Developing objective measures of quality in actuarial education – the benchmarking project

Introduction

This paper reports on the project established by the Society of Actuaries in the US [SOA] and The Actuarial Profession in the UK [TAP] to benchmark their qualification processes. There were two main reasons for establishing the project in spring 2008;

- To develop objective measures of quality to help to demonstrate that the qualification processes ensure fitness for purpose of newly qualifying actuaries.
- To explore ways of offering more value for money for members through learning from each other and adopting improved processes.

The paper will examine the progress to date and plans for the future. It examines some of the difficulties encountered and how they have been overcome and looks at the lessons learned along the way. Since the project' inception consideration has been given to extending its scope to include other actuarial associations to provide comparable metrics on a wide scale.

Background

The establishment of the Professional Oversight Board in the UK as a consequence of the Morris Report into the actuarial profession, published in 2005, led to a detailed examination of the qualification process for actuaries operated by TAP. A number of significant changes were made to the qualification process as a result of Morris, in particular an accreditation system for universities to gain some exemptions from TAP's examinations. One of the questions posed by POB related to exploring how the Profession knew the qualification process produced the right outcomes. The examination processes used by TAP are comprehensive and complex with many checks and balances; the key question posed by POB was, how do we know that these processes work effectively. They suggested benchmarking the qualification process against other, similar professional bodies, to provide insights into the provision of objective measures of quality to prove that current processes were fit for purpose.

Initial discussions were held with other professional bodies in the UK such as accountancy and law. It soon became clear that there were more differences than similarities in the ways in which each of these bodies produced qualified professionals, making comparisons of little perceived value. Instead, contact was made with overseas actuarial bodies in the US and Australia because it was felt that comparison would be easier and results more meaningful. SoA, the Casualty Actuarial Society [CAS] and the Institute of Actuaries in Australia [IAAust] expressed initial interest and this led to an exploratory meeting held at the SOA in late spring 2008. This led to the initiation of the project.

Project Development

At the same time that the UK Profession was discussing objective measures of quality in their examination processes, the SOA were beginning to examine their examination processes from the perspective of enhanced member services, improved process efficiencies and value for money. One part of this review, which was discussed between the bodies, was about trying to reduce the time lag between examination and the release of results. Information was exchanged, which led to a more detailed comparison of processes. Thus, when it was agreed that the benchmarking study would be taken forward, there was already some experience of information exchange and comparison.

After the initial meeting in Chicago in May 2008, documentation on the examination processes was exchanged in confidence. There is a vast amount of relevant data and it took time for each body to examine the processes of the other body. This delay was exacerbated by the need for each body to maintain business as usual in what are always very busy examination periods.

One of the first impressions to be gained from this exchange of information was that; given that both bodies were doing essentially the same thing with their exam processes, it was amazing how different the processes are. It was easier to identify the differences than the similarities and there was a detailed discussion about why these differences had occurred. A number of the differences threatened to make the comparison more difficult. For example, in the UK students have to join the professional body before they can take any examinations whereas with the Society, anyone can take the examinations but can only join once they reach Associate level. One of the obvious metrics to use in the benchmarking process is travel time to qualification because this is one way potential trainee actuaries compare alternative career routes. The difference in membership rules makes both the start time and the finish time of this metric difficult to compare. Detailed discussion was required to reach a sensible comparison basis for this metric.

Table 1 gives examples of similarities and differences in the two sets of processes. It is perhaps worth discussing a few of the significant differences;

- TAP uses 'Guinea Pigs' [newly qualified volunteers] to review each paper before use. This process is a check that the questions can be completed in the time available and that they are within the syllabus. When this process works well, it reduces the likelihood of student complaints about the fairness of the assessment.
- TAP also offers exam counselling by the 5 staff actuaries after each exam diet to review the candidate's performance and to offer advice on how to improve at the next sitting. The impact should be to improve the pass rate legitimately.
- SOA does not pay their volunteer examiners whereas TAP do pay but not at commercial rates. The SOA holds meetings of Examiners to determine results in attractive locations which are a benefit in kind for the volunteers.
- SOA does not hold meetings of Examination Boards while TAP does. The purpose of the meeting for TAP is for each Principal Examiner to present a report to the Board on the exam diet and for them to propose a pass mark and hence a pass rate for Board approval. The Board also considers a common approach to any claims for mitigating circumstances which candidates claim.
- SOA uses on line provision of materials [but not tutorial support] to candidates and the early examinations are now all offered as computer-based multiple choice questions. TAP does not provide tuition material to candidates and does not offer on-line examinations apart from in two course based subjects.
- Examinations in the SoA process are set by large subject committees while in TAP; a small appointed team [3 to 7 strong depending on the subject] are responsible for each examination.

There are a number of other differences between the two sets of processes which combine to make comparison difficult on common set of metrics.

The next stage in the project was to agree to a framework for the comparison. As the SoA was already using a balanced scorecard approach across the organisation, it was decided to apply this framework to the benchmarking project so that easier linkages would be possible. Thus, the approach took on a number of stages:

- Identifying stakeholders with a legitimate interest in the qualification process. The ones identified were:

    - The candidates themselves who want a fair, reliable, valid and relevant process.
    - Qualified members who want newly qualifying members to be up to date and competent in current practice.
    - Employers who want newly qualifying actuaries to be fit for purpose and practice with a relevant set of competences from a qualification process that guarantees standards are maintained.
    - The public who want qualifying actuaries to be knowledgeable, trustworthy and performing to professional standards while acting in the public interest.

- The second stage was to identify a number of strategic themes that the qualification process should provide. The list is shown in Table 2. To examine further a few examples from the list:

    - The theme of reducing travel time while maintaining standards might seem unachievable but nevertheless is part of the pressure felt in both organisations. The qualification time could be seen as a guarantee of standards being maintained or as a barrier to entry to maintain salaries of existing qualified actuaries. However knowing that the average travel time is high might put off highly desirable graduates who could move into competitor careers such as investment banking or management consultancy which do not have a professional qualification process.
    - An error free examination system is as obviously desirable as it is impossible to guarantee. There are so many variables involved in running the system, with many risks outside the control of the professional body, that it is impossible to guarantee an error free system. Nevertheless it is clearly an appropriate strategic theme to strive to obtain such a system.
    - Recruiting the right people in and qualifying the right people is axiomatic and appropriate as a strategic theme but difficult to prove in practice. Recruitment is carried out by firms employing actuaries and not by the professional bodies who have a careers function of attracting talented graduates into the actuarial profession rather than a competitor profession. Pressure from employers in relation to the careers function relates to 'share of talent' basically, the professional bodies have to work with the recruits the employers take on. However, the professional bodies have much more control over who qualifies through the assessment processes.
    - Broadening the employer base is a more recent theme, perhaps developing because of changes in pensions schemes which over time are likely to reduce the need for actuarial input. The traditional employers, pension consultancies and insurance companies are being augmented by other types of employers who need actuaries in newer fields such as health care, finance, investments and risk management. The main influence that the qualification process can have in this area is in terms of

syllabus coverage which is seen as being up to date and appropriate for these newer types of employers. It was seen as important therefore to have a metric relating to syllabus relevance.

- The third stage relates to the ability to deliver the strategic themes. The main resource is people, both volunteer members and employed staff. Here the emphasis is on;
    - Attracting, developing and retaining talented and committed human resources, both as staff members and volunteers. In the UK system for example, around 100 volunteer members re involved in setting examinations, a further 200 in marking [grading] exam scripts and around 20 members of staff work on delivering the service. In addition, exam invigilators, couriers and others play a key role in service delivery.
    - Getting commitment to the desired outcomes and rewarding effective execution. TAP and SOA use very different volunteer reward systems but it appears that the overall costs are not dissimilar.
    - Identifying and developing leaders at all levels.
    - Promoting a culture of commitment, innovation, service and excellence to ensure that errors are minimised and that service quality is high.

- The final stage is cover financial imperatives;
    - The process needs to generate margins in order to fund strategic initiatives.
    - The process needs to provide cost efficient support and services. Members need to be able to rely on value for money being generated within the qualification processes.

Identifying a Dashboard of Metrics

The next stage in the process was to take each of the strategic themes and to examine the type of metric that could be used to measure each theme. Firstly it was necessary to look at the source of each set of data. The main sources were seen as;

- Registry records which would cover detailed data on examinations and other assessments in the qualification process along with financial data.
- Stakeholder surveys, particularly covering employers and candidates on a regular basis.

The initial consideration gave rise to Table 3 which is shown below which tries to relate sources of data to each strategic theme. A number of these points are worth specific comment;

- Candidates could be expected to comment on their experiences in the examination processes on efficiency, effectiveness, value for money and fairness [preferably before results are issued!!].
- Employers could be expected to comment on whether from their perspective, the right people were qualifying, fitness for purpose and travel time.
- Other themes are more difficult to evaluate and topics such as ‘rigorous’ ‘leading edge’ and ‘prestigious’ needed more thought.

Next Steps

The progress reported above occurred before and during a two day education Conference in Oxford in November 2008 immediately following the IAA meetings in Cyprus and was attended by senior figures in the SOA and TAP. Over the next few months, further exchanges of data took place between the Registrars to keep the process moving forward and a meeting was held in London in June, immediately after the IAA meeting in Tallinn to review progress.

At this meeting a report was presented by TAP on their pilot survey of employers and students after the April as a way of testing these sources of information. There were also comparisons of the use of student feedback questionnaires already in use by both bodies to get participant feedback on courses such as professionalism courses.

Also at this meeting, a draft list of metrics was agreed based on suggestions from various parties involved. Table 4 shows the 'shortlist' of metrics considered. These were seen as the key metrics to track and much of the meeting was involved in technical discussion on to evaluate how available data could be used to populate each category.

The outcome of the meeting was an agreement on a schedule of work for each body to derive further data culminating in a planned meeting at the SOA offices in Chicago in August 2009 to finalise the metrics to be used and to populate each metric with appropriate data.

The Chicago meeting

The meeting in Chicago was highly successful and the planned group of metrics was agreed. These are shown in Table 5 below. This final list may look deceptively simple but each metric was agreed along with the agreed way of measuring each and the frequency of measurement after detailed discussion about available data and about ensuring we are comparing like with like, given the differences noted above between processes in the two organisations. Some metrics relate mainly to the efficiency and effectiveness of the processes and some relate to fitness for purpose of the processes. Examples include;

- Travel time. [Item 10] Because of the differences between the organisations, both the start time and the finish time presented difficulties if equivalence was to be ensured. The start time was defined as the first time candidates pay money to the organisation; entering as a student member for TAP and time of registering for the first exam for SOA. The end point was defined as passing the last exam for SOA and transfer to fellowship for TAP. These were agreed after much debate mainly due to providing a consistent comparison and being relatively easy to measure over time using existing data.
- Syllabus measure of currency and relevance. [Item 9] The SOA had set up a parallel exercise to ensure fitness for purpose of their qualification process which includes a measure on a 5 point scale based on a weighed average of the responses from various stakeholder groups. TAP were happy to accept this metric as the basis for comparison and will collect the relevant data over the next year.
- Current status of joiners [Item11] this is a metric developed by TAP which for entrants in a given year, lists their current status. Thus, by agreeing a set period, say 10 years, it is possible to compare the proportion of those starting who complete within that time period. However because 'starters' are more easily defined in TAP [by time of first payment] n

equivalent time point needed to be fixed for the SOA students where many candidates try one exam and then never appear again. To get a realistic start point, the date of passing the MLC exam was used as the best equivalent point.

- The more qualitative items [items 13 – 16] have each been divided into three categories and clearly there needs to be common agreement of which specific events fit into which category. While a number of actual cases were worked on in the meeting with common understanding easily attained, it was agreed that for at least the first year each case would be reviewed jointly.

Next Steps

Subsequent to this meeting an agreement was made to resolve the outstanding data issues by mid-October 2009 which is after the time of writing. By that time there would be a common start point with a clear understanding of what data needs to be collected, collated and compared and the frequency of doing so.

The Joint education Task Force meeting at the November 2009 IAA meeting in Hyderabad is due to receive a progress report with the opportunity of a few other associations joining in the benchmarking project using the agreed set of metrics. This move would enable a wider set of comparisons to be made but will not doubt introduce a whole new set of measurement issues. It remains to be seen if these can be overcome.

Discussion

So far this paper has described chronologically, the steps taken to get to the current position. It is perhaps too early to evaluate the level of success of the project but some early pointers are offered here;

- An early benefit has been for each body to learn from the other and to review processes previously taken for granted. Examples include the SOA has implemented the use of guinea pigs to pre-test examinations as TAP does and they are also to consider holding Examination Boards as TAP does. TAP is considering the increased use of scanning of some examination scripts as the SOA does and also is reviewing how to shorten the period between examinations and results publication.
- Strong working relationships have been developed at Registry level which have been built on personal contact. While there has been much email communication over time, having met the recipient adds an extra dimension to the relationship.
- There has been an element of the ‘problem shared is a problem halved’ mentality which developed through having to deal with very similar issues involving students and volunteers. It lifts the spirits to know that others face similar, often intractable problems.
- Each body has developed a better understanding of efficiency and effectiveness drivers in their own organisation which should lead to enhanced performance to stakeholders through the balanced scorecard approach. Staff have a better understanding of stakeholder relations and how to enhance them.
- Collecting direct feedback on processes from employer’s students and other stakeholders identifies more ways for improving processes and builds better understanding of needs.

- There is a clearer understanding of objective measures of quality and of what drives fitness for purpose of newly qualifying actuaries and how the qualification processes can be used to improve fitness for purpose and to respond to differing needs as circumstances change.
- The measures developed will, over time provide detailed insights into how to improve processes both in terms of fitness for purpose and cost effectiveness and in terms of service quality to members.

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October 2009

TABLE 1 : Comparison of SoA and TAP Exam Processes

Similarities

- Competencies [Skill sets]
- No tutorials offered
- Test batches
- Issues with reliability of management information from databases

SoA do but TAP doesn't…

- Scanning scripts at Fellowship level
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- Delivery of learning materials
- Non-payment of volunteer examiners and graders
- More use of CBT via Prometric
- More use of MCQ based exams
- E learning infrastructure developed to deliver learning materials and exams
- Serial numbering of exam papers to enhance controls
- More detailed statistics for exam committees [correlations, ratios]
- Graders mark individual questions rather than whole scripts
- No exam boards held
- 1 diet per year of Fellowship exams
- Large exam committees

TAP do but SoA don't…

- Use guinea pigs
- Second mark all scripts
- Offer exam counselling
- Offer exemptions
- Accredit universities
- Use staff actuaries in exam process
- Publish core reading for each subject and update each year
- Markers mark the whole paper
- Exam Boards to agree pass lists, pass marks and pass rates
- Training of new examiners and markers
- Run 2 complete diets of exams per year
- Exams set by small teams of 3 -7 examiners per subject
- Pay examiners and have bonus system for meeting deadlines

TABLE 2 : Strategic Themes

- Transfer knowledge
- Offer a prestigious credential and maintain its value through leading-edge and relevant educational systems and programmes
- Leverage a variety of delivery channels to disseminate and facilitate knowledge transfer
- Rigorous
- Broad based education programmes
- Efficient and effective
- Reduce travel time while retaining standards
- Error free exam system
- Passing the right people
- Benchmark standards internationally with other like organisations
- Promote confidence in the rigour of the system
- Recruit right people in
- to the Profession as candidates
- Broaden employer base

TABLE 3 : Initial views of data sources

Prestigious credential and maintain value
- Number of students and Fellows
- Employment levels of actuaries
- Average salary levels through – newly qualified
  - starting salaries

Leading edge and relevant
- Stakeholder surveys
- Benchmarking

Leverage channels
- Innovation in delivery channels
- Addressing learner needs
- Stakeholder surveys

Rigorous
- Passing right people
- Employer survey

Broad based education
- Practice area review of syllabus
- Independent review by academics (financial)

Efficient and Effective
- Cost per student

Reduce travel time
- Time to qualify
- Stakeholder survey

Error free exam system
- No of errors x importance

Passing the right people
- Salary
- Employer survey

Benchmarking standards
- Balanced scorecard – annual comparison review meeting
- Compare pass rates

Promote confidence
- Member survey + students

Recruit right people
- Degree class on entry
- Employer feedback

Table 4 : Draft Benchmarking Metrics

- Measure of efficiency: number of volunteers (by stratified role) per exam administered
- Number of candidates/number passing/number sitting/number of drop outs
- Number of exams (by category)
- Number of exam errors (3 categories)
- Compensation/incentives per volunteer
- Participant surveys on quality (exams, e-learning, professionalism courses)
- Syllabus measure – currency/relevancy
- Average travel time from first to last course
- Average time allocation per volunteer
- Average cost per candidate
- Average revenue per candidate
- Cost of the overall pathway (including study notes and textbooks)
- Number of complaints (3 categories)
- Number of disciplinary cases (3 categories)
- Number of Associates and Fellows

Table 5 : Agreed Benchmarking Metrics

1	Number of volunteers per exam (Total number of entrants/registrations divided by total number of volunteers. By exam and in total. Recorded every 6 months – 1 September and 1 March).
2	Number of candidates (writing, passing, drop outs) Recorded every 6 months – 1 September and 1 March).
3	Number of exams by category –Associateship/Fellowship Annually.
4	Cost, revenue, and net contribution per candidate (Average - cost and net contribution as a percentage of revenue) (Overhead is included) Annually.
5	Cost of overall pathway/qualification (Associateship/Fellowship) (Including exams and learning material plus subscriptions and professionalism course(s)) Annually.
6	Number of Associates and Fellows – Every 6 months.
7	Compensation per volunteer (per exam and overall average - number of volunteers) Annually.
8	Participant surveys (by course, post exam sessions – every 6 months, employers (Annually)) Overall satisfaction.
9	Syllabus measure of currency and relevancy – Annually.
10	Average travel time (starting point = 1st registration (exam or membership), ending point = last exam for Fellowship passed/transfer to Fellowship) Every 6 months.
11	Joiners/Entrants present status, starting with Exam MLC passers for SOA/starting with 1st payment to UKAP – Annually.
12	Time allocation per volunteer (Number of volunteers by position times Number of hours worked, total number of volunteer hours) – Annually.
13	Defective Questions (minor, medium, major) – Every 6 months.
14	Number of exam errors (minor, medium, major) – Every 6 months.
15	Number of Complaints (minor, medium, major) – Every 6 months.
16	Number of candidate cheating cases (minor, medium, major) – Every 6 months.