-C4-Willing to lead <i>nhs-cf-s2-sk4-c4</i>	Not rated
S1-SK3-C1-Seek opportunities <i>nhs-cf-s1-sk3-c1</i>	Not rated

Fortunately Learning Plans come to the rescue, as a standard feature – see [Teacher Rating](#) (see figure above) – allows a finer level of competence to be achieved. This neatly ties up the student's self-rating via the Block and Local Plugin (which use a four point competence scale), with the teacher ratings achieved on completion of an Activity (quiz).

This allows a student to compare their own self-rating (which really should be done prior to starting study) with the ratings actually achieved for each course at the end of study.

Note: A self-rating covers all Competencies within a CF, whereas a course rating report only includes those Competencies linked to that course.

Reporting is complex, and to be meaningful the methodology currently uses a specific algorithm to offer feedback measures that have a useful interpretation. These measures are summarised via SQL queries, which provide the data for the current custom reports. If the reporting requirements change, or if it need to be augmented or re-designed, then this does not affect the Moodle implementation - it only affects:

- the data querying – implemented as a small set of stored procedures in MySQL
- the reporting – which currently uses the JasperServer reporting engine. This is an XML-based system, flexible, and both open source and commercial. It comes with a suite of tools, including Studio which makes report design ‘easy’! There is no absolute reliance on JasperServer, and the Moodle modules can link to any other capable server.

The current ‘Points Algorithm’

Again, borrowing from the Microsoft CF ‘engineering’ domain, it is possible to devise some meaningful way of rating and tracking proficiency against the Competencies.

The local plugin and the CF module (currently implemented as a tab within the Learning Objective Profile module) make use of these tables.

Note: This algorithm is not a prescription, merely an illustration of how a competency rating might be interpreted. You are free to invent and implement your own.

For completeness, a set of courses (e.g. for an MBA) should cover all the Competencies of a CF.

At some point – ideally before starting out on a course or programme – a user should be introduced to the CF and use it to rate their current position against the lowest level **Competencies** and the mid-level **Skills**. Students could assess themselves against each competence using the following ratings:

- Weak (0 points)
- Fair (1 point)
- Good (2 points)
- Very Good (3 points)

Though, given that Moodle supports custom scales it is proposed that we give some more meaningful terms to these points – Not competent, Competent, Just Competent, Highly competent.

These terms can be defined as follows:

- Not competent – *“I have little or no exposure to this topic area”*
- Competent – *“I have some exposure to this topic but need further understanding and support”*

- Just competent – *“I have good understanding of this topic area and only need occasional advanced level support”*
- Highly competent – *“I have a very good understanding of this topic area and may provide support to others”*

At each Skill level, students will record their experience in the Skill in the ranges:

- 0 – 12 months
- 12 – 24 months
- >24 months

Undergraduate students will generally have no experience, having never been in employment, but for MBA students then this scale will have more meaning.

This self-rating exercise allows a mixture of:

- Competency Points
- Ability Points
- Expertise Points

to be generated for each of the Specialisms and Skills CF. These point scores can then be reported for comparison with the initial self-rating and as the student progresses through the courses.

Principles

The rationale for the rating includes:

- Individual experience (No. of months) is specified at the Skill Level.
- Users assess competence at a rating of 0-3 against the lower level Competence definitions.
- Competence, Ability and Expertise Points are accumulated at the Skill Level
 - Competence Points give an overall view of capability in the Skill
 - Ability Points are indicative of the spread of capability across the competences defining the skill
 - Expertise Points reflect capability and experience.

To calculate the Competence, Ability and Expertise Points:

- Competence Points
 - Sum the ratings against each competence

- Multiply the result by the skill weighting to give the competency points
- Ability points
 - Score 3 points for every competence rated at '3'
 - Score 2 points for every competence rated at '2'
 - Deduct 1 point for every competence rated at '1' or '0'
 - Minimum score is '0'
 Multiply the result by the skill weighting to give the ability points
- Expertise Points
 - Score 3 points for every competence rated at '2' or '3' and experience in the range >24 months
 - Score 2 points for every competence rated at '2' or '3' and experience in the range 12-24 months
 - Score 1 points for every competence rated at '2' or '3' and experience in the range 0-12 months
 Result of above is expertise points

There is a method to this madness. While this reporting is not designed to give 'all the answers' Its purpose is to give indicators as to where skills' improvements may be required and pointers for further investigation.

There are four key interpretations behind this:

- A Total Assessed score of $\geq 50\%$ of the Possible score suggests a fair to good level of competence.
- A Competence score $\geq 50\%$ of the Possible score suggests a fair to good level of competence. What is perhaps unclear from the Competence points alone is whether the Competency rating is, say, 3, 3, 0 or perhaps a rating of 2, 2, 2.

This is where the Ability points provide an indicator. In this case, the Ability points = Competence points, indicating a fair or good level of competence.

- If the Ability points = Competence points, this indicates that the ratings for each of the competencies are at the fair or good level, otherwise the ratings for at least one of the competencies are at the no experience or weak level, and requires further investigation.

Expertise points are gained when a Competency is rated at '2' or '3'. An Expertise points score of 6 against a possible 9 suggests at least > 12 months experience in the highly rated competencies.

- If the Expertise points $> 50\%$ of Possible Expertise points, then Experience is at least > 12 months in the fair or good rated competencies. If the Expertise points

< 50% of Possible Expertise points, then the Experience is < 12 months in the fair or good rated competencies, or that there is a high level of experience, but only a few of the competencies have been fair or good rated. This situation requires further investigation.

I repeat that nothing is set in stone and interpretations, via some algorithm, can be readily changed. This algorithm has been taken from an example CF that has been used in industry for some time now.

A Reference Implementation

A reference Moodle site can be found at the following address:

- <http://demo.capdm.co.uk>

There will be at least three ready constructed Competency Frameworks:

- The *NHS Clinical Leadership* CF
- The *CGMA 'Business'* CF
- The Erasmus+ *Flip-It Flipped Learning* CF (which is based on the European e-Competency Framework)

At present there are no courses or content specifically designed to relate to these CFs. However, there are example courses which are perhaps slightly contrived, but otherwise fully functional.
