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In honour of Prof. Ekhaguere at 70

Secrets of the masters: model-based hyper-performance in the corporate-academic business of life

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Abstract. We are intrigued by the fact that there seem to be *paradoxes* in the education and career development of university graduates, academics and professionals, due possibly to a misunderstanding of single versus cross- or multi-disciplinary emphases in their training. Whatever the emphases are, some students and academics are not properly trained in the craft of creatively structuring their learning, in such a way that they can be *continually productive* in their career life-spans and beyond. For example, most graduate students may just implement the research ideas already proposed by their supervisors, only to secure PhD degrees that they may not easily link to their life goals. We think that understanding the *career scripts* which inform recognized success on the part of highly productive academics, and encasing the dynamics of such careers in a *transactional model* is a good way to develop productive manpower in *knowledge work*. This paper therefore examines the lives of some mathematical scientists and shows how one can use the experiences to construct a corporate-academic *career optimization model*, CA Model. The model will enhance the capacity building and wealth-creating efforts of a society when used in training the workers, for which reason it is linked to knowledge management, human capital development, academic entrepreneurship, and economic development. The paper formalises the mechanisms underpinning *global corporate academicism* in a way that can enable the processes to be taught to others. In a sense, the paper provokes a feeling that 'over specialisation' in knowledge work somehow engenders a Great Deception in Modern Academia.

Keywords: contemporary mathematics, CA model, optimization of human potential, practification, knowledge management, global corporate academicisim, capacity building, economic development.

1. Introduction

When I was invited to present some papers including this one at the International Conference in Contemporary Mathematics and the Real World, in honour of my friend and collaborator, Professor G. O S. Ekhaguere *FAAS*, I had to appraise myself of what exactly is meant by Contemporary Mathematics. As one would expect, it is applicable mathematics that addresses itself to significant real-life problems. It develops critical thinking beyond conventional boundaries of classical mathematics, science and technology. It draws from all mathematical techniques that are amenable to creative problem-solving, namely statistics, practical geometry and logic, calculus, mathematical modelling, and their graphical representations. The fields of applications can be as diverse as rocket science, business mathematics, marketing, advertising, and personal finance, Brechner and Bergeman (2015). I strongly feel that Professor Ekhaguere is really an archetypal contemporary mathematician and Global Corporate Academic (GCA), in ways that will be clarified in this paper.

The significant real-life problem addressed in this paper is how to use mathematical thinking to develop more effective ways of conducting the core academic business of research, teaching, learning, assessments, consulting, and community services, in modern universities. The core problem is how

to do this such that in addition to outstanding research-teaching excellence, emerging results from academic work are impacting society more visibly, via pronounced wealth-creation and national socio-economic development (Ezepue and Ojo 2012, Ezepue 2015, Ezepue & Ekhaguere 2016).

The unifying concept explored in the paper is a Corporate-Academic Career Self-Management Model (CA model) which facilitates these new ways of working. The CA model optimizes three work domains within which career progress is managed, namely the *primary research domain* (PRD), the *primary application domain* (PAD), and *general cultural literacy* (GCL). The model assumes that players strive to own specialist PRD areas that define their *academic identities*, identify PAD fields in which they mainly apply the specialist skills, to significantly impact the society, and conduct wider GCL work in cognate fields, to acquire all-round knowledge that gives them an *edge* in the two main domains.

For this, the paper outlines the *pseudo-mathematical thinking* behind CA model development and its links with the highlighted terms in the abstract. We will use the model constructs to explore how humans segue success and climb the career ladder in diverse areas of knowledge work. The term 'pseudo-mathematical' 'declares' that it is not ultimately necessary in this kind of *soft mathematics*to seek to obtain so-called analytical solutions to the *state equations*which define academic career success in the CA model. The quest for a corporate-academic model is primarily phenomenological, as it seeks to capture the career dynamics of *corporate academics*, and contrast this with those of traditional academics, who dominate university life today. Corporate Academics (CAs) run career scripts that mirror the CA model in the sense that they see their intellectual work as a business, a Me.com. This way, they use ideas from strategic planning and performance management to plan for and achieve success in their careers, in some ways more satisfying than is possible for equally-talented others who do not operate in such a model-based way.

To recall how it all began, sometime around 2003 I had discussions with one my colleagues at Sheffield Hallam University,UK (SHU), Dr Leo Vefghi, regarding the intense workload that life as a lecturer demands - juggling research, teaching and consulting commitments of the core university business. Following the discussion, it struck me that it would be better to apply the techniques for managing traditional businesses to this core university business. This requires an academic to reconsider their work as not necessarily being employed by the university, but selling their skills to the university, suggesting the need to run the academic business as their personal business. It does not matter that the reward is mainly in form of a monthly salary. It rather matters that this approach is more likely to boost the academic's performance and personal effectiveness more than a traditional academic mindset allows.

This simple corporate-academic idea was developed into aneight-thousand-pounds (£8000) grant from SHU, as part of a two-year University Learning and Teaching Fellowship. The initial research results were presented at an annual learning, teaching and assessment (LTA) conference of SHU, follow-on conferences at SHU and Hawaii (Ezepue 2004, 2005, 2006) and Senegal (original version of this paper), and later published as Ezepue (2012b).The ideas were extended in Ezepue and Ojo (2012a). Early promises shown by the initial research results were indicated by the fact that when I submitted the conference paper Ezepue (2012b) to the *2009 Knowledge Management Africa Conference*, held at Dakar Senegal, and was planning to use university funding to attend the conference, I received an email from the organisers that the paper was selected as one of the key note papers, for which reason the organisers would pay for the conference costs.

The psychological boost which the CA model inspires in my work has led to the founding of the African Higher Education and Research Observatory UK in 2005 (www.afrihero.org.uk) now extended globally to Oselux World Higher Education and Research Observatory 3E in 2017 (www.oseluxworldhero3e.com). These higher education charities serve as practice theatres for the

intellectual ideas emanating from my corporate-academic research. The model helps CA players to cope with the realities of getting ahead in complexly uncertain and hard-driving ecosystems such as today's modern university environments.

We note that there is no universally best way to model soft career issues; hence the aim of this paper is to explore different ramifications of the modelling process, towards realizing *parsimony*in the final model choices, and maximal *fittingness*with different realities which describe CA players' *dispositions* and *aspirations*. For example, we need a model that says as much about a beginning mathematical scientist who aspires to attain a professorship in a *narrowly defined* research area (differential equations and geometry, for example), as one who aspires to a professorship through a *multidisciplinary*combination of geometry with its applications in other fields, for example image analysis and cosmology. Similar combinations can be forged in other broad fields of study, for instance sociology with political science, economics with history, economics with computing, statistics with economics, or mathematics with philosophy. The reader may have started sensing the fact that the CA model rests on effective use of multidisciplinary knowledge by CAs to become hyper-performing knowledge workers.

Section 2 provides intuitive presuppositions of the CA model. Section 3 is a brief random walk through the life stories of selected eminent mathematical scientists, which shows how their careers mimic the CA model. The stories are taken from the text *One Hundred Reasons to be a Scientist*, published by the Abdus Salaam Centre for Theoretical Physics (ICTP) in 2004. Section 4sketches out the mathematical presuppositions of the CA model and section 5 visualises the character and economics of the model. Section 6 discusses typical public intellectual work informed by the model and section 7 links the model to knowledge management. Section 8 explores further affordances of the CA| model in capacity building, for example, while section 9 summarises and concludes the paper.

2. The intuitive presuppositions of the CA model

The original thinking around the CA model and its implications for the optimisation of academic productivity and human potential was presented in previous proof-of-conceptpapers (Ezepue 2004, 2005, 2006, 2008). By academic productivity we mean something more than traditional academic emphasis on journal papers, which is unarguably fundamentalto what academic work is about, and includes research-teaching excellence and high-impact academic work that addresses significant challenges in the real world. We believe that all disciplines, rightly explored as to their theoretical constructs, potential applications, contributions to specific industry sectors, and combinations with cognate disciplines to reinforce these elements, can be 'professionalised'. Our new term for this is 'practification'.

Practification, as opposed to formal practice which it includes, requires continual rethinking of contexts, situations, problems, and challenges facing significant stakeholders in society – individuals, organisations, and government – using everyday situations obtained from wide readings, referred to as General Cultural Literacy (GCL) in the CA model. This lends a sense of holistic realism to the quest for meaningful knowledge, not typically encountered in traditional case studies within a technical field, or end-of-programme theses and dissertations.

Take mathematics for example. A thorough exploration of mathematics as the foundation of STEM disciplines (even logic in law) shows its immense applications in such diverse fields as financial mathematics and investing, theoretical physics and its applications, cybersecurity using abstract algebras, rocket science, mathematical biology and epidemic models, economics, and interestingly the mathematics of love and dating algorithms. The point is: do we research and teach

this beautiful subject, both in its pure and applied varieties, in ways that encourage aspiring mathematicians to see these connections? Do we run laboratories or collaborate with stakeholders in the emerging research results, such that students are immersed in deep learning of these possibilities, thereby continually practising mathematics on all manner of problems amenable to mathematical solutions? Is the subject connectedly *'practified'*, with students continually exposed to case stories of its applications, and subjected to creative problem-solving of unstructured problems, which mathematics helps to structure initially, even though the ultimate solution may require techniques in related disciplines which other experts can contribute?

To achieve these goals, I have proposed in Worldhero 3E a big-theme doctoral research programme that facilitates the practification of mathematical sciences, namely *The Pedagogy of Selected Mathematical Sciences: Industry Trends, Entrepreneurship, Enterprise Development and Employability Perspectives*. Thirteen replica topics extend this programme to other disciplinary clusters 'practified' in Worldhero 3E, www.oseluxworldhero3e.com/3e-education.

The above problems about overly traditional approach to researching, teaching and applying higher education disciplines underpin why we could remain underdeveloped, if we do not address the depths to which we train academics, students and professionals, and the requisite curriculum innovations. Hence, we instituted www.oseluxworldhero3e.com as a giant laboratory for achieving the practification and professionalisation of selected disciplines within our ken. It is clear to us that traditional academia is too linear in its performance metrics to allow such immersive experiences in the pedagogy of the mathematical sciences. Some of these failings in modern academia are explored further in Ezepue and Ochinanwata (2017) and Ezepue and Ojo (2012a), which show how Nigerian higher education, in particular statistics teaching, should be innovated in research, teaching, learning, assessments, consulting, and community services, and how the innovations should produce spin-offs in form of for-profit and social enterprises that address related socio-economic development needs in the country, linked to the 2017 budget.

Thecombination of PRD and PAD disciplinary ideas in the CA model is supported by the following quotes with my own emphasis in brackets:

> *"One of the principal challenges of our world to the individual is that he must not only achieve a fairly high degree of specialization [PRD] to make him a useful member of society, but at the same time achieve enough general knowledge to enable him to look with sympathy and understanding on what is going on about him [PAD, GCL]"* – Oliver J. Caldwell
>
> *"In all living, there is a certain narrowness of application which leads to breadth and power [PRD]. We have to concentrate on a thing in order to master it. Then we must be broad enough not to be narrowed by our specialties [PAD, GCL]"* – Ralph W. Sockman

As an illustration, consider two academics with nearly identical qualifications in statistics with stochastic modelling as the primary specialization (the PRD), say. One structures his career to consist mainly of pure research in the key topic areas of stochastic modelling and the other retains this core structure, but enriches it with a well-defined area of application, for example finance and business or global economics (PADs), plus managed readings in a number of related fields such as applied economics, heuristics, strategic decision making, philosophy of research, psychology, politics, sociology, soft systems modelling,and data science (as GCL elements). Clearly, with little additional amount of work in the three domains the latter would be far more productive theoretically and practically than the former. This is because *interactions* amongst ideas in the three domains could be nonlinearly exploited in the way work is enacted. We would like to know to what extent typical CA types use this academic *career script* as a basis for the phenomenal success they achieve. If we arrayed academics on a scale that describes how closely their *business models* approximated the CA model,

would there be significant differences among their *attitudes* and *productivities*? How should the productivities be integrally measured across the key facets of the core university business indicated above, summarised as research, teaching, learning and research-teaching impact?

3. A random walk through the mathematical sciences with implications for corporate-academic career modelling

Academics are not social lab rats that could be so easily manipulated. Our chances of achieving a close match to this scenario could be a longitudinal study of beginning academics, but it is not easy to get academics to adopt strategies that are not their preferred options in a controlled experimental set up, for several years. Hence, as an evidence base for these explorations, we think that the life-stories of high-achieving scientists in the text *'100 Reasons…'* will help us to establish some grounds for the modelling, albeit not as strongly as a full experiment. We present this evidence as a running narrative within which we roughly identify fields that could be assumed to be equivalents of the three CA domains. Following this *meta-analysis*, we discuss new insights on CA modelling which the notes suggest.

In effect, we hope to use lessons learned from this paper as bases for *training*, *guiding*, *counselling* and *mentoring* would-be CA types in the art and science of *hyper-productivity*. These efforts amount to a professionalization of mathematical sciences in *knowledge transfer*, which is adaptable to almost every discipline and field of knowledge work, for example banking and fund management. See the above-mentioned doctoral research programmes.

3.1 The narrative of selected mathematical scientists' life and success stories

In the chapter by Abdus Salaam titled *'Science & Scientists in Developing Countries'*, it is noted that Salaam had a first in the Cambridge Mathematical Tripos examinations and theoretical physics, and a PhD in Theoretical Physics. Salaam was later awarded the Nobel Prize in physics together with Sheldon Clashow and Steven Weinberg for their '*unification* of electromagnetism and the weak nuclear forces in the electroweak theory'. Salaam later established the *International Centre for Theoretical Physics (ICTP)*, Italy. Even before this, Salaam had established one of the best *theoretical physics research groups* in the world at Cambridge. The overriding goal for Salaam and all of us as mathematical scientists must be to increase the numbers of scientists and their *quality*, and to engage in *public intellectual work* that changes the image of science and technology in the developing world. This will make it easier to attract top talent into the fields. We glean from this story the fact that mathematics, theoretical and experimental physics were Salaam's PRD and PAD engines; the GCL would appear to be mathematics itself and issues about development of human capital in these fields.

In *'My Life in Science'* by Andreas Accrivos, Levich Institute, City College of Cuny, New York, USA, we learn that Andreas studied *mathematics* and *classics* for the BSc and later had a PhD in *chemical engineering*. We deduce from the story that Andreas has the PRDs as mathematics and chemical engineering, the PAD as mainly chemical engineering and a GCL range of interests which includes history, classics, and thermodynamics. Andreas's PhD thesis is a *'mathematical study of multi-component distillation'* (at that time a *hot topic* in chemical engineering), in which he invented a new integral transform to solve the relevant mathematical equations analytically (unfortunately, the invention does not seem to have any *further use* [**1**]). As a way of maintaining his productive efficiency and longevity, Andreas took interest in *fluid mechanics* at Berkeley, literally *from scratch*!

Simultaneously as he was gaining familiarity with the new field, Andreas attracted many *exceptional graduate students* which boosted publication of widely cited high quality papers [**2**]. Later in 1962 at Stanford, Andreas formed the Chemical Engineering Department with a few colleagues; the department was one of the best on an *international scale*, again with research flourishing with the support of another group of exceptional graduate students. Without quoting corresponding dates which are in the full story, Andreas gained prestigious national honours, for example Fellow of the US National Academy of Sciences, the National Medal of Science White Honour and was *Editor* of the journal *The Physics of Fluids*. Andreas finds in fluid mechanics a *perfect combination of experiences* some of which are quite striking, including sophisticated applied mathematics, for example asymptotic analysis, high-powered numerical calculations, a combination that sustains *interest* and *productivity* at the confluences of disciplines [**3**]. Note that the CA model naturally inspires such combinations among ideas from the three domains (PRD, PAD and GCL). Hence, the model potentially expands the scope of what an academic or knowledge worker could achieve in model-based career self-management.

A more detailed review of the stories reveals in general the character of profound excellence in their academic callings exhibited by the scientists. These attitudes include: learning ideas actively via *intense problem-solving*; undertaking a *whole graduate curriculum* at Princeton; being able to work within *larger mathematical frameworks* (see Penrose 2005 for hints on such connected and deep learning); the power to *unify* contending paradigms in cognate areas of study; the ability to justify theoretical work in the PRD with meaningful applications in the PAD (literally being able to eat one's cake and have it); similarly having the luxury to enjoy the *'power of science and its beauty'*; to make 'imaginative leaps across disciplines'; and having skills of *problem identification*, *appreciation*, *explanation* and *communication* to wider society, essentially skills of *public intellectualism*.

I emulate these principles by actively using acquired research results in the PRD-PAD-GCL knowledge production complex, to creatively solve value-adding problems in society. I also engage in wide-ranging capacity building and public intellectual work via academic research in different research and enterprise schools and related social enterprises in Afrihero-Worldhero 3E. I had to undertake a postgraduate certificate training in business administration at Manchester Business School, UK, and a postgraduate certificate for learning and teaching in higher education from Sheffield Hallam University, UK. In a sense, the CA work ethic evokes a transcendental capacity to produce or acquire knowledge at a fast pace, and along the lines assimilate the disciplinary know-hows it takes to do so, almost effortlessly [**4**].

The different types and pathwaysof knowledge production in mathematical sciences which the stories portray - grand unifications of ideas and theories and their adaptation into niche contexts - require *idea generation*, *originality* and *creativity* skills; see for example work in the 3E Innovation and Creativity Research and Enterprise Development (RED) School (www.oseluxworldhero3e.com/3e-education-2). CA modelling is itself a very good illustration of these ideas. How corporate academics (CAs) and graduates from innovative learning, teaching and assessment (LTA) programmes, can exhibit these characteristics in their writings (of texts, research monographs, academic papers, and consultancy reports), should also be discussed in lectures, summer schools, seminars and training workshops.

The CA model is naturally *connectionist* since it links PRD and PAD ideas in resolving theoretical and practical problems. In this process, much as dwelling in different mathematical and physical ideas does for most of these scientists, the GCL provides a rich base of *analogies* and *metaphors* that creatively facilitate the connections. Hence, there is strong evidence of *CA-ness* in the academic ways of these prolific scientists; evidence of this is even more forcefully demonstrated in Penrose (2005),

an intellectual tome that is a tour de force in the mathematics and physics of reality, which is replete with quotes from literature, philosophy, and molecular biology, among many other disciplines [**5**].

Some of the gains from the model include very effective linking of a player's core academic duties, for example teaching, research and consulting, such that insights from each informs further useful work in the others. Hence, a natural CA player is also a dedicated teacher whose research and consulting experiences help to train students effectively in applied technical skills needed for socio-economic development of a country, Ezepue and Ojo (2012a). Compare this to the practice of some single-discipline academics who see their race to a professorship as mainly a question of research excellence, even if at the expense of their teaching. Hence a natural CA benefits from collaborations, discussions and academic outcomes with their students, as the above case stories portray.

Most of the stories in the above-mentioned text talk of the need to *get our science to produce important technologies* [**6**], but originality in research and problem-solving skills are needed for this to be realized. The CA mindset facilitates such innovations. For example, the originality of CA modelling itself has led to the idea of a *Careersoft* software we are currently developing to automate the career guidance of would-be CAs. Other related CA 'technologies' include: **a)** a Corporate Academic Research Structuring System (CARESS ©), which enables novel CA model-based graduate research topics to be formulated with outstanding theoretical and practical contributions to knowledge; **b)** a similarly novel process for structuring bestseller texts, research monographs and training manuals (STELLARTEXT ©); and **c)** an innovative model for enhancing research-teaching excellence and impact among academics in Africa and developing countries, known as the *African Research and Teaching Excellence Framework*(ARETEF ©). This framework adapts a global variant, Global Research and Teaching Excellence Framework (GLORETEF©) to the peculiarities, resource bases and needs of African higher education institutions. Hence, the frameworks encompass elements from current models used in developed economies (for example the UK Research Excellence Framework), but with further considerations of the *socio-cultural contexts* of developing economies, in a way that accommodates innovations in teaching research, consulting, and wider perspectives on research impact through community services and creation of knowledge-based businesses.

Getting academics, students and professionals to understand the habitats of different real-life problems they can resolve, requires a GCL-based knowledge of significant *world systems* which embody the types of problems they are concerned with. Examples of these world systems are health, education, economic and political systems, and the strategic national, regional, and global development goals which surround related problems, typified by the 2030 United Nations Strategic Development Goals (SDGs). Hence, we instituted a School of Global Issues and World Systems in Worldhero 3E, to train academics and students on these opportunity recognition skills (www.oseluxworldhero3e.com/3e-education-4).

Another component of the Careersoft is **d)** a radical model of publishing that democratises higher education and capacitates authors to produce works that cover the canvas of CA and 3E ideas more creatively; see Global 3E Publishing (www.oseluxworldhero3e.com/3e-education-2-2-2). The innovations in this publishing programme directly deal with the perils and injustices in legacy publishing by traditional publishing firms, who extract multiple rents from authors and their institutions. These rents include: paltry royalties to the authors themselves (circa 10%-15%); license fees levied on higher educational institutions to have physical and electronic copies of the works in the libraries; in the case of journal papers, charging authors fees to download their own papers for further use (sometimes up to £50 per paper); and complete transfer of copyright to the publishers, which maintains a life-time steady income stream for them at the expense of the authors. Hence, we run a cooperative model of publishing that pays authors up to 50% of the net gains from publishing their works. In addition to these goals, we have also extended the usual quality metrics for

evaluating excellent and high-impact research from about three main criteria in traditional journal publishing to seven in 3E Publishing. More detailed notes on the stiff criteria of excellence in 3E Publishing, including a more rigorous six-step process for Afrihero-Worldhero journals, which demonstrate significant pathways for really building products and services from research results, is provided in Ezepue (2016). We now continue the notes on the technological affordances of the CA model.

To expatiate on the power of these technologies, the corporate-academic research structuring system (CARESS©) naturally structures PhD topics that almost always are implementable as companies which sell the research ideas to concerned stakeholders, much in the same way as the Google Corporation emanated from one of the founder's PhD thesis at the Massachusetts Institute of Technology (MIT), USA. The thesis point here is that a model of academic research that emphasises, where possible, the creation of patents that warrant meaningful applications of knowledge, and firms that organise such applications, is long overdue in Nigeria, Africa, and the developing world generally.

An example of such technology innovations in the story *'My Life as a Scientist'* by Bloembergen is that he won a Nobel Prize for developing the magnetic resonance imaging (MRI) process which predated current practice at that time. The fact that most Nobel Prize winners fit this archetypal CA types who combine disciplines, shows why the CA model justifiably emphasizes primary research in the theoretical aspects of a science or field of specialisation, as well as its possible applications in a PAD, more so since the Nobel Prize recognizes *significant societal* or *profound theoretical* impact of a discovery [**7**].

In *Sixty Odd Years of Fluid Dynamics*, Peter Bradshaw, Stanford University, USA, represents a PRD-PAD core research programme in aeronautical engineering and fluid dynamics. He notes that research, like truth, is *'rarely pure and never simple'*. He discountenances the science versus technology dichotomy in research thinking, in favour of *science with/and technology* [**8**], which is a re-enactment of the PRD-PAD combination in CA play. We learn that *'science is seeking knowledge of how and why the universe works, and technology is making use of that knowledge – for good or ill'*. In effect, the CA model provides *qualitative insights*into individual, as opposed to wider organizational, knowledge management, and the resultant production of high-impact academic artefacts. It forces a long-overdue consilience between core disciplinary research and its translation to practice, which underpins wealth creation in a society.

In his *A Life of Literature, Science, Engineering, Business and Public Policy*, the prodigious D Allan Bromley, Yale University, combines English, Engineering Physics, and Nuclear Physics, and graduated more PhDs than anywhere in the world. He held multiple Directorships in several New York Exchange companies, expanded the cooperation and communications amongst more than twenty government agencies having substantial research and development portfolios, with *big-theme research programmes* that require strategic collaborations among different stakeholders. Bromley raised *over $50m* for projects. Interestingly, he published more than *500 papers*, authored and edited more than *20 textbooks*, received *33 honorary doctorates* from universities in Canada, China, Italy, SA and USA. Bromley advises that *changes of field* are acutely important in maintaining intellectual interest and activity [**9**]. Clearly, this advice is inherently facilitated by the combination of knowledge bases afforded a player by the CA model.

To avoid gender bias in our examples from the text *100 Reasons*, we note in *Kindling & Sustaining Physics* that similarly to Bromley, Mildred S Dresselhaus, MIT, USA, packs into her academic career the following elements: a strong pre-college academic programme; Fulbright Fellowship to Cambridge University; experiences in Harvard University, University of Chicago, Cornell

University, MIT Lincoln Labs; Full Professorship of Electrical Engineering at MIT; trained *65 PhDs* and *30 post-docs* and smeared the public service with enviable records and numerous awards.

In *The Making of an Academic Economist*, Partha Dasgupta, University of Cambridge, UK, weaves a career that combines BSc Mathematics with graduate work in Particle Physics, and later Economics. Dasgupta treats us to the following important ideas in the *progression of scientific thinking*:

- The fact that problem types could be *hot*or *non-hot* **[10];**
- The need for general results such as identifying conditions sufficient for a market system to sustain an efficient allocation of resources;
- The fact that as the real world is at best a blur, theory has to cover all possible worlds (this echoes the PRD-PAD broadening of a CA players' intellectual base);
- The need to work on *strong special models* and *extend* them to cover more general grounds (in a *synthesis*, say); and
- The search for comprehensive measures of human well-being, including *happiness* and *success*.

As noted above, this progression can be developed within CA thinking. Indeed, CA modelling mirrors the progression. For example, application of CA thinking to academic work is a strong special model which can then be extended to other areas of knowledge work, for example banking, real estate management, business and management, as earlier noted. There are hints in these notes of the fact that CAs are attracted to the PRD and PAD domains with *different appetites*, so that in using the model for career advising we must elicit such propensities from advisees. For example, in *A Life in Science*, Sam Edwards (PhD Theoretical Physics), Cavendish Laboratory, Cambridge, UK, says:

> *'I found myself more attracted to the scientific [PRD] rather than technological [PAD] side of things – what were the basic laws of physics rather than its applications in engineering, what were the basic pathways of chemical synthesis rather than purposeful design of materials and drugs … [a matter of what one can do]'.*

Such a player in CA world would simply have a *dominant PRD*, but that does not preclude the CA from benefiting from combined insights from the three domains.

An important aspect of the ways of science which must be properly inculcated in CAs and *holistic learners* is the setting and resolution of big hilarious and ambitious goals (BHAGs) that benefit wider society (Robbins 2001). These grand challenges typically demand long-term intellectual commitment of scientists. For example, I have persisted in advancing the CA Model as a hidden force of hyper-productivity in knowledge work since 2004 (13 years at the time of writing this paper). This is despite the fact that the kind of *managed multidisciplinarity* explored in the model is not the seemingly preferred model of academic career progress, compared to a single discipline-based specialization in the form of a strong PRD mainly. We need to inculcate in new faculty this attitude of *intellectual persistence* required to generate creative solutions to systemic organizational and societal problems.

We explain that *managed multidisciplinarity* is an organised way of choosing and reacting the PRD, PAD and GCL domains of the CA model, so that there is coherence in CA play, which at the same time as it preserves the intellectual identity of a CA through a strong PRD, facilitates a pervasive production of high-impact knowledge, products and services, using combined insights from the three domains. For instance, while a stochastic process expert blends their research with applications in global economics, they manage this knowledge production complex carefully, to maintain core PRD expertise in stochastic processes. The point is that such an operator is far more likely to become a *Global Corporate Academic* (GCA) in these strivings, than one who dwells almost exclusively on stochastic processes.

The examples proffered here from *100 Reasons* bear this phenomenon out, for example the case of D Allan Bromley. I did mention that Professor G O S Ekhaguere FAAS is a good example of a GCA who combines his expertise in theoretical physics and financial mathematics to make original contributions to knowledge than could be argued for other academics of similar stature. He also uses an e-platform, the International Centre for Mathematics and Computer Science (ICMCS, www.icmcs.org), to conduct progressive capacity building, public intellectual and higher education-focused advocacy work.

The link between mathematical sciences and BHAGs-type problems is that the sciences provide mechanisms for exploring and solving the problems. The concept of *mechanism* should therefore be emphasized in the curricular of the mathematical sciences, Penrose (2005). Importantly, the *analogies*, *metaphors*, *what-ifs*, *assumptions* and *conditions* that enable us to appropriately develop mechanisms and assess their fittingness to reality, must be deeply explored in *intelligent conversations*, preferably based on relevant case illustrations, examples and vignettes, Ezepue & Mwitondi (2008) [**11**]. Thinking about the CA model in these lines, we are satisfied that the model facilitates this BHAG-type application of mathematical thinking. The mechanism involved could be said to be *symbolic* and *phenomenological representation* of human and academic work, not only in terms of a mathematical function (as developed in later parts of this paper), but also in terms of *qualitative description* of what the system parameters entail for different ways of attaining hyper-productivity. The model attempts to capture the realities of success in academic business as a *mathematical ensemble* of activities in three key domains of academic work – research, teaching and consulting – a complex system.

In *How did I get from here to there?* John B Fenn, Virginia Commonwealth University, USA (PhD Chemistry) asserts as follows: *'Most species of animals have developed procedures aimed at teaching its young the secrets of survival, a sine qua none of 'success'.* How well do we do this in research? Do we explore the approaches to knowledge production with our students, the nature of meaningful knowledge, and how best we succeed in all these? Is it not more the case that we often selfishly operate an *inner wheel of success*, and sometimes leave observers of our progress bewildered at our 'prodigious' rate of production of ideas, papers, products and services? The CA model attempts to unearth the basic processes which engender such *extreme productivity*. It offers *a* way to enable beginning academics and knowledge workers to understand what successful others typically do. We say *'a'* not *'the'* way because success strategies necessarily differ from player to player, but there should be some common standards that define success in *academic business*, somewhat.

Exploring such standards is a useful way to start conversations about what success looks like in knowledge work. It is possible to moor such standards to nationally approved schemes, for example the *UK Research Excellence Framework (UK REF)* which uses a committee of selected peers to review and rate the research output of UK academics, in different clusters of disciplines known as Units of Assessment (UoAs). As noted earlier, related work on the CA Model explores how it could underpin an academic's operationalization of the framework, and how it could, more usefully for developing countries in Africa, say, be extended to an *African Research and Teaching Excellence Framework (ARETEF).*

Fenn argues that the idea of having a *trade* as backup in corporate academe is advisable for a professor [**12**]. This concept is germane to the quest for career success and stability which is invariably linked to the generative capacity of an economy to produce wealth. Consider, for example, how much more wealth-creating Nigeria as a country could be if almost all academics operated such a model that enables them to maintain excellence in their core academic callings (PRDs), and combine knowledge and skills in these areas with related fields in viable research consultancy businesses (their trades). This will not only provide them alternative work to augment their earnings

from the primary academic positions, but also offer their students *deeper training* in related skills of (self) employment. For instance, I specialize in stochastic modelling and ply combined knowledge from this field, mainstream applied statistics and business analytics, and global economics, as my *trades*. Hence, the CA model declares the PAD as that emporium within which such trades are cultivated.

In another statement that reinforces the importance of a combination of theory, applications, and general cultural literacy, Fenn states: *'Strong orientation in basic and fundamental research* in the *early phase* of one's career gives a *special ability* to *think differently and* be *innovative'*. The CA model provides the *transactional tool* for expressly developing fundamental training in a PRD, as with undergraduate and postgraduate qualifications in the fields and their links to practice in a PAD, which could as well be some aspects of the PRD itself. More importantly, by doing that at the start of the higher education process, the connections between *theory* and *applications* are internalized sufficiently deeply in learners, to enhance their innovation, creativity, critical thinking and decision-making, and creative problem-solving skills (Ezepue and Ojo 2012, Ezepue 2015, 2016 Gardner 2008), *career success*, *productivity*, *employability* and *entrepreneurship*, Ezepue and Ojo (2012). For example, Ezepue (2015, 2016) examine how to use creative thinking and innovative curricula to avoid miss-educating Nigerian and African higher education students.

4. The mathematical presuppositions of the CA model

The above notes and insights inform the continuing development of the *meta-mathematics* of the CA model as follows. Here we use the expression 'meta' to emphasize that the key interests in CA work are the mental attitudes it provokes, the creative analogies, fluid conceptualisation of workable ideas in situated contexts, and the kind of *adaptive thinking* that reconfigures received knowledge to such new contexts, Ezepue and Solarin (2008). We now recall the initial thinking and conceptualization of the CA model in Ezepue (2004, 2005 and 2006).

The optimization of human and academic potential using the CA model clarifies *starting positions* from which players launch their careers and the *success pathways* that enable them to more effectively achieve significant career highs, more quickly than relatively unplanned or unstructured approaches. As mentioned in Ezepue (2004), the strategies young faculty members could use to grow professionally in their chosen areas include:

- Defining an academic focus (PRD);
- Managing time effectively and efficiently (part of project and performance management skills);
- Establishing an academic network which includes other academics in the PRD, PAD and GCL domains;
- Writing winning research grant proposals, particularly for BHAGs-style projects, not easily pulled off by traditional academics;
- Changing academic fields;
- Developing a label for oneself (an academic identity), and changing such labels easily;
- Teaching excellently using richer and combined perspectives from the three CA domains;
- Developing an innovative publishing programme; and
- Excellently straddling research, teaching and consulting aspects of the core university business.

This list is not exhaustive but covers the key areas to consider in a professional development plan. Ezepue (2005, 2006) introduce more control parameters in the 2004 CA model. The papers argue that an optimising CA player is in the business of using their technical expertise in a primary

research domain (PRD) to leverage output of both intellectual and commercial merits in related primary application domains (PADs), including teaching, consulting and research (for example writing texts and research monographs). There are unique gains in using the CA model as a thinking pad to structure an academic career, as follows.

> *'However, the key contribution of CA research as espoused in this paper is a formalisation of the mechanisms underpinning global corporate academicism, in a way that can enable the processes to be taught to others. This formalisation embodies explanatory links with creativity, innovation in learning and knowledge production, strategic intelligence, quality, impact and excellence, and performance management, which, even though they profusely characterise business education, have not been sufficiently explored in relation to how academics pursue the core university business. One can argue that these ideas are immanent in the literature of academic entrepreneurship, but in contrast to this research the mathematical presuppositions of such entrepreneurial capacities have not been explored in this particular perspective'.*

The central argument in Ezepue (2004) is that a player should be:

- Strategic in defining a common theme linking the PRD and PAD; for this we postulate a linkage parameter ρ_{ra} which measures intensity of productive links between research and application;
- Serially optimal in managing time spent on core academic activities; think of an equivalent parameter $\rho_{so} \in [0,1]$ as a measure of thermodynamic efficiencies in knowledge work;
- Determined to achieve depth, originality and quality in theoretical and applied research, teaching and consultancy;
- Optimising in the way they develop and manage a *complex programme* of publications in the PRD and PAD, including high quality journal papers, conference papers, research monographs, textbooks, consultancy reports, and course modules. An important performance indicator here is, in addition to the $d_{i,i+1}$ measure of the ability to convert current year's conference papers into full journal papers within the next year, ρ_P a measure designed to model overall effectiveness of a player's publishing programme;
- Flexible in adapting to shifting frontiers in their primary work domains; we earlier saw that the GCL function is very useful here, the richness of which we can capture in the measure ρ_{GCL} denoted ρ_G for short in the human potential optimization model considered in Ezepue (2004).

The experimental set-up for validating the claims of the CA model should map the *true positions* of players at the start and assay their *capacities* to hit different zones of performance, within a *performance space* defined by input-output activity sets from the PAD, PRD and GCL sub-domains of work. One could use ideas akin to mean value theories of quantum mechanics as an *analogy* to place players in a finite number of bands, so that each band is a *performance class* to which the players' behaviour maps them. The optimisation process is a least-energy process in which it is futile to want to obtain neat analytical solutions, since the symbolic representation only helps us to visualise the work programme as a *complex adaptive system.*

That said, I feel that the promise for a deeper 'mathematicisation' of CA play lies in adapting relevant thinking associated with models of human capital and growth, as explored in Romer (1996, pp. 128-137). This could be complemented with empirical estimation of CA model parameters as defined above or those of the Cobb-Douglas-type state equations (stated subsequently in this paper),

using a global survey of academics of different ranks and career strategies, an estimation that could exploit techniques in data science, data mining, and econometric modelling; see further notes below.

Using insights from the research to advise new faculty on career planning is simply a question of firstly mapping a player to an initial performance class, by obtaining their *psychological profile*, *interests* and success *goals*, and allowing the player to generate a work diary in a format that makes eventual *heuristic modelling* possible (Dalio 2017). Other approaches could compare the career progress of faculty members who use or do not use this schema of *meta-optimisation* (Ezepue, 2004, 2005 and 2006).

4.1 The initial framing of the state equations for CA work programme (Ezepue, 2004)

Let $WP_i(R_i, A_i, T_i, C_i)$ denote the work program for a member of faculty in year *i*. In this representation R, A, T and C are contributions from primary research, applied research, teaching and consultancy. These contributions depend on the *career strategy* and *tactics* constructed by the player via the *PRD*, *PAD* and *GCL* functions. For instance, we can express the research contribution symbolically as

$$R_i = R_i(n_r(jp, cp, rm, tb, pr), \bar{t}_r, d_r, q_r, s_r(gcl, pad, c, w, se, cpd), \rho_r(A, T, C))) \quad (1)$$

where, n_r is the number of products belonging mainly to the primary research domain, split into journal papers (jp), conference papers (cp), research monographs (rm), textbooks/book chapters (tb) and proposals for grants (pr); $\bar{t}_r$ is the vector of topics in the PRD from which the works originate; d_r is the depth of theoretical research in the PRD; q_r is an index of research quality, which we can locate in a space {h, m, l} of high, medium and low quality; s_r is the scope of research, a function of the quality of GCL (general cultural literacy), engagements in conferences, workshops, seminars, and continuing professional development in the PRD-PAD-GCL programme and related areas; and a parameter ρ_r denoting the intensity of links among research in the PRD and PAD, teaching and applied consultancy work. We create similar functions for products and research outputs in the PAD (Applied Research), teaching and consultancy as follows

$$A_i = AR_i(n_a(jp, cp, rm, tb), \bar{t}_a, d_a, q_a, s_a(gcl, pad, c, w, se, cpd), \rho_a(R, T, C))) \quad (2)$$

$$TQ_i = TQ_i(m_1, m_2, m_3, ..., m_T, q_T, s_T(gcl, pad, c, w, se, cpd), \rho_a(R, A, C))) \quad (3)$$

$$C_i = C_i(n_c, q_c, s_c(gcl, pad, c, w, se, cpd), \rho_c(R, A, T))) \quad (4)$$

Here A and AR denote applied research. In the teaching function we let teaching quality, TQ, depend on T modules in which a player participates, either wholly or as a tutor team, and use a q-variable to depict this quality. If a player works at each module such that q is 'high' for all modules, then the player scores maximally in teaching, up to a maximum possible weight allocated to teaching. Currently in most institutions, more weight is allocated to research and income generation from research and consultancy than to teaching. For each role, the *scope function* aligns the *cpd* component to activities related to that role. The *intensity parameters* model how actively the player blends a function with insights, cases and perspectives from the other functions. A good starting point is to

link teaching, applications and consultancy to research. For instance, designing undergraduate and graduate course work assignments, group work and dissertations around topics in an integrated research theme is advisable.

A good *cpd* activity for promoting *teaching quality* is to engage in university-sponsored postgraduate certificate for teaching and learning in higher education. This course is usually a one-year intensive course offered to faculty members who are new to teaching. But it is a rich source of teaching, learning and assessment skills for all faculty members. Such a course exposes participating faculty to principles of curriculum design, theories of learning, ways to encourage deep learning, as opposed to surface learning in students, key professional skills, and issues in independent self-directed learning. Similar *cpd* programmes exist for *research supervision* in which aspiring graduate supervisors are drilled in the art of research supervision. These in-house courses should be blended with other workshops on writing successful research grant applications, structuring research collaborations, networking, third-stream income generation and academic publishing. Opportunities should be seized in conferences and workshops to *network* with international colleagues in the PRD and PAD fields in which a faculty member works. The above functions set up the following optimisation programme

$$Max_{(i,e)} F_S(WP_i(R_i, A_i, T_i, C_i); f_m, dc_{i,i+1}, f_{GLC})) \tag{5}$$

subject to resource constraints and deadlines on developing and refreshing teaching modules, attending conferences, maintaining cutting-edge research and continuing professional development. The parameters f_m and f_{GLC} are *fudge factors* for flexibility in adapting to changing emphases in research and academic fields, and the parameter $dc_{i,i+1}$ is a design construct for rolling the work programme over to the next year. We can scale these fudge factors on a 0-1 intensity scale. For example, a beginning academic typically builds experience through conference papers and interim research reports. Those who convert this year's conference papers and research reports to full journal papers by the following year at most (assuming a one-year workflow accounting period) will have a $dc_{i,i+1}$ value nearer to 1, and 0 if the conference papers are not developed into journal papers. Intermediate values in the range can be assigned by looking at achievement records. Similarly, a player who serially optimises workflow to a high degree is assigned a high f_m value. Also, a player who maintains an intense GCL work ethic, defined appropriately, will have a f_{GCL} value near to 1.

Clearly, this is an intrinsically complex system because of the large number of *variables*, *attributes*and *success measures* to model. It is also extrinsically complex in the sense that the player competes with so many other players who submit papers to similar journals, aspire to the same ranks, and manipulate similarly complex intrinsic systems. The suffixes i, e attached to the maximisation operator denote the fact that the optimisation is both *intrinsic* on the thinking and operational tactics and *extrinsic* on the 'hard' output. Indeed, these model specifications become more meaningful when you consider that in operationalizing the UK REF earlier mentioned, a CA player faces extrinsic complexity due to competition with other 'REFerable' academics who are submitted in the same Unit of Assessment (UoA). The 'hard' output is measured as a score function F_S on the work programme.

The beauty of the CA model captured in these equations is the holistic emphasis on all-round excellence in research and teaching and its capacity to induce mutual reinforcements between the two in academic performance. This need is now recognised in the UK when in 2016 it created an

equivalent Teaching Excellence Framework (TEF). Even with this, the CA model prompts the 'unification' of the two into a Global Research-Teaching Excellence Framework (GLORETEF), and its adaption to Africa in form of an ARETEF, a milestone that the different frameworks in the UK still fall short of.

4.2 A case study which does not necessarily say it all

This case study enables us to understand the CA model better and the roles of model parameters in guiding a player towards programme optimality. The case study uses a work diary to generate performance data; a three-month work diary was kept by the case player. The diary contents were used to instantiate the model by providing initial estimates of control parameters and other performance data. The initial thinking uses a single player's diary experience as proxy for a full-cohort experience. The results inform the design of a *systemic survey* of corporate-academic behaviour across many disciplinary clusters in future work on the model. The version of the model presented here is the *strong form* which is primarily a beginner's model. For an old player's version, we can bypass the pathway from conference to journal papers by assigning the year-to-year parameter a small enough value, since mature academics would more quickly submit conference papers to journals.

For the case study, a true starting position could be the starting publications profile of the staff involved, for example a vector $\bar{p}_0 = (2jp, 2cp, 1dt, 4m)$. In this representation *jp* stands for journal papers, *cp* conference papers, *dt*doctoral theses and *m* modules taught at both undergraduate and postgraduate levels. The origin 0 represents year of appointment. This is not the only way to initialise the intrinsic optimisation process. The reason for adopting this finer *granularity in measurement* is that it makes a difference when conference papers are readily converted into journal papers and when not.

This simple CA representation is a bit primitive for now, since it has not fully accommodated all key dimensions of complexity in the CA model. For instance, it only gives hard output measures that go into the score function F_s associated with the CA work programme. Consequently, it captures the key levels of performance related to *extrinsic optimisation* of the work programme, but we are interested in *eclectic performance modelling* of the work programme, which emphasises the *intrinsic optimisation* happening in the mind of a CA player. For this, we must account for *motivation levels*, *coherence* or *decoherence* in a player's strategic and tactical planning, and the flexibility to adapt to changing circumstances, for example (Smither, 1994). A graphic illustration of the career dynamics sketched above is as in Figure 4.1 below. Ezepue (2006) discusses systematic studies that provide analogies of the CA model. This paper reinforces the evidence base from the analogies and case study work, with *career scripts* from proven CA players in mathematical sciences.

If figure 4.1 does not say it all, what more remains to be seen?

There is so much more to be said about the CA model dynamics .First, we discuss briefly the type of macroeconomic equations of state which capture CA play in mathematical terms. We follow this up with a discussion of the transactional mature of the CA model revealed by figures 4.1 and 4.2.

Somewhat related to the CA parameters mentioned above, the nature of *'explosion'* or *nonlinearities* in the knowledge production potential of a CA is akin to the quadratic explosion in Einstein's equation for energy given by $E = mc^2$, where E stands for energy released by mass m of an object, and c is the velocity of light (180,000m/s), which being very large produces an infinitely large energy. Reasoning analogically in the case of CA play, we are looking for an equation that explains this kind of hyper-productivity. It needs to

incorporate the time element t over which CAs produce value, and additional parameters that scale up the productivities over time. A family of models in industrial economics that exhibit such growth behaviours are the Cobb-Douglas production functions discussed, as we noted earlier, in Romer (1996).

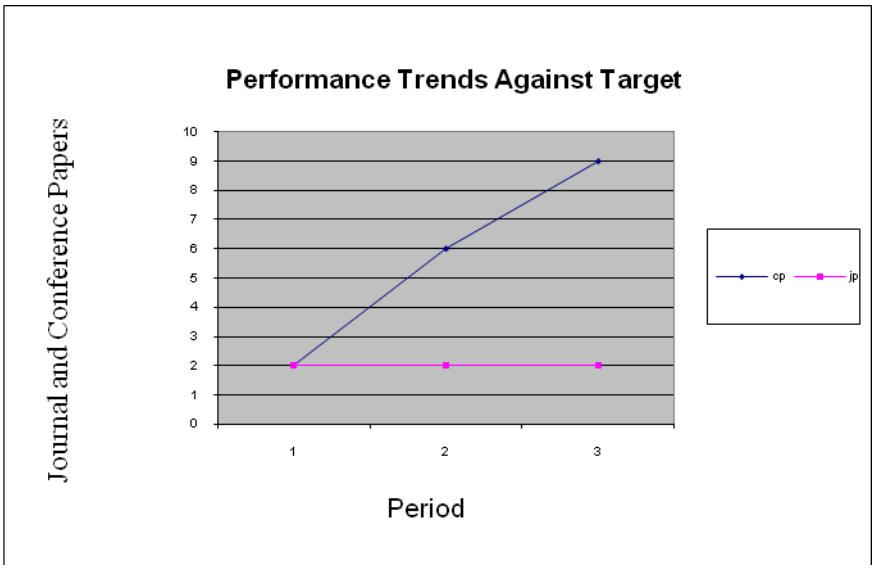

Figure 4.1. CA performance trend

A simple idealization of such a model is as follows:

$$Y(t) = K(t)^{\alpha} H(t)^{\beta} [A(t)L(t)]^{1-\alpha-\beta} + \varepsilon_t ; \alpha, \beta > 0,\ \alpha + \beta < 1,$$

where K is capital, A human capital per worker, H is the stock of human capital, L the number of workers, ε_t is random error, such that a 'skilled worker supplies 1 unit of L and some amount of H (Romer 1996, p. 128). This is the basis of the Cobb-Douglas production function which, with suitable assumptions on the behaviours of the K, H, A and L functionals and their derivatives which measure production rates over time, facilitate the creative use of such models in other contexts such as this work. It can be sensed that these functionals may connect the basic CA parameters in ways like:

$$Z(t) = \rho(qt)^{\gamma} + \varepsilon_t \ 0 < \rho < 1,\ q, t > 0.$$

We remark that the error term in the models reflects the non-deterministic nature of these relationships, since the models deal with human productivity which is subject to variation. In other words, the models are stochastic, with the original trend components in the macroeconomic formulation at the core (Massy et al. 1970).

Hence, we need to find a meaningful connection amongst the CA *measurements* and model specifications that define personal, research team and national macroeconomic production of knowledge by CAs. Thinking at these different levels provides an opportunity to theoretically explore the differences and common grounds between *individuated production* and *firm-economy-wide* production, not yet examined in the literature, to our knowledge. For instance, what are the proxies for the K, H, A and L functionals in CA play at individual, research team, overall university, and national levels? Can we meaningfully assume that L stands for number of PhD students, post-docs and collaborators who co-produce value with a CA? These considerations enable us to engage in the

kind of *thought experiments* that theoretical physicists use to refine ideas, as was the case with Einstein's theory of relativity (Penrose 2005).

A triangulated approach to the modelling will use a global survey of academics of different persuasions to provide a robustly huge evidence base for discovering what types of CA state equations typify CA hyper-performance in different clusters of disciplines, and for what class of CA players. This is a matter for PhD research which requires a detailed understanding of measurement theory and practice (Hand 2005), and the statistical techniques of data science and data mining. We suggest indicative titles for such PhD research below, and in the PhD Research section of the Afrihero website (www.afrihero.org.uk): **a)**The Dynamics and Empirics of CA Model-Based Knowledge Management in High-Performance Organisations; **b)**Data Mining and Model-Based Performance Management in Knowledge-Intensive Careers; **c)** Heuristics, Software Engineering and Model-Based Performance in Knowledge-Intensive Careers; and **d)** Model-Based Performance and Career-Self Management in Knowledge-Intensive Work Environments.

5. Visualising the economics of CA model versus traditional academic work performance

We schematise in Figure 4.2 the relative affordances of productivity by CA versus traditional model of academic work. This comparison is idealised to capture the essential differences in the two approaches. It does not suggest that the performance figures used necessarily obtain in all career situations. The key insights from the figure are as follows. Most career histories typically resemble elongated S curves which mimic the life-cycle of a firm – early growth, short period of increasing returns, decreasing returns up and till a performance ceiling, and a decline.

Suppose that a typical academic: achieves, say, 100 units of output measured appropriately and commensurately for all academics (for example by a common measuring rod that combines all forms of academic output that go into the promotion process); attains a professorship as an ultimate career high. In industry, this rank may be replaced by CEO, MD or Executive Chairman, for example. The academic literally lives out their career on this merciless S curve, based on their ability to ply the single-discipline knowledge base represented by a strong PRD. If the academic is more creative than his disciplinary colleagues of similar potential (*performance class*), they may use a fortuitous change in field of specialization to eke out, say, a d1 career longevity that takes them to a slightly higher productivity mark of 110 units, if we extrapolate accordingly on the graph. The acme of this traditional academic career which is VC-ship of a university may require a total of t_{VC} years to attain, where d2 is the additional waiting time to actualize this dream beyond the t(Professor) years it takes to become a Professor. Suppose that this additional time yields an additional 10 units of productivity overall to hit the 120 units mark. This is assuming that the Professorship is still on a rising productivity path represented by the second green curve which rejuvenates the ordinary S curve of the non-VC Professor.

Suppose in general that these ranks and attainments yield, respectively, total annual remunerations of £70,000 and £200,000 for the traditional Professor and VC. The huge difference here is deliberately chosen to reflect the equally huge 'externalities' associated with VC-ship. We reiterate the fact that these figures are merely indicative of what could happen, since a hardworking Professor in a lucrative field such as marketing may make up to £100000 annually and even more. For example, the likes of Michael Porter, Professor of Marketing in the US, easily make some $1m for developing national innovation systems for work completed within, say, three months.

Now imagine that a CA, more meaningfully a Global Corporate Academic (GCA), is willing to plough in a relatively longer 'delayed gratification' effort of duration dg = t3-t1 beyond the attainment period of a traditional professorship. Other durations are interpreted similarly.This

amount to some 1000 units (efficiency ratio 10:1 compared to a traditional professor). This is not impossible if you recall Professor Alan Bromley's 500 publications as a Global Corporate Academic (GCA). This exponential leap in performance (making the GCA literally worth ten professors in nominal productivity terms) is associated with a disproportionately exponential financial performance of £5m annually (this time making the GCA worth financially about seventy times a traditional Professor, if you work out a ratio of £5m:£120000 = 71:1 approximately). In other words, there is such a huge increase of g(CA-Pr) and g(CA-VC) of £4,930,000 and £4,800,000 respectively, between a GCA's earnings and that of a Professor or VC, that the figures are not shown to scale as indicated on the right-hand side financial performance scale.

In a sense, the GCA seems to be able to more seamlessly change fields because of the rich vein of creativity and innovation afforded by combinations of ideas in three domains (PRD, PAD and GCL). This enables them to maintain a *sustainably exponential* productivity curve which is a (lower or upper) *career envelope* of a series of superimposed S curves, caught midstream on their growth (rejuvenated parts) and spurting out of each other successively. This illustrates the phenomenon of nonlinearities (increasing returns or hits) typically described in the mathematics of complex systems, including related concepts of criticality, wisdom of crowds and simulation of such systems (Ezepue and Solarin 2004, 2009; Ball 2004; Gladwell 2005; Farrell 1998; Surowiecki 2005; and Casti 1997). This nonlinearity is a key attraction of CA modelling in this paper.

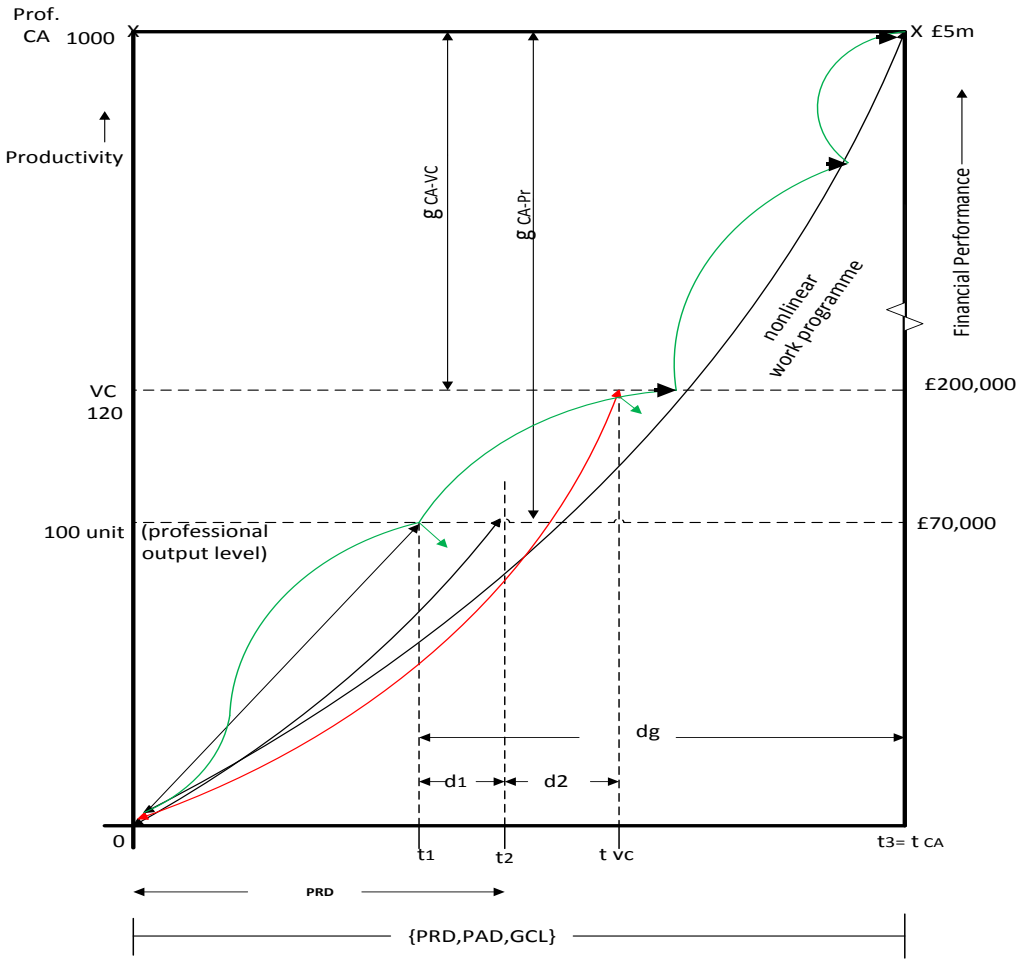

Figure 4.2 Visual comparisons of CA versus Traditional Academic performance

The link between CA thinking and wisdom of crowds is the fact that the wider network of collaborations which the connections amongst the ideas in the three CA domains engender creates a wisdom-of-crowd effect in the CA's work programme. In effect, the CA has more capacity to work

with far many more people, PhD students, collaborators within a structured consortium of proposal writers and research investigators, than a traditional CA. It is also this mass-action effect that links CA productivity with criticality and complexity.

5.1 The transactional nature of the CA model

We now use the figures 4.1 and 4.2 above to elucidate the *transactional nature* of the CA model and its capacity to prompt *reflexive thinking* about career opportunities. A CA player can use such visualizations of career success to interrogate their performances along many key performance indicators (KPIs). For example, only two such indicators are shown for simplicity in Figure 4.1 – numbers of journal and conference papers produced in a year. The reader can see that the number of journal papers at the start is flat while that of conference papers is steeply rising. The CA player thus recognizes that action must be instituted to convert the conference papers to high-impact journal papers.

In a more realistic visualization of the work effort, we can juxtapose a richer variety of indicators carefully targeted in the model to cover key aspects of a stellar academic career, for example quality of stakeholder services (including lecture notes and teaching styles, with students conceived as internal stakeholders), as depicted in the state equations which define the model. This richer picture of the work effort is attempted in current work towards enhancing the CA model to accommodate cogent KPIs implied by the UK Research Excellence Framework (UK REF), the UK Teaching Excellence Framework (UK TEF) and World University Ranking, researched and published by *Times Higher Education*. We combine ideas from these sources with insights from the CA model and 3E-focused higher education innovations to develop the Global Research and Teaching Excellence Framework (GLORETEF), including the African version (ARETEF).

A good approach to the 'rich picture' would be to indicate in Figure 4.1 estimates of all the intensity parameters associated with the model, for example those for citations, PG supervision, ambition, happiness and networking, as well as the year-to-year changes in the parameters. For example, seeing that in a previous year a CA player's intensity of *useful networking* was 0.40 (40%) compared to 0.15 (15%) the year before shows a remarkable improvement. Tracking the changes in these parameters (in this case 25%) reveals the force of improvement in that aspect of the academic business. Similarly, to Figure 4.1, Figure 4.2 in the manner already described shows the advantages that accrue to the CA player compared to traditional academics. This motivates CAs to stick to their knitting and succeed phenomenally.

We can see that getting the promotion ideals in African higher educational institutions to mirror this sense of overall quality and balance in all types of academic activities foreshowed by the CA model, would help to avoid such situations whereby some academics could sweat the PRD activities on their way to a professorship at the expense of teaching quality, because of the current over-emphasis on research output in academic career success. The transactional nature of the model facilitates *extended intuition* around the work flow via *richer metrication* as discussed here. It also provokes success metaphors and analogies drawn from similar high- performance fields, for example sports, banking, and executive management. Again, the model enables a player to craft intelligent and value-seeking collaborative networks with other players in the three domains.

5.2 Metaphors for the CA work ethic from Theoretical Physics

We compare work in CA modelling to some 21st century challenges in the sciences related to Theoretical Physics. In the Saturday March 21, 2015 article in *The Times UK* newspaper, entitled:

Cern Collider Set to Settle Biggest Dispute in Physics, see p.33 of the paper, the author Tom Whipple, describes the challenge to verify the susy (Supersymmetry) hypothesis as the biggest dispute in physics. According to the article:

'Supersymmetry is generally regarded as a beautiful and potentially very useful theory. At present, particle physics is described by something called the Standard Model – a descriptive edifice that was completed by the discovery of the Higgs boson and explains much of the subatomic world. It is considered a towering achievement, but it has problems – among them that it relies on some apparently arbitrary assumptions about the nature of the Universe, it says nothing about dark matter. Oh, and it predicts we shouldn't be here'.

Other core constructs that appertain to this paper include: **a)** having Cern (Centre for Research in Nuclear Physics) as an European particle physics laboratory based on the Large Hadron Collider, which in '27 kilometres of tunnels beneath the Alps' shoots trillions of particles from Switzerland to France and back again 10,000 times a second, before they smash together, and - with luck- produce new particles, the ultimate question here being whether these particles are supersymmetric; and **b)** the possibility that by introducing new particles with similar properties to existing particles, but with different 'spins', the problems of the Standard Model could be removed.

Reasoning analogically from this story, CA model stands in the same relation to Traditional Model of academic work as Susy does to the Standard Model of Theoretical Physics, except that the knowledge domain of interest is corporate-academic performance of university lecturers. Analogous to the problems from the Standard Model is the fact that the Traditional Model predisposes academics mainly to generate knowledge that is theory-biased, and stays primarily within the ivory tower and its usual dissemination channels. In effect, the CA model resolves some limiting myths in the Traditional Model, whereby academics typically underutilise HEI-industry-government linkages, by not being conversant with how to directly implement research ideas in a way that benefits wider stakeholders in this Triple Helix of systems. Hence, as we pursue CA research, we consider the different 'career spins' that the model generates, based on how academics with different psychological make-ups and from different disciplines execute the model.

An equivalent real-world laboratory to Cern laboratory for continually refining the model results and their career implications, is aCA High-Impact Human Performance Innovation Lab (CA Laboratory for short). This laboratory is precisely Worldhero 3E (www.oseluxworldhero3e.com), particularly work in the Schools of Business Analytics, which pools multidisciplinary insights from mathematical modelling, finance, statistics, economics, marketing, complexity theory, performance management, knowledge management, psychology and sociology, for example, to develop results that guide academics on how to use the model effectively. For this reason disciplinary research in Worldhero 3E is organised in Research and Enterprise Development Schools.

These model entailments will be reflected in related CA technologies and enterprises mentioned in this text, and innovative graduate courses such as MSc in Applied Statistics and Research (which will mix perspectives from core statistical courses and the CARESS-informed advanced research methods and software training), MSc/PhD in Applied Data Science, and CA model-driven MSc/PhD in Model-Based Human Development.

6. Typical public intellectual works provoked by CA thinking

A related story in the UK Independent on Sunday paper (22 March 2015, p. 28) entitled 'Hybrid Rocket Car Aims to Be Fastest on Earth'(by Tom Pilston)

This story talks about a **£40m** supersonic car built to achieve a ground-breaking speed of 800mph in 2016 and up to 1000mph beyond this date, and hit these speed limits in about 55 seconds. The more interesting details in the story are the Big Hilarious and Ambitious Goals (BHAGs) it excites,

namely **a)** 'inspiring the next generation of engineers, scientists and mathematicians'; **b)** mainly by visiting **6000** schools, providing learning materials, running a model rocket car competition, and reaching therefore **8.5 million** children by 2018. In the Worldhero 3E ecosystem of ideas,the different research and enterprise development schools and related global businesses will pursue such scales of wider societal impact in developing modern academics, students and professionals. These impacts will be pursued through virally marketed superbooks, research monographs, skills development manuals, seminars, workshops, conferences, symposia, internships and one-to-one mentorship and coaching. For more insights on these initiatives, see related offerings in the School of Global Business in Worldhero 3E (www.oseluxworldhero3e.com). Particularly also, related 3E Academies such as the Skills for Students Graduates and Start-Ups (SSGS) will target such large-scale outreach through summer schools and other capacity building events.

In the same vein, we convened the Nigerian Mathematics Finance Statistics and Economics Research Consortium (NIMFSERC, www.afrihero.org.uk) around 2008,with support from a seed grant I secured from the British Council and collaboration with the NMC under the directorship of Professor Solarin. The purpose was to mobilise inter-university collaborations on high-impact research and applications by academics and professionals in these fields. This will enable academics to become more aware of the challenging problems in the banking and finance and national economic management spheres, and address their research to resolving those problems.

The NIMFSERC worked with the International Centre for Mathematical and Computing Sciences (ICMCS, www.icmcs.org), led by Professor Ekhaguere *FAAS*, to organise in 2014 the first knowledge exchange visit to the Nigerian Stock Exchange (NSE), by academics and PhD students from Statistics Information and Financial Mathematics (SIMFIM) Research Group, Sheffield Hallam University, UK, led by the author, and those from the Mathematics and Statistics departments of the University of Ibadan (UI), led by Professor Ekhaguere, *FAAS*. This one-day visit exposed all to the key research areas in mathematical and statistical finance which the NSE expects academics to explore. It was followed up by a one-day research workshop among these collaborating units at the Mathematics-Statistics Complex of UI. In 2015, the ideas in this workshop were expanded upon in the *First International Symposium on Mathematical and Statistical Finance with Emphasis on Financial Markets, Bank Financial Management, and Economic Development*, 1-3 September 2015, UI. The Symposium Proceedings was co-edited by Professor Ekhaguere and I,and published under the imprints of the Publications of Worldhero 3E-ICMCS Research Consortium (Ezepue & Ekahguere 2016). We plan to hold this event annually in different Nigerian universities and internationally in UK, US and Middle East, for example. To strengthen such consortia continentally and globally, we have instituted in the Worldhero 3E School of Global Economics, a global Centre for Mathematical Modelling in Finance Economics Insurance Banking and Business (CEMMFEIBB, www.oseluxworldhero3e.com). This online centre will pool related expertise in the different subject areas studied in global economics from all universities and industry sectors that apply the emerging research results. You can imagine how much more innovative PhD students jointly supervised by such pool of experts could be, compared to those produced by single supervisors without such support networks in traditional academia.

Furthermore, think about the BHAGs-style nature and scale of doctoral research that the NIMFSERC and CEMMFIEBB platforms will support with online resourcing and collaboration led by the3E Global Economics programme. One of such BHAGs-style research programmes is currently structured with a focus on Systematic Stock Market Characterisation and Development (SSMCD) research, investing and advisory services. The SSMCD is the main research theme to which my PhD students' research topics belong. It requires hundreds of PhD and post-doctoral researchers to be recruited and jointly supervised with collaborating experts in selected Nigerian,

African and global universities, through specially structured Doctoral Training Centres (DTCs) in the core research themes.

A DTC is different from a traditional departmental PhD research supervision programme, because the latter is handicapped by a number of malaises, chief among which are: **a)** there is usually only one supervisor with risks of delays in graduating the students; **b)** inability of the topic to sufficiently focus on big hilariously ambitious goals (BHAGs) and therefore effectively support innovative enterprise development characteristic of CA model-based Worldhero 3E research, for example for-profit and social enterprise firms and charities); **c)** lack of innate capacity to get the students to actually network regularly with academics, experts, and fellow research students, except when they attend conferences and workshops; and **d)** a sense of being cut-off from international linkages for fresh ideas, within and beyond the research.

Hence, DTCs are structured such that: **a)** there are at least two supervisors in the hosting university, one of which may be from a collaborating 3E affiliate university which also supports the DTC studentships in the same topic area; **b)** there are annual 3E, CEMMFIEBB or NIMFSERC consortium-led conferences organised to help students come together with industry experts and exchange ideas; an example is the mathematical and statistical finance symposium; **c)** the annual conferences, symposia and workshops also generate proceedings, textbooks and/or research monographs at the cutting-edge of knowledge in the areas; **d)** by belonging to these 3E-ICMCS Innovation Grids, there are also joint University-Industry-Government Summits, Research Partnerships, Knowledge Exchanges, and North-South Academic Research Visits, which dedicated PhD supervisors co-lead with expert scholars in Nigeria and internationally; **e)** importantly, the students and staff learn how to collaborate within their own structured researchgroups listed above; **f)** other affordances include the **joint writing** of BHAGs-style research proposals which will fund the studentships; and **g)international scholars** from partner universities in UK, US and other countries will be involved in the supervision and knowledge exchanges, in the most trail-blazingHE Research and Learning Innovation System in the world, with connecting DTCs in Mathematical Sciences, Business, Economics and Finance, Social Sciences, Health and Biological Sciences, for example.By working with proprietary CA-3E Learning Technologies described in this paper-text**,** we provide the enabling frameworks that support these innovations and related capacity building interventions; see the 3E School of Information and Technology Management, www.oseluxworldhero3e.com,.

In 3E-ICMCS Publishing, we also identify many malaises which must be addressed. These include: **a)** the fact that the **publish-or-perish** emphasis on publishing in international journals implies a continual erosion of quality in equally good Nigerian and African journals; **b)** eventually some academics publish in low-quality Global Journals, sometimes established in India, with quick turn-around of acceptances, which is ironical; **c)** useful work that should typically catalyse Africa's and developing countries' socio-economic development are not published within the continent for easier access to end-users; **d)** for textbooks and research monographs, there is an imbalance in the choice of case studies and examples, with available foreign-authored texts dominated by international materials; **e)** academics may not be properly trained on the **art-science** of formulating highly innovative graduate research topics, such as achieved by using the CARESS ©, and how to turn these into best-selling research monographs using STELLARTEXT © system; **f)** even when some are good authors, they are not enabled to come together to form **author syndicates** who can be trained specially in the CARESS© and STELLARTEXT© systems, to take on ambitious projects of developing highly innovative (theory-practice laden) textbooks, which not only cover indicated remits in the NUC Minimum Academic Standards, but also deliver related entrepreneurship, enterprise development, and employability (3E) skills; **g)** there are no journals that specifically fill

the need for papers (be them reasonably longer) which develop in sufficient detail a technical theme, with enough emphasis on the theoretical findings as well as how they relate to practice, the sort of practice that tackles challenging national and global problems; and **h)** the foreign-authored texts are too pricey for students from developing countries.

3E Publishing tackles these gaps head-on by, for example, instituting innovative journals (to be fully operational in 2018) in all disciplines clustered within 3E Research and Enterprise Schools. Amongst the additional novelties in Worldhero Journal Publishing are: **a)** use of a balanced panel of leading international and home-based academic and professional reviewers to ensure that the papers meet the theory-practice demands, in addition to other criteria of quality and excellence; **b)** double-blind reviews; **c)** use of an additional crowd-editing process, whereby papers are sometimes crowd-rated by a large database of direct end-users of the stated research results, for their relevance in the marketplace of ideas; and **d)** continual release of Special Editions of the journals on specially-convened themes, linked to critical examination of the pool of ideas in proceedings of related conferences, summits, and workshops. For instance, best papers in the proceedings are published in the journals if an author enhances their papers to meet the seven stiff criteria of excellence that underpin the journals. These criteria exceed the three or four criteria used in most traditional journals. We train would-be authors on how best to meet such criteria in the annual face-to-face events we organise internationally within different 3E regions – Africa, Middle East, Asia, India, China, The Americas, USA and Europe.

For more vigorous translation of emerging research results to practice within key regions of the world, we founded the Society for Advancement of African Higher Education and Research (SAAHER), www.afrihero.org.uk. This is a form of HELinks that galvanises perspectives and interventions across key stakeholders in higher education, namely academics, students, graduates, professionals, management of higher educational institutions, consultants, entrepreneurs, key industry sectors, and policy makers, at local government, state government, national, continental and global levels. This society is globalised in Worldhero 3E in form of an online Society for the Advancement of World Higher Education and Research (SAWHER), with regional variations across Africa, Middle East, Europe, Asia, China, India, US and the Americas. See further notes in the School of 3E Education in Worldhero 3E website, www.oseluxworldhero3e.com.

7. Discussions linking the CA model to knowledge management

In this section, we link the CA model to key constructs in *knowledge management* (KM) and explore further its potential uses in *academic entrepreneurship* and *capacity building* for *economic development* of Nigeria, Sub-Sahara Africa and developing countries generally. The literature on knowledge management is huge and still growing, so we select a few references that capture the key constructs and theoretical developments in this emerging field. We show in the brief discussion of these ideas that the CA model is a framework for enacting knowledge management at individual staff levels in an organization. We reserve a fuller critical discussion of the theoretical contributions of CA thinking to KM for a separate paper.

The key constructs underpinning KM include: the creation of *insights*, *experiences*, *processes* and *practices* that add value to organizations and societies (Alavi & Leidner, 1999); a focus on technologies that facilitate knowledge sharing and interactions among people; and signification of their identities and overall work environments as a complex adaptive system. Hence, irrespective of theoretical persuasions, key dimensions of KM include the building of communities of practice (Wenger et al. 2001), corresponding *social networks*, intellectual property (Bontis & Choo 2002), information theory, complexity science, and construction of new knowledge.

Other interests in KM distinguish between *tacit* (internalised) knowledge and *explicit* (externalized) knowledge which is easy to share with others, embedded (within-system) and embodied (intrapersonal) knowledge, and exploratory *creation* of new knowledge versus *transfer* of existing knowledge (Alavi & Leidner, 2001; Serenko & Bontis, 2004). The literature on KM including the ones listed above concern organizational knowledge management frameworks and issues, and only mention in passing individual knowledge making and management. It is almost as if the formal training acquired by individuals provides the entire wherewithal for making them active creators and managers of knowledge, so what matters is how the organizations agglomerate, disperse and use the totality of knowledge which the members contribute. But the most difficult part of knowledge management is getting individuals to master how to generate that knowledge in the first place, as distinct from formal training. That is, getting individuals to imbibe relevant tacit or embodied knowledge.

> *Hence, a key contribution of CA model-based KM is that it expands the repertoire of meanings, operations, applications, and stakeholder opportunities around which individual knowledge workers perform their knowledge building tasks. By generating this bottom-up innovation and knowledge ideas, it can be shown to resolve most of the theoretical contradictions that are associated with traditional top-down KM models as explored in McAdam & McCreedy (1999), but not discussed further in this paper. In other words, CA model-based KM can be critically argued to offer the most unifying framework for KM across all main knowledge carriers (individuals, groups, organizations, and inter-organizational domains), so long as the root carriers (individuals) operate the same CA model across all these domains.*

Virtually any other dimension of KM can be shown to follow from the CA model, if it is appropriately operationalized. As noted above, a suitable PhD research topic that will explore these facets of ideas further is something like: *The Dynamics and Empirics of CA Model-Based Knowledge Management in High-Performance Organisations.*

8. Further affordances of the CA model

The novelty of CA research is that whilst some form of academic mentorship clearly happens in higher educational institutions, the approach is rather informal and does not use a *transactional model* that connects all aspects of the diverse range of activities that academics undertake in modern university settings. For example, PhD supervision of young academics focuses on getting them to acquire the PhD, not necessarily to excel in all the activity domains which the CA model talks to. Therefore, using the model as a basis for formal training of people in knowledge work is especially important in developing countries, since CA players learn the skills requisite in fast creation of wealth in those economies.

The model resolves the *paradox* of single discipline focus in academic careers in favour of a managed cross- or multi-disciplinary approach, which is structured around the PRD, PAD and GCL domains. The gains from using the model to manage a career include: the ability of academics to multi-task key wealth-creating activities at an early stage in their careers; to be *continually productive* by exploiting the *interactions* among the domains; getting their learning and teaching, if based on a CA model-driven curriculum, to talk to societal needs as they blend *deep theory* with *deep practice* (Ezepue and Ojo 2012); hence, enabling a *locust effect* in socio-economic development of a country to happen, through the intellectual efforts of so many graduates who imbibe entrepreneurial skills innate to the model, and just like locusts 'swarm' the national development challenges for workable solutions.

The fact that the model expressly motivates CA players to see their academic work in literally business terms and hence use business modelling, strategic planning and excellence frameworks, such as the Balanced Scorecard to create success plans, is simple but revolutionary (Ezepue, 2005, 2006). This is because people usually do not apply as much rigour in managing a formal organization as in their personal life-worlds. Hence, CA players rigorously create and maintain *academic identity* in balanced PRD-PAD specialist areas of work, sharpen their *attitudes* and *productivities*, exploit domain interactions with affordances of *nonlinearities* and *increasing returns* on academic effort, and skilfully professionalize academic knowledge through effective creation of products and services (*CA artefacts*) of interest to society.

9. Summary and conclusion

In this paper, we substantiated the complex CA model explored in Ezepue (2004, 2005 and 2006) with direct evidence from the life-worlds of selected global mathematical scientists, thereby ensuring its relevance in career planning. We saw that mathematical modelling, if carefully conceived, can reach seemingly nebulous aspects of the human condition. The benefit of this exercise is more crucially an illustration of original mathematical reasoning as applied to topics that are strategically vital to the socio-economic development needs of a nation, especially developing countries such as Nigeria. Such benefits were further examined in the links between the CA model and knowledge management.

The paper demonstrated the fact that a model-based approach to knowledge work can transform the productivities of staff in high-performance organizations, hence helping to *'reposition Africa in the global economy'*. The model is universal in construction and application so that different *knowledge workers* benefit from its affordances, for example researchers, practitioners, private and public institutions, and governments seeking to enhance performance in different career settings.

Using the numbered items in square brackets [**x**] in the initial description of the empirical evidence of CA behaviours from the text *'100 Reasons …'* as *learning hooks*, the paper for the first time subjected the work practices of selected global scientists from the text to a thematic analysis of how they achieved *phenomenal success*. The results are summarised thus:

[**1**] Some lines of academic research may fail to be productive in the future;

[**2**] Highly successful academics tend to use an army of PhD students and research collaborators to boost their productivities;

[**3**] There is a need to find fertile and possibly niche research areas which constitute a vortex of creativity by combining related (sub) fields;

[**4**] Globally-leading academics have a voracious capacity to assimilate diverse knowledge and creatively solve problems;

[**5**] There is a seemingly strange range of GCL activities accommodated by the work programmes of Global Corporate Academics (GCAs), for example literature, molecular biology, philosophy, politics, economics, psychology and sociology;

[**6**] There is useful emphasis in some cases on producing important technologies;

[**7**] There is also an emphasis on achieving significant societal and/or profound scientific impact of a discovery;

[**8**] There is a hint on the need to do science with/and technology;

[**9**] GCAs manifest an uncanny ability to change research fields when needed;

[**10**] The text reveals the need for academics to understand the *hot* versus *non-hot* typology of research;

[11] Hence, academics should be aware of the preconditions, mechanisms, analogical reasoning, and success metaphors that underpin the formulation of such ambitious projects, based also on extension of *strong-form* models to other contexts; and

[12] Importantly, there is a need for academics to have a [PAD-mediated] trade alongside their PRD in doing corporate academic work.

The paper identified related PhD research topics as follows:

- Emerging Trends and Influences in the Pedagogy of Different Disciplines: Perspectives from Entrepreneurship, Enterprise Development and Employability;
- The Dynamics and Empirics of CA Model-Based Knowledge Management in High-Performance Organisations;
- Data Mining and Model-Based Performance Management in High Knowledge Intensive Careers;
- Heuristics, Software Engineering and Model-Based Performance in High Knowledge Intensive Careers; and
- Model-Based Performance and Career-Self Management in Knowledge Intensive Work Environments?

In a sense, the paper provoked a feeling of a Great Deception in modern academia, since the hundred scientists seemed to balance specialisation with scholastic breadth suggested by the CA model, but this work ethic is not prevalent in traditional universities, especially Nigerian universities. In honour of Professor G O S Ekhaguere *FAAS*, whose career fits the CA archetype rather well, I conclude this paper with a quote that attests to the nature of ambitious goal-setting and achievement which he represents.

On goals

'I believe that a focused execution of the insights provided by the Corporate-Academic (CA) model explored in this paper: expands our career possibilities and goals; stiffens our determination to achieve them; demystifies the difficulties in doing so; directs our gaze to the stars as the limits of our potential; maintains our creative momentum in realizing it; and makes us sufficiently contrarian and extremely successful in our approach to actualizing our career dreams.'

– Patrick Oseloka Anachuna EZEPUE (the author)

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