

# Vision 2020 – A world-leading actuarial education programme for Africa

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## ABSTRACT

This paper sets out a vision of a fit-for-purpose education programme for the Actuarial Society of South Africa in 2020. Informed by the Principles of Professionalism promulgated by the International Actuarial Association, the Actuarial Society requires its members to keep their professional promise of delivering a quality service that is competent and ethical. This promise sets a goal for the education system. The normative (ethical) curriculum has already been reviewed, and this paper starts the process of reviewing the technical curriculum in the light of the professional promise. Seven key criteria are suggested. There is emphasis on integrating the technical and normative components over four phases of learning, as well as going beyond the curriculum to look at the delivery of learning and assessment. This paper provides a “straw man” that can be discussed and adapted – with the ideal outcome that the profession in South Africa agrees on a long-term view for actuarial education and implements a system that achieves these criteria.

## KEYWORDS

Education; professionalism; transformation; vision; Africa; risk; core competency; specialisations

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## 1. INTRODUCTION

1.1 If every actuary is a debtor to their profession, as the much repeated Francis Bacon quote suggests, then every actuary should be heavily invested in ensuring that the profession is healthy and thriving for the next generation. It is evident that our investment in the future is through actuarial education, which is the sole tool at our disposal for instilling the knowledge, understanding, attitudes and all the other attributes that we desire in our future professionals.

1.2 Another axiom is the change in the environment in which actuaries operate. Not only is this change a given, but also the ever-increasing pace of the change. Actuarial education in 2013 is very different to 1995, when the author completed his actuarial studies; and it is likely to be considerably different in 2020.

1.3 The purpose of this paper is to consider how South African actuarial education may look in the future, not only in terms of what the syllabus covers, but also how it can be delivered. The reference date of 2020 has been chosen – aside from the attractive, if somewhat clichéd, concept of a 2020 vision, it balances a reasonable time frame in which to achieve the vision, with a date that is not so far off that it may promote inaction.

1.4 This paper sets out a mostly deterministic view of this future, and by the nature of being the views solely of the author, can be seen as a “straw man” for further discussion. In the space available, not all my proposals can be set out in detail and fully motivated, and clearly personal biases will come through. At the same time, this paper attempts to build on previous education papers, and in particular, the work of Mickey Lowther, Wendy McMillan and Cisca Venter on normative education.

1.5 Finally, the author acknowledges that actuarial education is a lifelong process, and that post-qualification learning is at least as important as pre-qualification. At the same time, this paper does focus purely on pre-qualification education with the understanding that the thinking in this paper will link to the work currently taking place around Continuing Professional Development.

## 2. BACKGROUND TO THIS PAPER

2.1 The South African actuarial education system commenced in 2010, as an independent actuarial qualification. In retrospect, much of the development work that took place from 2006 to 2009 in preparation for the qualification was around establishing an administrative infrastructure for existing components of actuarial education that had been established in South Africa gradually since the 1950s. The curriculum structure effectively mirrored the UK system, and there were only divergences in the syllabuses at the F2 (UK Specialist Applications) level.

2.2 The project to establish this administrative infrastructure was by no means trivial, and required extensive work which has largely been successful to the extent that a significant majority of students in South Africa are coming through the South African education system. Although there has been some syllabus development since 2010, the overall structure remains tied to the UK system.

2.3 While it has been appropriate to use the UK structure so far, for practical and educational reasons, one could now argue that it is an appropriate time to break away from the thinking of the UK profession and take a long-term view of an education system that would be appropriate not only for South Africa, but also for Africa. One of the key drivers for writing this paper has been the debate around the choice of F1 subjects, which has ultimately become a debate around the brand of an actuary and what the core education of a South African actuary should consist of. A number of times speakers in these debates raised the point that it would be more fruitful to have a more visionary view of our curriculum, rather than be constrained by the UK structure.

2.4 If we are to be an education provider to parts of Africa, which is a strategic objective of the Actuarial Society, there would be a need to move away from the UK structure where such a movement as this makes sense, and be able to offer examinations for all subjects. Currently the Actuarial Society only offers examinations at the Fellowship (F1 and F2 level), while students who do achieve a sufficiently high standard doing the earlier subjects at universities are required to write the equivalent UK papers, though they do not need to join the UK profession. Being able to offer South African papers in these subjects will allow the Society to run examinations on their own terms, both financially and in terms of the content.

2.5 While the earlier subjects cover concepts in a non-country specific context, one can still argue that the current UK approach may not be optimal for education in Africa, and indeed, in South Africa, where transformation of the profession remains a priority. Reviewing the syllabus content and, possibly more importantly, the teaching approaches for all subjects may allow the education system to better support the transformation agenda, particularly in improving the unsatisfactory pass rates in the current system. This, very clearly, cannot be at the expense of even a small drop in standards, but through improvements in content, delivery and assessment that will be culturally sensitive and relevant to the majority of people in Africa.

2.6 A number of other actuarial associations are doing a high-level review of their education systems, and there is currently an initiative to prompt the IAA to do a much more fundamental review of their syllabus when this is next reviewed in 2014. This provides an opportunity for South Africa to be thought leaders internationally, and also to work with the IAA and other actuarial associations in reviewing and updating the fundamental tenets of our education system.

### 3. FRAMEWORKS FOR PROFESSIONALISM AND EDUCATION

3.1 The Bellis (2000) framework of a profession was used by Lowther, McMillan and Venter (2009) in their paper “Education For Actuarial Quality.” The thinking in this paper has now been used in the updated Professional Conduct Standard for the Actuarial Society as well as the ”Principles Of Professionalism” document published by the IAA Professionalism Committee (Doyle et al., 2011).

3.2 It notes three aspects of a profession being the technical body of knowledge, the normative aspect which relates to the delivery of the knowledge, and the organisational role of the professional body. Lowther, McMillan and Venter (2009) have done extensive work on the normative skills required of an actuary and the current normative skills project of the Actuarial Society is in the process of incorporating and integrating these skills into the curriculum.

3.3 It is worth reminding readers what specific skills are being referred to under this broad description of normative. The Lowther, McMillan and Venter (2009) paper divides these skills into four categories as follows:

- a) **Life skills** This could include time management, planning, research skills, managing diversity amongst many others.
- b) **Interpersonal and communication** Communication skills would include written, presentation skills, debating skills etc.
- c) **Business management** Including business acumen, strategic skills.
- d) **Ethical** Including much of what is covered currently in professionalism courses, including due care, professional conduct, conflict of interests, whistleblowing, disciplinary process etc.

3.4 However, there has been relatively little thinking around the fundamental technical skills required for an actuary within the Actuarial Society– and while to an extent this has been framed by the syllabus inherited by the Actuarial Society, as well as the IAA syllabus, there has been little fundamental thinking around what an actuary should know.

### 4. TRENDS IN ACTUARIAL EDUCATION IN ENGLISH-SPEAKING COUNTRIES

4.1 While there is insufficient space in this paper to review developments in actuarial education internationally in detail, this section sets out some of the author’s thoughts around the main developments over the past thirty years in terms of actuarial education. The focus is on the major English-speaking countries offering actuarial education.

4.2 The first trend has been a reduction in the focus on traditional life insurance mathematics, and a move towards models that have a wider applicability in financial

services. The inclusion of risk theory and run-off triangles and the reduction in content around mortality, especially exposed-to-risk and graduation in the UK syllabus is an example of this.

4.3 Allied to that has been a greater focus on applications such as pricing in a non-specific context, as opposed to covering pricing within a specialist field only. All of the English-speaking education systems now have a broad applications subject around the concept of actuarial risk management or the actuarial control cycle.

4.4 There has been an increased specialisation in one, or two, practice areas, as opposed to all students covering extensive content in a number of practice areas. This is evidenced by the current structure of F1 (ST) and F2 (SA) subjects in the current South African (UK) system, whereas previous systems required specific studies in investments, life insurance, general insurance and pensions.

4.5 Based on the author's personal study experiences, the sense is that the UK system has seen a greater emphasis on understanding principles and communicating them, rather than providing a mass of technical and legislative detail. This is clearly a positive development in ensuring that the actuary has a mastery of higher-order skills as opposed to merely being able to memorise a lot of detail.

4.6 Finally, the crucial increase in the focus on normative (delivery) skills should be noted. The Professionalism Course, Work-Based Skills, Communication paper, Business Awareness Module and Model Documentation, Analysis and Reporting have all been added to the UK system in the past 25 years, and the South African efforts to integrate these skills further should soon bear practical fruit. Even at an IAA level, where agreement is required across more than 60 full members, there is increased acknowledgement of the importance of these skills in terms of the education process.

## 5. KEY CRITERIA FOR SOUTH AFRICAN EDUCATION IN 2020

5.1 The following seven criteria for an effective South African actuarial education system in 2020 are proposed.

- a) Best current international practice to the extent that the system is regarded as world-leading, with full international recognition.
- b) A lifelong learning approach with integration of technical and delivery skills from the start of the process.
- c) Strengthening the core component of the education system to ensure the core competencies of an actuary are instilled.
- d) Ensuring that actuaries are leaders in the fields where specialisations are offered.
- e) A syllabus and system that allows transformation of the profession in South Africa.
- f) Relevance and access to the rest of Africa.
- g) Improved pass rates for students without compromise on standards.

5.2 Many of these criteria should be non-controversial and sensible to all stakeholders. Criterion (a) was an objective of the initial establishment of the South African qualification, while (b) is a key facet of the current normative skills development. (e) and (f) are key strategic objectives of the Actuarial Society, while (g) addresses a shortfall in the current education system.

5.3 While criteria (c) and (d) will hopefully appear sensible to the reader, they require some unpacking before a discussion on what an education system in 2020 might look like. The questions around what the core competencies of an actuary are, and what specialisations may look like, are fundamental and are explored in the next two sections.

## 6. THE CORE COMPETENCY OF AN ACTUARY

6.1 It should be evident that the starting point to answering the question concerning what the student actuary should be taught in 2020 would be an examination of the core competency requirements of an actuary. Identifying core competencies is not at all trivial, as any actuary who has tried to explain their profession to non-actuarial family and friends will be aware.

6.2 There are a few useful starting points. The fairly succinct Wikipedia definition of an actuary, which itself is derived from Trowbridge (1989), states “an actuary is a business professional who deals with the financial impact of risk and uncertainty. Actuaries provide expert assessments of financial security systems, with a focus on their complexity, their mathematics, and their mechanisms.”

6.3 The vision of the Actuarial Society is set out as follows “an actuarial profession of substance and stature, serving, and valued by, our stakeholders as a primary source of authoritative advice and thought leadership in the understanding, modelling and management of financial and other measurable risk.” (ASSA, 2013a)

6.4 The recent paper by the International Actuarial Association Task Force (2013) on the role of the actuary suggests that “[actuaries] have a detailed understanding of economic, financial, demographic and insurance risks and expertise in 1) developing and using statistical and financial models to inform financial decisions and 2) pricing, establishing the amount of liabilities, and setting capital requirements for uncertain future events.” The paper also emphasises the key importance of developing and applying models, as well as noting that actuaries could have a role to play outside traditional financial institutions, including in government.

6.5 The Actuaries Institute in Australia has developed a competency framework which was piloted in 2012. The specific competencies in this model are as follows: Contribution to Business Strategy; Leadership; Actuarial Approach to Problem Solving; Valuing

Uncertain Cash Flow; Risk Management; Professional Governance; Product Development Management and Pricing; Investment Advice and Governance. (Wetherbee, 2012)

6.6 In the Framework For Actuarial Quality, produced by the Financial Reporting Council (2010), who have oversight of the UK actuarial profession, the technical skills of the actuary are described as “a thorough knowledge and understanding of current financial, economic and statistical theory and practice, and the wider business, regulatory and economic environment; proficiency in using and interpreting the latest relevant actuarial and related methods and in exercising judgment; and a dynamic understanding of relevant aspects of their clients’ or employers’ business or operations, including the relevant business model and the related risks.”

6.7 Finally, in reviewing work done on the core technical competency of an actuary, the extensive work done by Allaben et al. (2010), representing the two major professional bodies in the United States should be noted. In their paper, they describe actuarial science as “primarily concerned with the study of consequences of events that involve risk and uncertainty.”

6.8 The authors go on to detail what they view as the fundamental concepts of actuarial science. These concepts are grouped into four major areas, namely the statistical framework, economic and behavioural framework, risk management and modelling, and finally, financial security systems.

6.9 There is some danger in trying to simplify something clearly complicated and multi-faceted, both within the original frameworks, and deriving a core competency from them. However, it remains very useful to give an overall purpose to our core education and what should be covered in the core content.

6.10 The key word that recurs throughout these papers and frameworks is risk. In an attempt to synthesise all of the above into a succinct statement of the core competency, the key technical competency of an actuary could be described as “*the ability to understand risk (predominantly, but not exclusively financial), specifically by being able to develop, apply and communicate models of risk and uncertainty.*”

6.11 Ancillary to this core competency, and aligned to themes in much of the above discussion would be a prerequisite understanding of mathematics, statistics, economics and finance to provide the background to build these models related to risk and uncertainty. In addition, the actuary would need to have a deep understanding of the assets and liabilities of financial security systems, and other institutions, to be able to apply these models in practical situations and have a holistic view of all the risks faced by these institutions.

6.12 The ideas in 6.10 and 6.11 could provide a starting point to review the core technical content in the actuarial curriculum; this would however require a comprehensive project, which should focus just as much on what could be taken out of the curriculum, as well as what could be added. At the recent Education Conference of the Actuarial Society, two specific topics that were suggested as additions to the curriculum were data analytics and economic models of decision-making under uncertainty. Finding topics to remove from the syllabus might be harder, but there are some historical products and techniques which could at least receive reduced coverage.

6.13 If an actuary is educated to be an expert in understanding and modelling risk, this should allow him/her to operate in a wide variety of contexts, including those outside the traditional financial security systems. However, the risk models and concepts clearly need to be taught in a practical context, and therefore it would seem logical that students garner some understanding of the products and operations of life insurers, general insurers, retirement funds, health care systems and arguably also banks. Similarly, a topic like life contingencies would almost certainly remain core, given that any model involving contingent cashflows and long-term liabilities will be very useful, not only in the traditional contexts, but as an illustration of overall principles.

6.14 It is worth repeating that this core technical competency of an actuary can never be isolated from the ability to deliver this competency in practical situations; specifically the normative skills mentioned in 3.3 and alluded to in many of the references above.

## 7. SPECIALISATION

7.1 When the author commenced his actuarial studies, most actuaries in the United Kingdom were practising in Life Insurance and Pensions, with the profession starting to make forays in General Insurance.

7.2 Subsequently, one can note Health and Care as a growing international field of actuarial practice. Many actuaries also practise in investments, although the profession is not necessarily regarded as leading in this area. The 2008 financial crisis, caused at least to some degree by institutions taking on risks that they didn't understand, has potentially created a real opportunity for the actuarial profession. As a result, the international CERA qualification has seen a number of key professional bodies around the world, including the Actuarial Society, try to capitalise on this opportunity by creating the leading worldwide qualification in Enterprise Risk Management.

7.3 Linked to some extent to this opportunity in Enterprise Risk Management is the field of banking, and in this area, the South African actuarial profession is arguably already world-leading. Approximately ten percent of South African actuarial students are working in this area, with an even higher proportion of new graduates entering this field. Work is underway in the Society to set up an F2 subject in this area in the next few years.

7.4 The above paragraphs list seven fields where actuaries are currently specialising; there are pioneering actuaries in many other fields. There is clearly a constraint on creating specialised education material in each field as the profession is a small one, both locally and internationally. The core toolkit of an actuary and their unique problem-solving approach should allow them to move into specialised areas relatively easily.

7.5 However, the author does believe that in the main specialist areas, the core content should be enhanced with in-depth technical and organisational knowledge, including some mathematical techniques that may currently be excluded from the core. This needs to be accompanied by the development of higher-order thinking skills, and normative skills that focus on strategic leadership and practical business sense. This will ensure that the Actuarial Society maintains (or arguably reclaims) thought leadership in the fields in which the Society chooses to offer specialisations.

7.6 The combination of a strengthened core toolkit and focused specialisations would be analogous to the medical profession, where a general practitioner has the full professional toolkit, but the specialist is an expert at applying the tools in a specific context.

## 8. A FOUR-PHASED APPROACH

8.1 To achieve the criteria of an education system set out in Section 5, the author suggests an extension of the four phases of normative skills development as per Lowther, McMillan and Venter (2010) and Gladwin (2011) into an integrated pre-qualification education process, where each stage has appropriate technical content as well as normative development.

8.2 Very broadly, the technical development proposed in the four phases is as follows:

- **Phase 1 – Undergraduate** The focus in this phase is on providing the technical skills to develop and apply models for financial and other risk, including providing the appropriate economic, mathematical, financial and statistical background.
- **Phase 2 – Honours/preliminary work** The focus here is on deepening understanding of the assets and liabilities of financial and other institutions, as well as the application of the skills learned in the first phase to problems relating to these assets and liabilities.
- **Phase 3 – Associateship** The focus in this phase is on understanding the interaction between assets and liabilities in order to model and understand the risks and capital requirements for financial and other institutions. This will allow the associate actuary to apply their actuarial toolkit to a wide range of problems for a diverse range of institutions.
- **Phase 4 – Fellowship** The focus in this phase is gaining in-depth knowledge and understanding of a specialised area, so that the fellow actuary can apply high-order skills in order to play a leadership role in these areas.

8.3 Each phase will also include the normative skills development which would be broadly similar to the current four-phase approach that has already been developed. The following four sections set out each phase in a more detail, including some suggestions on the very critical issue of how the education can practically be delivered.

## 9. PHASE 1: UNDERGRADUATE

9.1 The starting point in this phase is the undergraduate degree and within this is the premise that the actuarial student will commence their actuarial studies at university as opposed to in the workplace or concurrent with a non-actuarial degree. While the vast majority of students in English-speaking Africa do enter the actuarial profession with an actuarial degree, the system would still need to cater for students who enter via other routes.

9.2 The technical content of this phase should be focused on providing the basic actuarial toolkit as well as the supporting economic context in which actuaries operate. Appendix B suggests ten themes into which the material in this phase can be grouped. Five of these themes are supporting subjects, which correspond broadly to current Part A1 subjects, while the remaining are specifically actuarial, and also include some of the key normative competencies required for this phase. This includes an appreciation of the nature of being in a profession, practical modelling skills, as well as commencing the development of the important communication competence.

9.3 While these ten themes could provide a framework for universities providing these courses, it is suggested that a somewhat more flexible approach to accreditation is adopted, consistent with recent thinking in the UK profession. While the professional body should retain ownership of the syllabuses, it may be appropriate to allow slightly lower coverage of the syllabus than the currently required 95% to achieve accreditation. In addition, degree accreditation should be considered, in which a student who has achieved a consistent overall standard, and meets certain subminimum, could be considered for exemption from this entire section of curriculum, as opposed to a subject-by-subject exemption. The intention of this would be to increase academic autonomy as well as reduce the time to qualify. However, a rigorous accreditation process would ensure that standards are not compromised.

9.4 There will still be a number of students who will not achieve the required standard at an accredited university, study at a non-accredited university (especially in the rest of Africa) or enter the profession without an actuarial degree. There may be three options for these students to complete this phase – on the premise that the Actuarial Society does not have resources to teach and examine these subjects itself

- a) The student could write an equivalent exam through another actuarial professional body. This is the current option, via the UK, but this could be extended to other

professional bodies. The disadvantages include the cost, and the possibility that normative skills may be insufficiently covered.

- b) For the support subjects, there may be an option to recognise a sufficient standard in a UNISA examination of equivalent material. This would require some work to be done in ensuring appropriate standards at UNISA.
- c) Allow a South African university to provide tuition and examinations through a process of distance learning. This would allow largely existing capability to be imported through improving technology and access. The Actuaries Without Borders section of the IAA is currently looking at these technologies, and a pilot is taking place in Zambia. This tuition and examination could then form part of a course for another university, or for students wishing to cover it on a short-course basis.

9.5 It should be noted that these thoughts around the structuring of the content of this phase are very preliminary, although the author's view is that it remains useful to split topics into supporting subjects and the more specifically actuarial content. There should a rigorous review of what is core content at this level; both in terms of adding new techniques and removing those that are outdated or no longer core. This may be usefully done at an IAA level or in co-operations with one or more of the English language actuarial associations.

9.6 In concluding discussion on this phase, consideration should be given to the award of a designation and specific membership category on the completion of this phase. This would provide some equivalence to the UK's proposed Certified Actuarial Analyst qualification, without the requirement to provide a parallel set of examinations, and will recognise those who have demonstrated that they understand and can apply the basic actuarial toolkit, and have some appreciation of what it means to be a professional. However, any membership class at this level would not be regarded as an actuary nor have the same membership rights as Associates or Fellows.

## 10. PHASE 2: HONOURS/PRELIMINARY WORK

10.1 This phase is something of a hybrid in that, while many students will continue with their actuarial studies at an accredited university for an honours-level degree, a significant number will commence work after a first bachelor degree. Broadly, this phase corresponds to the current Part A3 of the Actuarial Society syllabus, with the key themes of assets, liabilities and communication.

10.2 Within this broad correspondence to Part A3, however, the following key philosophical shifts should be noted

- a) The assets content may include some concepts from A205 (Financial Economics) not covered in the Undergraduate Phase
- b) The liabilities content should be strengthened to ensure appropriate coverage of key liability techniques such as valuation and pricing

- c) Material on asset-liability modelling, capital and risk will be covered in the Associateship phase rather than here
- d) The focus on normative skills here may be written communication, but this should be extended to thinking and examination skills required for later actuarial examinations, as per the proposed normative syllabuses.

Appendix C sets out the possible topics that could be incorporated in the Assets and Liabilities subjects.

10.3 While many students will complete this phase as part of an Honours degree, students who do not do a degree at this level or do not meet the required standards in the university examinations will be required to complete this phase. The options would be to outsource this phase to a university, or combination of universities, again possibly using distance learning, or to get the profession to set examination papers, as is already done for A302.

## 11. PHASE 3: ASSOCIATESHIP

11.1 This is a critical phase in that it is the first one in which all actuarial students will be in the workplace, as well as the final phase before a professional qualification can be attained. Even if many students continue onto Fellowship, it remains vital that the key technical and normative competencies are broadened and deepened during this phase.

11.2 Therefore, the proposed requirements of this phase include a focus on the core competency of the actuary as set out in 6.10: being able to understand financial and other risks, and apply this to a number of complicated problems. This builds from the technical toolkit in the first phase, and the deep understanding of assets and liabilities in the second phase.

11.3 In practice, the technical requirement for the phase would be covered by one subject, which would draw elements from the current Actuarial Risk Management and Enterprise Risk Management subjects, and possibly some applications in the specialised subjects. This subject could either be taught and examined by the profession, or developed by a university or group of universities, who could then teach and examine it. While this subject would probably not have sufficient content for students to attain the CERA designation, there could be a relatively small add-on requirement for those who wish to get this designation.

11.4 The technical content of this phase should be backed by the actuary's ability to deliver these skills in real-life situations. Extensive development has already been done around appropriate normative content for this phase, and in particular, integration of learning with skills learned at the workplace. The new Actuarial Professional Practice course, which is planned to be introduced by 2015, should provide a good grounding

in appropriate delivery skills, around communication, modelling, business awareness and professionalism. (Business Enterprises, 2013)

## 12. PHASE 4: FELLOWSHIP

12.1 This phase is primarily focused on specialising in a particular field and ensuring mastery in that field through in-depth knowledge and higher-order thinking skills. This would allow Fellow Actuaries to become thought leaders in their fields, fulfilling the vision of the Actuarial Society, and enhancing the reputation of the profession.

12.2 In practice, this specialisation would be assessed through the equivalent of two three-hour papers in the specialist field, which is similar to the current requirement of doing an F1 and F2 subject in a particular area. However, duplication with content in earlier phases should be avoided as much as possible, as well as any content duplicated in the F1 and F2 subjects in the current specialisations. This should allow a greater depth of specialisation than is seen under the current system. In addition, content that is relevant to Africa, and particularly practice in South Africa, could be spread over both papers.

12.3 For most specialist fields, the subject material would be specific to that speciality, but there may be some shared content/subjects –for instance, if there were specialities in Banking and Investments, they may share a common Finance and Investments paper, as is currently done in the UK. There may be other structures that could be explored to maximise synergies, such as a common insurance accounting component for General Insurance and Life Insurance. This may mean greater flexibility in the examination structure – so while the overall requirement is equivalent to two three-hour papers, this may require a different combination of subjects and assessments.

12.4 A key part of this specialisation would be the further development of normative/delivery skills, with a suggested focus on higher-order thinking skills and business strategy. This would support the Fellow Actuary playing a thought leadership role in their chosen special field. The draft syllabus for Actuarial Professional Practice 4, which is the proposed normative learning for this phase, may be a framework to instil these skills.

12.5 Within this structure, the much-debated research option debate will again become an issue. This paper offers two suggestions on how a research option can be accommodated, using the premise that for a learning profession, research should be encouraged:

- a) At a practice area level, part of the examination requirement could be waived in lieu of research at an appropriate level. This would then be a conscious decision within that particular practice area, and may lead to different requirements for different areas, allowing individual practice areas some leeway in deciding what is an appropriate mix of study/research to achieve mastery in that area.

- b) The entire examination could be waived in lieu of a major research work, which is suggested to be at Doctorate level. A special class of member could then set up, known as Research Fellows, who would have the same voting rights and responsibilities as other Fellows, but it would be clear that their speciality was via research rather than mastery in a practice area.

The author personally favours the second option.

### 13. QUALITY IN EDUCATION – THE STUDENT’S PERSPECTIVE

13.1 In a discussion of Lowther, McMillan and Venter (2009) around actuarial quality, it is noted that “the purpose of professional education is to prepare the professional to deliver a service of quality, and that in order to do this, both technical and normative capabilities need to be developed.” This paper so far has focused on technical quality, and ensuring the right things are taught, on the assumption that the normative quality will be largely established through the current normative developments.

13.2 However, there is another key perspective which is quality from a student perspective. The simple measurement of this may be in pass rates; if one assumes standards are fixed, higher pass rates would indicate that a greater proportion of students are acquiring the relevant skills. Given that there has been some disquiet about the low pass rates in the South African education system, a vision of our future education system should focus on improving these outcomes.

13.3 There would appear to be two focus areas in looking at improving pass rates; ensuring appropriate assessment, and providing support to students in studying and examinations. In terms of ensuring appropriate assessment, the technical content of the syllabus should still be assessed with a written, unseen examination as this remains a proven method of testing knowledge, understanding and higher-order skills. Consideration should also be given to including some element of coursework, including assignments, as part of the final assessment. This approach has now been adopted by the Australian profession, and encourages ongoing learning.

13.4 Support of students in studying and examination technique is a critical area. A first step is making the pass rate a key performance measure of the education system so that a target (e.g. 50% pass rates for the later subjects) is established, while at the same time complete independence of the examiners is maintained to ensure that this is achieved without compromising standards in the slightest. One aspect of the proposed curriculum structure that should assist pass rates is the fact that students should only be doing specialised subjects in areas in which they are getting practical work experience.

13.5 Success in this area will therefore rely on a partnership of students, educators and the Actuarial Society. In this respect, the Actuarial Society should offer support in

study and examination techniques and, indeed, this is incorporated in the proposed Phase 2 of the normative skills development, which is generally where students find the more conceptual exams more challenging. In particular, language skills become important at this stage, and with a high proportion of students not having English as a first language (Tahwa, 2012), a focus on written communication in this phase is critical. This is doubly important in terms of the transformation of the South African profession and outreach into Africa.

## 14. IMPLEMENTATION

14.1 When one compares where the South African education system is now and the vision set out in this paper, and adds to that vision the desire to make this the education system of choice in Africa, there is clearly a huge amount of work required. In particular, the development of syllabi and learning materials in Phases 2 and 3, and the resources required to make this accessible to Africa is a huge task, probably greater than the initial establishment of the South African education system. The South African profession, while still large compared to the IAA member average, faces a small resource base compared to the giants in the UK and USA.

14.2 However, the size of the task should not be too daunting, as one should be encouraged by the history and legacy of the South African profession to date. The current developments in education, in particular the normative skills, and pensions and banking, are all world-leading and consistent with the vision offered in this paper. As one looks towards the end of the decade, there may be more resources available to accelerate our education developments due to two main reasons, namely:

- a) The completion of significant changes in financial reporting, in particular on the solvency side (Solvency II, SAM) and accounting (IFRS 4 Phase 2).
- b) An increase in the potential supply of actuaries who may be able to assist with developing education.

In supporting the second point, it should be noted that the number of Fellow actuaries in South Africa accelerated in the mid 1980s and early 1990s. By the end of the current decade, many of these actuaries may be open to a career change, specifically assisting in education developments. It may also be possible to steer more recently qualified actuaries to be involved in education, possibly by making this advantageous from a CPD perspective.

14.3 The author accepts that these are presumptions and not certainties. However, these factors provide some hope that there may be people willing to provide significant input in growing our education capacity. This is in contrast to the current situation where finding the appropriate people is more of a constraint on developing education than finding funding.

14.4 One of the important pieces of work that will need to be done to support this education vision of an actuary as a person with a mastery of understanding and modelling risk is the development of teaching capacity in many of the Enterprise Risk Management topics. This should ideally include the teaching and examination of the current F106 (ST9) material in universities, leading to recognition from the CERA Board that we have a homegrown capacity to award the CERA designation.

14.5 Universities are an absolutely critical part of the education process in South Africa, and will probably have a role to play in all four phases. The development of universities in the rest of Africa is viewed by many as critical to developing professions in those countries. The proposals in this paper attempt to introduce some flexibility around what and how universities teach student actuaries, but with the critical proviso that standards are kept high. It is important that universities are co-creators, with the profession, of the future education vision and a key partner in the delivery of this vision.

## 15. CONCLUSION

15.1 Jim Collins refers to BHAGs (Big Hairy Audacious Goals). Certainly, the vision of an African education system that is world-leading, accessible to much of the continent and transforming of the profession in South Africa may well be audacious.

15.2 And yet, just as the many of the elements were in place for the initial localising of the actuarial qualification, many of the elements are in place to achieve the vision. Aside from the South African spirit of achievement in adversity, and the reputation of the South African profession as leaders internationally, we have some acknowledged education leadership in banking, health and care, and normative skills (Shepherd, 2010). In addition, there is an increasing capacity from a technological perspective to use distance learning and make the virtual classroom almost as effective as the real one.

15.3 The vision of where we want to be in 2020 will need to be a collaboration; this paper merely serves as a starting point. However, to use an analogy of another passionate South Africa, Lance Klusener, let's dream big or else go home!

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## APPENDIX A: CURRENT REQUIREMENTS FOR PROFESSIONAL DESIGNATIONS AWARDED BY THE ACTUARIAL SOCIETY (ASSA, 2013b)

### 1) Associateship (AMASSA)

Students are required to complete all the components below to be admitted as Associates:

#### Part A1 (Foundation Technical)

A101: Probability and Mathematical Statistics

A102: Economics

A103: Finance and Financial Reporting

#### Part A2 (Intermediate Technical)

A201: Financial Mathematics

A202: Models

A203: Contingencies

A204: Statistical Methods

A205: Financial Economics

#### Part A3 (Core Principles)

A301: Actuarial Risk Management

A302: Communications

#### Part A4 (Associateship Professionalism Skills)

A401: Business Awareness Module

A402: Model Documentation, Analysis and Reporting

A403: Associateship Work-based Skills

A404: Associateship Professionalism Course Student Handbook

### 2) Fellowship (FASSA)

Students are required to complete all components in Parts A1, A2 and A3 as set out above. Students must also complete two subjects in Part F1, one subject in the F20x range, F210 and all subjects in Part F3.

#### Part A1 (Foundation Technical)

A101: Probability and Mathematical Statistics

A102: Economics

A103: Finance and Financial Reporting

**Part A2 (Intermediate Technical)**

A201: Financial Mathematics

A202: Models

A203: Contingencies

A204: Statistical Methods

A205: Financial Economics

**Part A3 (Core Principles)**

A301: Actuarial Risk Management

A302: Communications

**Part F1 (Fellowship Principles)**

F100: Alternative Fellowship Principles

F101: Health and Care Principles

F102: Life Insurance Principles

F103: General Insurance Principles

F104: Pension and Other Benefits Principles

F105: Finance and Investment Principles

F106: Enterprise Risk Management Student Handbook

**Part F2 (Fellowship Applications)**

F200: Research Option

F201: Health and Care Applications

F202: Life Insurance Applications

F203: General Insurance Applications

F204: Pension and Other Benefits Applications

F205: Investment Applications

F210: Generic Practice Module

**Part F3 (Fellowship Professionalism Skills)**

A401: Business Awareness Module

A402: Model Documentation, Analysis and Reporting

F303: Fellowship Work-based Skills

F304: Fellowship Professionalism Course

**3) CERA**

Students must have completed all the requirements to be admitted as a FASSA or AMASSA. In addition, they need to complete the following subjects.

F106: Enterprise Risk Management

C100: Applied Enterprise Risk Management Course

## APPENDIX B: DETAILS OF POSSIBLE 2020 CURRICULUM STRUCTURE

### Phase 1: Undergraduate

**Aim:** Developing the basic actuarial toolkit to build, understand and apply models of financial and other risk, including an understanding of the economic context of these models. In addition, developing an understanding of what the actuarial profession entails, and how these techniques allow the actuarial professional to meet the professional promise.

Competency will be required in the following:

#### Support subjects

Mathematics

Probability and Statistics

Accounting

Finance and Investments

Economics

#### Core actuarial techniques and practice

Introduction to the Actuarial Profession

Principles and Practice of Actuarial Models

Financial Mathematics

Actuarial Models for Long-Term Financial Risks

Actuarial Models for Short-Term Financial Risks

### Phase 2: Honours/preliminary work

**Aim:** Demonstrating an ability to understand in detail the assets and liabilities of the major types of financial institution, and apply actuarial techniques to practical issues around the assets and liabilities. In addition, demonstrating the ability to communicate this understanding effectively in written form.

Competency will be required in the following:

Assets

Liabilities

Communication

### Phase 3: Associateship

**Aim:** Demonstrate an ability to understand the interaction between assets and liabilities of the major types of financial institution, as well enterprises in general, through the holistic understanding of risks, capital requirements and asset/liability modelling. This understanding must be applied to a number of practical issues in the management of these institutions, while the student actuary must also demonstrate competence in a number of areas of professional practice.

Competency will be required in the following:

Actuarial Risk Management

Actuarial Professional Practice

#### **Phase 4: Fellowship**

**Aim:** Demonstrate an ability to understand, analyse, synthesise, apply judgment and deliver the professional promise to financial and risk management issues in a specific practice area, in order to play a significant leadership role in the specific area, as well as demonstrating that higher-order actuarial skills can be applied in a variety of contexts.

Competency will be required in technical and normative skills in one of the following areas:

Life Insurance

General Insurance

Health and Care

Pensions/Retirement

Banking

Investments

### **APPENDIX C: POSSIBLE TOPICS COVERED IN THE TECHNICAL CONTENT FOR PHASES TWO AND THREE**

These topics broadly cover much of the current content of subjects A205, A301 and F106, as well as some topics from other F1, which includes 12 hours of examination. Therefore, each of these three broad subjects set out below could be examined with a four-hour paper, although other forms of assessment could form a portion of the final overall performance of a student. The below is a very rough attempt to create some indication of the flavour of each of these subjects. Extensive work would be required to ensure appropriate content by enhancing, adding and removing topics where appropriate.

#### **Assets (Phase 2)**

Investment environment/main asset classes (A301)

Utility theory (A205)

Behavioural finance (A205 from 2014, previously F105)

Measures of investment risk (A205)

Mean-variance portfolio theory (A205)

Single and multifactor models of asset returns (A205)

Asset pricing models (A205)

Efficient market hypothesis (A205)

Stochastic models of security prices (A205)

Option pricing (A205)

Term structure of interest rates (A205)

Asset management (A301)

Performance measurement (F105)

### **Liabilities (Phase 2)**

Main products/operations of main financial services (A301, some other F1 content, additional banking content)

Contract Design (A301)

Data (A301)

Modelling (A301)

Assumption setting (A301)

Costing/pricing (A301)

Reserving (A301)

Options and guarantees (partial) (A301)

Monitoring experience (A301)

In general, some of the A301 content would be strengthened with examples from F1 subjects.

### **Actuarial Risk Management (Phase 3)**

Key stakeholders (A301)

Relationship between assets and liabilities (A301)

Maintaining profitability (A301)

Reporting results (A301)

Surplus management (A301)

Insolvency and closure (A301)

Options and guarantees (partial) (A301)

Risk environment (A301, F106)

ERM framework (A301)

Risk management principles (A301, F106)

Risk identification and classification (A301)

Risk measurement (F106)

Analysing and mitigating market risk (F106)

Analysing and mitigating credit risk (A205, F106)

Analysing and mitigating operational risk (F106)

Regulatory environment, including main solvency regimes (A301, F106)

Capital requirements (A301)

Economic capital (F106)