



REVIEW

Lifelong learning: Established concepts and evolving values



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KEYWORDS

Biographicity;
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Exigencies of life

ABBREVIATIONS

LL, lifelong learning;
LAL, learning across
the lifespan;
CME, continuing
medical education;
CPD, continuing pro-
fessional development

Abstract Objective: To summarise the concepts critical for understanding the content and value of lifelong learning (LL).

Methods: Ideas generated by personal experience were combined with those of philosophers, social scientists, educational institutions, governments and UNESCO, to facilitate an understanding of the importance of the basic concepts of LL.

Results: Autopoietic, continuous, self-determined, informal, vicarious, biographical, lifelong reflexive learning, from and for society, when supported by self-chosen formal courses, can build capacities and portable skills that allow useful responses to challenges and society's new structures of governance. The need for LL is driven by challenges. LL flows continuously in pursuit of one agenda, which could either be citizenship, as is conventional, or as this article proposes, health. LL cannot be wholly centred on vocation. Continuous medical education and continuous professional development, important in their own right, cannot supply all that is needed. LL aids society with its learning, and it requires an awareness of the environment and structures of society. It is heavily vicarious, draws on formal learning and relies for effectiveness on reflection, self-assessment and personal shaping of views of the world from different perspectives.

Conclusion: Health is critical to rational thought and peace, and determines society's capacity to govern itself, and improve its health. LL should be reshaped to focus on health not citizenship. Therefore, embedding learning in society and environment is critical. Each urologist must develop an understanding of the

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numerous concepts in LL, of which 'biographicisation' is the seed that will promote innovative strategies.

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Introduction

Urologists conscientiously pursue continuing education to remain certified, be responsive to patients and to be up-to-date. No strangers to lifelong learning (LL), they maintain excellence through continuing medical education (CME) and continuing professional development (CPD).

Rather than dwell on these established pathways to competence, which are well understood, published and practised, the objective of this review is to focus on the LL that develops the competencies required for an effective and greater function of physicians in the 21st century. Throughout this article the terms 'physician' and 'urologist' are used interchangeably, as what is true for urologists applies generically across all medical professions.

A glossary of some terms used in this review is included after the conclusion. Readers might prefer to construct their own meaning of terms which appear unclear to them on initial reading, or refer to the Internet or dictionaries, and so embark on their own foray into LL about aspects covered in this review.

Methods

Ideas generated by personal experience were listed and literature searched, with initial readings generating further exploration. Concepts used by philosophers, social scientists, and educational institutions, governments and UNESCO were explored to improve the understanding and value of LL. Challenges which could become the stimulus for LL were listed and grouped pragmatically; the value of CME and CPD revisited, and concepts of LL shaped to provide a pragmatic model.

Results

Autopoietic (see the Glossary), continuous, self-determined, informal, vicarious, 'biographicised' LL, from and for society, when supported by self-chosen formal courses, and conscious reflection and analysis, can build the capacities and portable skills that allow urologists to recognise and flexibly respond to the emerging fluctuating voices from society's governance structures, and changes in environment, as they refine and increase the usefulness of work outputs.

The need for LL is driven by challenges (see below), and the desire to ensure that society adopts useful innovations. LL flows continuously in pursuit of one

continuing agenda, which could either be citizenship, as is conventional, or as this review proposes, health. LL cannot be wholly centred on vocation, and CME and CPD, important in their own rights, cannot supply all that is needed (see below). LL aids the pace of society and learning, and needs clearer definition. It requires an awareness of the environment and structures of society. It is heavily vicarious, draws on formal learning, and relies for effectiveness on reflection and self assessment and personal shaping of views of the world from different perspectives.

Discussion

Challenges that dictate the need for new competencies

Instability and an uncertain society

Uncertainty, instability and complexity accompany individuals and society, driving them and their component health caretakers to greater achievements. These attainments come at a cost to individuals' equanimity. To ensure sanity, efficiency and greater productivity in such times of rapid change, a new essential overarching competence is required, i.e., the ability to recognise and adapt to change, and manage its consequences by synergising diverse resources from all vocations 'on behalf of society at large' [1]. How can this be achieved?

The society on whose behalf physicians must work is diverse and iniquitous. Its habits and systems (and these include many corrupting aberrations) are well set. Society abhors directives, being more influenced by electronic abbreviated messaging, and 'everything seen on the net' than by rational suggestions for change. In such settings, the already overworked physician has to treat disease, pre-set notions and their psychological aurora, and then reach out further into society to ensure a reduction in the disease burden and the physicians' workload. That can only be achieved through innovative strategies for prevention and cure, as current systems cannot be applied equitably across the world.

The workload, health-worker shortages, costs, complexity and other factors cause adequate healthcare to remain an illusion, a theoretical concept unattainable universally as there is much poverty, intolerance and discrimination. In the current fragile world, just as civic sense begins to prevail, sane systems become disrupted and the cup of equity swings once again past Tantalus' lips.

Civic societies in phases of peace are attempting to bring into general discourse every individual's voice

and ideas (in whatever form or character, philosophical, scientific, moral/spiritual), so that institutions, regulations, laws and administrative measures [2] reflect a totality of views. In such circumstances, most evidence becomes subject to many interpretations. Consequently, asking whether ‘*the proposed understanding, classification or index resulting from these interpretations is “right”*’ adds little value [3]. This adds another layer of complexity, with individuals asking for costly therapy when the outcomes are dubious. Sadly, even in these inclusive, wealthier and organised states, iniquitous exclusion from health continues, as a result of system faults, cost, complexity, employment, lack of insurance or reluctance for socialist spending.

Technology

Another challenge is posed by society’s love of technology, many investigative tests and screening programmes (a ‘technologicity’), its awareness of recent advances, and individuals’ anxiety about disease. Increasing technological options provide the urologist with more choices, causes longer discussions and greater use of time. Stone disease is assuming epidemic proportions and radiation spills will increase cancer workloads [4]. Changes in government [5] which lead to greater respect for individual’s opinions will require urologists to be very flexible in processing their ideas. They will need to astutely tailor their modes of communication and public discourse to the current thinking of society. Much of such competence can be gained through existing CME and CPD.

Difficulties in stopping sources that generate disease need additional attention

Urologists will have to contend with diseases caused by industrial pollution, both chemical and radiation (as seen in the recent Fukushima leak), question the degree to which our treatment methods lead to disease, design innovations, and take these successfully through the societal hierarchy.

As many interventions for different sets of disease will remain costly, it will be necessary to find and attack a few seminal causes. The plans for better health will therefore have to make forays into relatively unknown (for the physician) fields such as, e.g., those defined by Marmot [6], as social determinants of health, i.e., early childhood development, healthy living environments, fair employment and decent work, and universal, life-long social protection. That will require new knowledge and the ability to co-ordinate and co-operate with various sectors of society outside the medical field.

Educational systems

The current educational trajectories (which are costly forms of indoctrination that fail to supply the required workforce), do little to educate us on how societies function, make no forays into the concepts which physicists,

engineers and economists espouse, nor do they support the development of links with other professions. Little thought is given to innovative educational matrix-like initiatives that could overcome the shortages of physicians [7], although physician-assistants continue to be used to facilitate the work of physicians.

Difficulties in convincing society of the value of innovations

Between any innovation and its acceptance by society there is a large gap, posing a major challenge. We need to develop courageous individuals who will challenge the ways that medicine is practised, who speak the language of society, shaping discourse in terms familiar and pleasing to it.

That is not easy, because, generally ‘society’ obstinately refuses to question, shake and change any current belief [8]. Bordieu [8] attributes this to our comfort with the familiar, and our difficulty in moving away from the patterns on which we live our lives and manage professional work, as these have been shaped by the many institutions of society, in ways that bring in a congruity and concretisation of thought across the city, country and world. As Bordieu reminds us, the ‘*preconstructed is everywhere*’, and the preconstructed masquerades as common sense – that causes stagnation.

Development of personal judgement for prioritisation

Any of the above tasks is monumental, and so, in addition to the capacity to create an innovation and the tenacity to take it through society’s barriers, physicians will require a sense of judging which problem to tackle first.

Questioning the entrenched dogma of society is not an arena in which urologists and physicians are adept. However, it is appropriate that the urologist appears at the forefront of new initiatives that reduce disease, produces different work-force models, and works together with society. Innovative methods used by a newly designed urology work-force might be useful to all physicians.

How will all of this be accomplished? This review proposes that the ability to challenge the status quo and produce alternative innovations will be greatly facilitated by specially directed LL, achieved by embedding physicians in society.

Will existing CME/CPD components prepare the individual for these major challenges?

Existing educational trajectories (liberal arts to medical college and residency) are too narrowly focused and cannot empower physicians to solve current health problems in a world where the physician is no longer the linchpin (Table 1) [9].

Excellent parameters set by the national certifying Boards are useful, but they have problems in implementation and evaluation [10]. Specialty-related knowledge

Table 1 The challenges, agents and learning: Society and not the physician is now the linchpin!	
Where are the root causes of the challenges that LL must address?	
Examples of factors determining the state of society, individuals and their health	
The state of the individual in society	Governmentality Fears Knowledge from the Internet Restlessness
The state of society and its environment	Hierarchies between skilled and unskilled workers, etc. Stubbornness (regarding the pre-constructed) vs. responsiveness to the effervescent environment Warring capacity Polluting capacity, etc.
The state of society's health	Dependence on: complex structures for disease detection and health delivery that simultaneously generate new disease. Love of technology, etc.
Curative agents	
Prime movers	Physicians (currently unaware of fields outside their narrow focus)
Colluding agents	Society (which does not normally think rationally about health) Physical and emotional environments
Teachers, learning modes and opportunities that societies can provide	
<i>Teachers</i>	
Society, University, workplace	<i>Learning achieved through:</i> Immersion in society's culture, formal University/other courses and informal on-the-job learning
<i>Learning modes</i>	
Vicarious, autopoietic, heutagogic, authentic [9], reflexive	<i>Learning achieved through:</i> Imbibing society's culture; Internet, social media, and balance between work and life
Formal and informal	<i>Learning achieved through:</i> University and workplace

requirements are so complex that the resident is preoccupied with learning directly applicable information (e.g., complex guidelines) whilst coping with the pressures of work expectations. The consultant too has to work for many masters, i.e., administrators, patients and society. It is impossible to find time to attend the lectures of thinkers or mix with society. The consultant might then present a role model which degenerates into a factory model of 'work to be done neatly and on time'. Noble objectives are waylaid by the milieu of work conditions. Not only do 'empathy and the generosity of spirit take a battering', there is little time to think anew about what is causing disease and the ways in which the cooperation of society can be channelled into controlling it [11]. Only some of the new required learning can be achieved by simply using Pubmed or Google [11].

Can we rely on experience, after residency training, to impart the attributes needed for the 21st century? Experience is certainly a great teacher. In Camus' book *The Plague* [12], the doctor was asked: 'and what taught you all of this?' And the doctor replied: 'Suffering', indicating the immense impact of the practice of medicine on one's real learning. Physicians learn automatically from daily practice, as exemplified by the dire need for euthanasia in a man racked by the pain of carcinoma of the prostate, the inability of the poor to obtain medicines or vaccines, inaccessibility because of financial reasons, and the unavailability of chemotherapy drugs. However, classically the interaction with members of society is only at the level of the individual. Such interactions will not help move innovations through the levels of society.

What is needed is learning about societies as a whole, first gaining confidence to assert oneself into the discourses of society, and moving on to achieving an inclusiveness, and then cooperation of all the possible players who can help in the field of health. That should become part of LL.

Revisiting definitions of LL

There is no consensus on a definition, simply a plurality of opinion labelled as 'ongoing disagreements' [13]. In the past, LL has been variously defined as 'All learning activity undertaken throughout life, with the aim of improving knowledge, skills and competencies within a personal, civic, social and/or employment-related perspective' [14], or as 'learning pursued throughout life... which is... flexible, diverse and available at different times and in different places'... [15], or as DeLors [16] simply summarised it: 'Learning to know; to do; to live together, with others; and learning to become a complete person (in body, intelligence, sensitivity, and spirituality)'. However, then one can ask (and find it difficult to appropriately answer:) 'What is a 'complete person'?

One useful definition requires LL to be voluntary and self-motivated, but rather than use heutagogy [17] (a study of self-determined learning) to further define LL, far more important are the questions of 'LL for what' (and we can define it as 'for interactive inclusion into society')...from whom?, ...from what?... for what purposes? And how?

Hager [13] outlined the evolution of ideas on LL and the debates surrounding its acceptance in the contexts of general citizenship. From citizenship it is time to move to health, an important emergent agenda focus for LL across entire populations, ‘civilised’, ‘civic’, ‘intolerant’, or whatever they may be.

All definitions seem to encompass spheres of influence beyond the vocational. Whilst some still consider CME/CPD as LL [18], we could consider them rather as parts of ‘learning across the lifespan’ (LAL), and argue that their prime focus is vocationally driven, in which case they do not qualify for LL, a term which could possibly be reserved for learning in a continuum with a single large focus, from cradle to grave.

Perhaps we can differentiate LL from LAL in yet another way. LAL heavily relies on *formal learning* (which is achieved through courses, tested by examinations and recognised through a qualification or certificate), and *informal learning* (which similarly has expected educational outcomes, but occurs in settings where the main purpose is not education, e.g., ‘on the job’). These both have well stated objectives and set curricula, which one can obtain from the Internet or university. LAL is usually spaced [19], and interrupted, not a continuous pursuit of one major goal. Gaps between education and practical application are constituted by space and time, in which principles learnt and concepts ingrained are lost. By contrast, LL is continuous.

Currently a Liberal Arts education is part of discontinuous LAL. Taught in isolation to 17-year-olds, the impact of a colourful Boticelli painting or Mantegna’s drawing of the Calumny of Apelles (an originally Greek portrayal of the disgusting state of society) [20] (Fig. 1) is lost in memory, because real-life work is so stressed and rapid that there is little time to apply previous learning. They forget the lessons that the picture illustrates, i.e., the awful and false accusations by Calumny and her sisters, the stupidity of the judge (portrayed with the ears of an ass), and the humiliation of the innocent. This is because as physicians, they plod through a life of corruption, murder, terror, injustice, inequity, graft, political manipulation, poor governance and much worse, which is now taken as a norm by many.

Defining critical elements and the broad scaffold for LL

The most useful LL for the physician, would be continuous, have no endpoint, no pre-formed curriculum, and no assessment other than as a special auto-generated, reflective, ‘meta-cognitive’ activity. However, it would have a well defined source for learning (society) and well defined direction (benefit to society). Whilst learning from society and building relational networks, it must proffer services valued by society. It is internally driven, in contrast to the externally motivated learning that we undertake because of specific vocational/professional needs such as re-certification and job transitions.



Figure 1 The Calumny of Apelles, drawing by Andrea Mantegna (≈1504–6). Available online at: http://www.britishmuseum.org/explore/highlights/highlight_objects/pd/a/mantegna_calumny_of_apelles.aspx. The picture is explicitly explained on the British Museum Website as follows: ‘Each of the figures is identified in Mantegna’s handwriting. Sitting on a throne is the judge with large, ass’s ears, extending his hand to Calumny (Slander). Behind him stand Suspicion on the left and Ignorance on the right, who maliciously advise him. Calumny holds a torch in one hand to suggest her blazing fury, and with the other hand drags a young man by the hair. He stretches out his hands to heaven and asks the gods to witness his innocence. Envy, a thin pale man, leads Calumny, while two servants, Treachery and Deceit, adjust her hair and dress. The last two figures in the procession are Repentance, a mourning woman who wrings her hands, and finally Truth, pointing to heaven and with tears in her eyes.’ Reproduced with permission from the British Museum Website. Lessons for urologists: The deceitful nature of society has not changed from Greek times – the many drawings and paintings depicting the Calumny of Apelles all use a Greek description (and the artists imagination/biographicisation) to reconstruct the scene. Perhaps the problem is that this topic (discussed in liberal arts programmes) loses its impact as it is not brought to the attention of urology residents and young faculty. The persistence of corrupted society would be a very useful topic for physicians to attack (as it is the basis of many diseases). However, it will take the lifespan of a host of courageous individuals to develop pragmatic solutions!

The critical required element is that physicians and societies together continually reshape their learning. History tells us that each society has in an elaborately choreographed routine shaped its learning, whilst the construction and discourse (the conduct/culture) of society provides the music. History provides abundant evidence of ‘mental and social frameworks evolving together’ [8] (Appendix 1 [21–26]).

Immersed into society, the average individual is educated by having learnt from society, having gained insights about the ‘structuring mechanisms that operate from the existing cohort of “agents” and created opinions’ [8], and the predetermined communication strategies that infiltrate through political linkages, partnerships and hierarchies, which Bordieu comprehensively labels as ‘habitus’.

If we copy historical patterns of informal learning from society and environment more effectively, we will need careful perceptive study and perhaps formal analysis of both social processes and environment.

For it is; (i) the cultural processes and methods that underlay society’s functionality (and its *processualism*, if not *progression*) [8], which results from its flexible dealing with its institutions, hierarchies, thought processes and governance; (ii) the importance given to the individual (iii) the acceptance of feedback given to society; and (iv) the means whereby individuals can change the society which educated them in the first place, that will define and shape our learning.

Awareness of the environment

The environment affects our effectiveness, whether it be from environmental structures (e.g., water supply systems, quality of food supply, transport systems, pollution, city habitat) or environmental factors that have their emotional, political, educational, social, and hierarchical baggage.

Physicians attempting this new LL will also need to seek examples where physical and emotional environments have buttressed vicarious learning and forged inventiveness (e.g. Table 2) [27–29].

Embedding learning in society provides an input from many sources and creates realistic contexts which facilitate the development of ‘portable skills’ [9], including judgement (especially of the value of information), patience to follow protracted negotiations, capacity to recognise patterns and extract useful knowledge from the past to apply it to new problems, and the flexibility to work across all sectors of society, i.e., government, homeless, refugee, jobless, and the financially secure and financially affluent.

Overcoming the barriers of society

Designing an innovation is not enough. Anywhere during the course of implementation, changed

circumstances, triggered politics, sudden changes in previous agreements and regrouping of opponents can overturn the best plans. Politicians understand the value of discourse and shape their words to the sentiment of the people; physicians are used to ‘straight talk’. They have to learn to remain honest and select what to present to society, at what time, and in what ‘language’. Discourse is today, in Foucaultian terms, the key policing force of society, and the talk between physician and society must be geared to the processes and culture and the talk (*habitus*) and modes of working of society.

Should all this learning be achieved by course work, or vicarious automatic learning? Should we define parameters of learning or let it proceed autopoietically, in a self-generated cascade?

Learning by immersion is vicarious learning. We could argue that vicarious learning will not be adequate and despite all of the above, the urologist might remain as ignorant about society or methods of promoting any innovation as the man in Faust (who after all that learning in philosophy, jurisprudence, medicine and theology, remained ignorant). Would it then be expedient to have a well-defined curriculum?

No! There can be no set uniform predetermined curriculum for LL. No curriculum for LL can be defined for anyone by someone else.

By contrast, preparation for LL is possible during formal compulsory education, through the development of the general attributes of a good citizen, and by valued portable skills, even if necessary in virtual laboratory settings [9].

How will physician–urologists find the extra time for elements of LL not required for re-certification?

People always find time for activities that help them to enjoy life and/or facilitate work. The physician’s interest in a societal orientation of LL will be awakened by a realisation of; (i) the value added by that learning; and (ii) the minimisation of effort and time required for learning beyond that for the CME/CPD required for re-certification.

Physicians should be reassured that much vicarious learning occurs by an insidious penetration of their experiences into their brains during routine or social activities. The fear of inadequate time can be dispelled by drawing attention to *contexts of learning* which are part of everyday life, where enjoyment and social activities blend with learning about society, and where the only additional time required is for critical reflection.

Contexts of vicarious learning

Yeaxlee (cited in [21]) wrote: ‘Much adult education will never know itself as such, it will go on in clubs, churches, cinemas, theatres, concert rooms, trade unions, political societies, and in the homes of the people

Table 2 Three examples where the physical, chemical, intellectual, educational and emotional environment ‘agents’ have buttressed or interfered with valued learning across the lifespan.

Environment	Example
Physical environment as an agent	The city creates illness but also can be an incubating intellectual crucible Birmingham has provided a raised plateau which results in continuing peaks of innovation from 1776 to date [27]. In 2000, of the 4000 patented inventions, 2800 came from an area within a 35-mile radius from Birmingham [28]. People ‘cycle’ in this city
Emotional, intellectual, financial and chemical environments as agents	
Poor early childhood environment as a destructive agent	The level of poverty is severe; its debilitating effects, the damage caused (by poor childhood development, exposure to social [gangs] or chemical agents) can all cause methylation of genes [29]
Effective early childhood development	The agencies of a mother’s love, appropriate schooling and care (aided by the agent ‘affluence’) propel the individual into an advantaged trajectory of learning
Educational environment; society’s most powerful agent for enforced congruity	
Indoctrination	‘Thou shalt work on these guidelines...’
Exploration and promotion of biographicity	Virtual learning environments providing what Lombardi calls ‘authentic learning’, where students can safely investigate results of alternative actions
Current school years, 4–16 years	Layers of social conditioning imprint permanent (society-compliant) behaviours but restrict the biographicisation of knowledge Indoctrination into ideas of overriding social good (making more money so that the city is rich) then eclipses the ecological disasters causing disease by, e.g. pollution or cigarette smoking

where there are books, newspapers, music, wireless sets, workshops, gardens and groups of friends’. And again, ‘But adult education, rightly interpreted, is as inseparable from normal living as food and physical exercise. Life, to be vivid, strong, and creative, demands constant reflection upon experience, so that action may be guided by wisdom, and *service be the other aspect of self-expression*, whilst work and leisure are blended in perfect exercise of “body, mind and spirit, personality attaining completion in society”.’

Even when not motivated to explore the nature of societal interplay, the urologist is continually bombarded with sensory inputs from the environment and the people who constitute society. This is an integral facet of work and living, and of life, which is a vast learning plain on which battles are being fought daily, and in which nuances of action, character and circumstance modulate or dramatically shift what happens to patients, to coveted schemes, and promotion paths, to the surgery at hand, to the purchase of equipment, etc.

Whilst it can be argued that no additional time is required for learning, dedicated time must be available for contemplative thinking, if only to let the physician become aware of it. Without knowledge of key competencies gained from it, people do not value it, and consequently continue to harbour low self-esteem [30].

Reflection to enhance ‘biographicity’

Reflection on each day’s experience allows an individual to attack and challenge the concepts previously espoused by oneself, the set ideas and interpretations of what is happening in the environment, then to have

new dimensions shaped by the personality and by the effects of what is happening around at that time. This personalised element in learning has been succinctly encapsulated in the term ‘biographicity’ by Alheit, who suggests that such constant interpretation and reinterpretation allow a reshaping of one’s life in a changing environment [31,32].

As we structure this ‘biographicised’ understanding of the surrounding world in a way that builds a pleasing edifice, there is a greater chance that we find the special focus on which we accumulate social capital for our debut into society in the larger, more helpful role of propagating our chosen special niche.

An attempt at synthesis – what forms could LL take?

Our life-successes depend upon our approach to gaining an optimised balance between time usurped whilst benefiting society and the freedom available to pursue personal goals and maintain family happiness, an ultimate self-expression indicated by Yeaxlee and exemplified by persons such as Edhi [33], who lives very simply, but has the largest volunteer ambulance system in the world, and provides home and shelter to orphans and widows.

Each of us must decide the cause to be championed. It must begin with our overcoming that inertia that makes us accept current ways of attaining health as the best way of doing things.

Learning in the context of society with no set curriculum, when biographicised, allows individuals to understand the happenings in the environment in ways other than those learnt during formal education. The imprints

left on the brain from many sources (stored in formats favoured by disciplines with differing conceptual thinking), allow the person in the middle of rapid changes to determine and see the evolving relationships and the changing juxtapositions that have the potential to create a structurally new way of thinking. Abhorring rigidity of thought, wonderful opportunities for questioning the once-taken-for-granted assumptions arise, opening pathways to powerful suggestions for the future modern practice of medicine (urology, in this case).

The assurance with which one can accept these statements as being true

Whilst this review has been written as if it recorded certain and confirmed truths, as Hager [13] points out, there is a need to research and better understand LL, and then perhaps we might concretely, ultimately, document proof for or against the hypothesis that ‘informal learning from various daily events is ultimately of dubious value’.

Until then we could persist with the view that LL, with its emphasis on learning as required and as desired, and in ways insidious and penetrating, with a focus on health not citizenship, is in reality the ‘elixir of life’. As such it provides ‘special nutrition’, whilst at the same time functioning as a stimulus to the 21st century physician who works in a challenging, chaotic and eternally changing environment.

Conclusion

As health is critical to rational thought and peace, and determines society’s capacity to govern itself and improve its health, LL should be reshaped to focus on health not citizenship. For this to happen meaningfully, embedding learning in society and the environment are critical, for society can provide important feedback that prevents the discarding of well-laid plans; the environment too needs to be considered when formulating pragmatic strategies for health. Each urologist needs to develop their understanding of the numerous concepts in LL, of which biographicisation is the germ for innovative strategies.

As Eylon writes, ‘A [wo]man of genius [too] must constantly renew himself/herself, otherwise [s]he is ossified.’ [34]. And so too do we all.

Glossary

Autopoietic: This term is used here in the sense of ‘self-generated and self-replenishing’ (as when, e.g., initial readings lead to further exploration of texts to better understand or unravel the meanings that authors implied, perhaps in a never-ending renewal of interest in learning more). The term has been generally applied to

(biological) systems and processes, which continuously regenerate the network of processes that produced them (http://www.media-ecology.org/publications/MEA_proceedings/v10/13_varela_maturanda.pdf) and has been extended in the fields of biology and cognition by others, not without controversy. Others have applied the concept to organisational learning.

Biographicity: The result of a layering of personal views, opinions, insights and perhaps bias onto everyday occurrences, to create an individualistic perspective or interpretation. The best definition is perhaps that of Alheit, given within the text.

Processualism: Defined by one dictionary (<http://dictionary.reference.com/browse/processualism>) as the study of social structures by analysing and comparing their processes and methods. In this review the term is used more to avoid the phrase ‘the progress of society’, and to use instead the transmission or procession of society through time. This avoids making a judgement as to whether the observed changes are a sign of real progress or simply greater comfort for the individual, resulting from enhanced achievements and capability of society which might not be real progress because they might be coupled with a devastating permanent and difficult to eradicate destruction of the environment.

Heutagogy: A study of self-determined learning, a term coined by Hase and Kenyon (<http://en.wikipedia.org/wiki/Heutagogy>).

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Appendix A

Conceptualisations. of LL across the millennia

For millennia, society has learnt from apprenticeship and life experiences, according to need, force of circumstance, or environmental opportunity. Threats such as

those of Hammurabi's code [21] ('an eye for an eye') as early as ≈ 1750 years BCE kept learning on track. This provided a useful education, and resulted in special expertise in many areas, one example being the stone masons who built cathedrals across Europe.

As the necessity for acquisition of more diverse knowledge than that related to trade became evident, schooling had to be formalised and made compulsory. However, by the early 1900s, rural migration into London drew attention to the deficient education of these youths in the norms of civic and moral life. Adult education was therefore begun as informal bible readings at first, by the YMCA, but slowly expanded to include vocational training and citizen education. Thinkers (Yeaxlee [21], Faure [23] (UNESCO 1972), Delors [16], Medel-Anonuevo [24] (UNESCO 2001), Foucault [5] and Bordieu [8] brought in fresh understanding as to what learning and education would be of value. However, governments remained anchored to the concept of supplying 'education' and viewing this as a 'political and societal challenge... decisive for the prospects of the individual, the success of industry and the future of society' [25]. Greater understanding of modes of increasing retention of learnt material shifted the focus from education to learning.

Further understanding of adult, formal, informal, heutagogic (self-determined), autopoietic (self-generating) and vicarious learning (which occurs by 'osmosis' from the environment) has emerged. A transient flirtation with andragogy ended with the realisation that pedagogy refers to foundational learning and not paediatric learning.

More recently, society recognised the value of personal interpretations of perceived information in driving creative energies that led to innovative strategies. The acceptance of the importance of this personal interpretation of knowledge made society respect the status of the individual, and this has caused a major shift in governance structures from their previous hierarchical modes of function. Ancient society moved slowly through phases of accepting religious prophecy, monarchy and dictatorship (a 'one-man-knows-and-controls-all' concept) to a realisation of the importance of society in toto, and parliamentary forms of governance. Today, as a result of the realisation of the importance of the individual ('every person's viewpoints are of value') governance has now shifted to the new power base, that of discourses between people, leading Foucault to term it a 'governmentality'. Eaton [26] elaborated and complexed these ideas to fit with the current fascination with system functioning, and drew attention to a dichotomous point where systems will either rapidly flourish or self-destruct. It is for us to make lifelong learning productive and push systems in the correct direction.

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