

Long Term Optimum Strategies for New Engineering Faculty: A View from a Decade Down the Road

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Introduction

New and/or young engineering faculty experience a variety of situations, perspectives, and challenges unique to their fresh arrival on the scene of academia. Many of these are associated with the need for the new professor to prove/“establish” himself/herself in his/her discipline and hop on the treadmill in a mad rush toward the “life and death” (or so they seem at the time) goals of promotion, tenure, merit raises, and national/international professional reputation [1-4]. In many instances, the intensity of the effort and associated time and energy demands outweigh even those of graduate school. The new professor often is totally dedicated to and immersed in this effort, essentially placing all other priorities, even family, on the “back burner”, as an “investment” in the future that will pay dividends after the above goals are reached, say in roughly a decade.

As a relatively new/young professor (during my fifth academic year), I presented “Development, ‘Survival’, and Retention of Young Engineering Faculty: A Front Line View” at the Fall 1986/16th IEEE/ASEE Frontiers in Education Conference in Arlington, Texas. This very well received presentation and associated full-length paper published in the Conference Proceedings [5] detailed my still relatively fresh but experience-tempered perspectives and recommendations on strategies for the new/young engineering professor to successfully but ethically pursue the above professionally critical goals, as based upon my four plus years of experience “playing the game”. A key tenet of the presentation/paper was the need for the new professor to generate, contribute, and publicize “Academic Wealth”; that is, activities, services, and documents that are perceived as valuable contributions to the institution and/or professional community. Academic Wealth was attested to be optimally generated when one combined high degrees of effort, time, commitment, and boldness with both working hard and working smart.

A decade has passed since this presentation/publication and a lot of water has flowed under the bridge of my professional and personal life. The initial professional goals have been, by and large, reached. The initial rush of energy, time, effort, boldness, and commitment has been replaced by a sense of and need for “pacing”, balance, caution, and recognizing one’s limitations in professional “midlife”, while still generating academic wealth at a new level of true/lasting (verses perceived) value.

This paper will again discuss my (updated) views on optimum strategies for achieving professionally important goals (i.e., Academic Wealth), both as a new professor and as one moves into the midlife/mainstream as an engineering educator. However, the concept of Academic Wealth has to become moderated/complemented by balance, moderation, and “pacing” (collectively to be referred to as “Academic Balance”) as the scope of one’s

professional, personal, and family commitments broadens, and one's creativity, energy levels (physical, intellectual, and emotional), free time, boldness, and odds of being forgiven/"cut some slack" (i.e., for mistakes or over ambition) by superiors/colleagues tend to decrease as one leaves the first decade in academia. One begins to search for significant and lasting value/"return-on-investment" from one's precious and always too little time and energy, rather than simply generating resume' fillers, as are often emphasized in the first few years in academia. One begins to recognize that his/her "mission", for better or worse, has been set in the field of engineering "teaching, research, and service" and that part of the significance of one's life will be in the true, lasting contributions in these areas, especially in the lasting effect that one has on the subsequent lives of students. Balance (walking the razor's edge between extreme positions/methods), maximum efficiency/effectiveness (payoff per unit of time and effort), working smart (as possible), and effective, sensitive human interaction (including institutional "politics") become increasingly important. The need for these is further exacerbated by the (supposedly) rapidly changing nature of engineering education [6] (multimedia [7], distance learning [8], computerization, decreasing emphasis on and funding for research, etc.) and the increasing challenge to remain "current" and known in one's field.

Review of "Academic Wealth"

"Academic Wealth" was defined [5] as any service, activity, product, etc. that was perceived, primarily by administrators, as having value, either tangible or intangible, to the institution. This value could be financial but more commonly would regard image, reputation, or publicity for the institution in arenas including potential students/parents, community support, research funding or publishing opportunities, state government support, etc.; i.e., "advertising" favorable to the university's administrative units or administrators. As is standard in advertising, perception is as important as reality and often, albeit unfortunately, this principle holds true in the relationship between educational institutions and external (and sometimes internal) constituents. Of course, a positive perception of the institution by these constituents does have a true value to the institution because of the positive and often concrete (i.e., economic) impact that it has on decisions of constituents to support the institution. However, Academic Wealth ideally has a broader value. For example, research and associated dissemination often generate societally-useful processes or systems as well as providing student participants an invaluable supplement to their education [9]. Community service often does result in permanent improvement of the quality of life in the community or region. Innovations in teaching do usually positively impact the quality of student education.

However, most academicians can point out instances of "exercises in futility" (e.g., endless committee work, reports, etc.) that rarely produce any serious, permanent improvement in the operation of the university. Aggressive public relations/publicity campaigns often have only temporary impact ("Nothing is as old as yesterday's news"). Nevertheless, such activities, both those producing true permanent value/improvement and those that don't, are emphasized in promotion, tenure, and merit pay decisions, often are quite conspicuous, and, hence, promote rapid "positive feedback" that can produce the impression in new/young faculty that such activities are the basis of true Academic Wealth, when in fact, they often are simply facades, smoke and mirrors, or the above-mentioned exercises in futility. This has become to also be suspected in the "real world" in recent years [10, 11] and has led not only to a decrease in respect

for the professoriat but also for calls for abolishing tenure.

Often the “time constant” associated with truly significant innovations (e.g., profound research findings or developments, breakthrough teaching innovations, major/permanent contributions to the community/region) is much longer than that of the superficial, “busy work” activities mentioned above. In some cases, it may take years to gather, verify, refine, and model the data required for a significant theoretical innovation, or work out all of the “bugs” in a practical invention. Proof of the effectiveness of a teaching innovation (vs. the more common “educated” projection/speculation) may require many semesters of objective student assessment data [12]. Such activities may yield a presentation, publication, or episode of publicity only every few years. Compare this with the perceived need for the new/young educator to quickly build a voluminous curriculum vitae, not, only for promotion, tenure, and merit raise purposes, but also to build creditability in one’s field for attracting external funding. At this stage, quantity is perceived (and may be) as/more important than quality; i.e., urgency dominates (long term) importance. Tenure decisions usually are made within 5-7 years after hiring and two or three presentations/publications, even if truly profound in one’s area of expertise, usually won’t be considered as favorably by administrators, and promotion and tenure committees as 10-15 presentations or publications, even if these latter ones are of the short, trivial type (“You only get tenure if they have to also use their toes to count your publications”). There is, unfortunately, strong pressure to subdivide research results into small, numerous “bite size” publications/presentations, make multiple repetitive presentations over similar material, plan/propose projects with short term but far less valuable results, chase a large number of service and committee positions of marginal value, and grab any chance for publicity, visibility, or influence that comes along.

An aspiring physics professor who attempts to develop a Unified Theory of the Universe over the five to seven year tenure period will, even if successful, probably not be tenured because he may only get one or two publications out of the effort (even though he may win the Nobel Prize a few years down the road). Thus, often (but not always) a new/young professor will end up generating a lot of resume’ fillers that do serve the immediate need for promotion, tenure, merit pay, and initial (but still marginal) visibility/creditability in one’s field but rarely have, unless closely linked with the efforts of more established senior faculty with a longer time perspective and time constant, much long-term “breakthrough” significance in the grand scheme of things. Longer term, more challenging/taxing, and potentially more valuable projects (to one’s field and society as a whole) are often shunned or circumvented as not having a sufficient “benefit to cost/risk ratio.” When multiplied by hundreds or even thousands of new/young faculty in engineering and science, these lost/missed opportunities for true, lasting contributions in “research, teaching and service” really add up. This is especially true since it is generally accepted that the first ten or so years of one’s technical career is the time of greatest creativity, energy, and, hence, potential contributions.

In addition to these missed opportunities, the emphasis on quantity also compels the average new/young faculty to spend huge amounts of time (often up to 60-70 hours per week) in pursuit of such. Often one’s life is deliberately restructured to accommodate this “busy” workload to the exclusion of hobbies, health, and family, all in the name of “an investment in the

future” and with the idea that “someday,” after promotion to Full Professor, after tenure, and after financial “security,” one can slow down, relax, and rest on one’s laurels. Unfortunately, the sole focus on career advancement and visibility, especially if positively reinforced by superiors, colleagues, and/or students, can become addictive and an obsession, as is well known in the business field. One “thrives” on the accolades, attention, and “accomplishments” and is driven to continue to “succeed” via generation of Academic Wealth even after tenure, promotion, financial security, and recognition are achieved in one’s field. Often this pattern will continue, sometimes to the detriment of other aspects of life such as health, family, and self-fulfillment which may not be critical in the short term but which are critically important in the long run, until a “slap in the face” (“Thanks, I needed that!”)/“wake up call” comes a decade or two down the road.

Midlife Phenomena

This pattern of “workaholicism” will usually continue after tenure is granted for a variety of reasons. The sense of accomplishment and pride and praise/publicity produced from a growing list of activities continue to motivate and drive the individual toward even higher levels of success. Furthermore, one, after a decade or so, will have so many “irons in the fire” and “tigers by the tail” that it is nearly impossible to simply walk away from any; that is, there is a strong “maintenance” aspect to one’s activities that often is not fully anticipated in the early years and which ends up often tripling the amount of time and effort required to keep all of the balls in the air. For example, when one obtains a research grant, he/she doesn’t only have to perform the proposed research but he/she must hire and manage, on a day-by-day basis, student or faculty assistants, must write endless interim, annual, final, and followup reports and new goals/objectives statements, must keep up with budget figures, must purchase and maintain supplies, chemicals, and equipment, must work with and report to the research and safety units on campus, must disseminate the results through publications and presentations, and on and on and on. Often, it is nearly impossible to find any time left to actually perform the research unless the relatively quite evening and weekend hours are worked.

Financial considerations, especially those of summer salary, may also continue to drive the professor to keep a multitude of proposals in the works since statistically less than one in five are usually funded. Unfortunately, at most institutions, summer courses are not sufficiently numerous to guarantee everyone full-time summer employment. If this guarantee is important/critical in order to pay the mortgage and car payments, feed the spouse and children, etc., the professor will be required to chase all reasonable opportunities for summer funding.

One also gets trapped in a pit of commitment to others. Student assistants depend upon research salary being available, the Chair/department depends upon one’s productivity as a key contribution to its total productivity, joint-or multi-institutional projects require one to do his/her part for the others in the project, often over a multiple year period. Again, one simply cannot walk away.

One is also compelled (and rightfully so) to remain current and accomplished in his/her field so that, if necessary, he/she could obtain another job; this is especially true considering today’s tight engineering education job market and significant changes in the philosophy and

“modus operandi” of engineering education (and practice). One simply cannot fall behind in computer technology and educational “innovations” such as multimedia, distance learning, etc. or he/she may become unemployable or unable to adjust to a “higher-tech” environment at another institution. Again, this makes it difficult to sit back, rest on one’s laurels, and watch the world go by; one will be left behind unless time and effort are expended to stay up-to-date in the explosively changing engineering profession.

After 10-15 years of working “in overdrive,” subtle realizations begin to creep in. One begins to occasionally resent the never ending and often trivial or arbitrary demands for documentation, justification, etc. One feels that he has already “proven” himself, should not have to constantly explain, and should be taken at word. One begins to fully sense the less-than-optimum manner in which committees operate and the rarity of their recommendations being taken seriously. One begins to question the true, lasting significance of the smorgasbord of “busywork” activities and accomplishments generated in the previous rush toward promotion, tenure, and reputation. These and other sneaking suspicions often cause the middle age professor to undergo a serious assessment of where he’s been, where he’s at, and where he’s going.

Furthermore by age 40 or so, one begins to sense a pronounced decrease in both physical and mental energy and feel more tired and drowsy at the end of the day. The old “spark” becomes very weak at times, the “go, go, go” battle cry loses its attractiveness, and the idea of writing or grading papers to 1 a.m. becomes downright disagreeable at times. Furthermore, twenty years of partial neglect of one’s health can, by the mid-40’s, be reflected in developing health problems (hopefully minor); high blood pressure, blood sugar abnormalities, gastrointestinal difficulties, allergies, etc. that can all begin to further drain one’s physical energy. Just as important is the gradual decrease in intellectual “sharpness,” creativity, memory, and organization. One may begin to become vague on or even forget little things once known well. Facts, dates, and numbers may become obscure. One begins to use the handbooks and review old textbooks more than in the past. Ideas just don’t pop in and out of the mind as fast as they used to. It becomes harder to “keep the big picture” in mind and assimilate and integrate as large a volume of facts, figures, commitments, etc. as in the past, and one starts to rely more on “To do” lists, “Post-it®” pad reminders, calendars, etc. Although rarely a serious problem, this effect does decrease one’s ability to “push the envelope.”

Emotional energy also begins to wane a bit. One finds it increasingly difficult to hold up to the day-to-day demands and commitments without feeling some stress-related discomfort. While in the early years new professors often are quite vocal and assertive in departmental or committee controversies, when they reach middle age, they suddenly find it distasteful to engage in argument, controversy, or “territorial” debates. Criticism and being questioned become harder to accept. In some cases, the experience and maturity of a decade or two in academia lead to increased empathy and sensitivity to the problems of others (e.g., students) which can place a mental toll on the professor if he becomes too personally involved. This decreasing emotional “constitution,” when coupled with there being far less leniency/forgiveness for mistakes, rashness, over-ambition, or perceived insubordination from one’s superiors after the pre-tenure “honeymoon” period is over, causes one to become much less bold and more cautious in one’s job. Fewer memos are written and with more thought. Controversies are avoided if possible.

Proposals and budgets tend to become less ambitious and flamboyant; a sense of reality and feasibility replaces gross ambition as one becomes keenly aware of personal and institutional limitations and history. One begins to document, verify, and “cover his tail” more.

This caution is exacerbated by a tight engineering education job market and periodic changes in university administration. One tends to become a little more sensitive about job security, even with tenure. A common phenomenon is that during the first decade or so of hard work and accomplishment, the new/young professor becomes quite well known by the university administrators, often even by the President or senior vice presidents. He generates credibility and familiarity that increase the odds of his proposals or efforts being taken seriously and approved and give him accessibility (direct calls or visits) to the administrators. Suddenly, there is a change in administrator(s) and the name recognition, “favored status,” and accessibility disappear. He is no longer one of the “fair haired”/“good ole” boys but is suddenly just one of the crowd who must regain, by again expending time and effort, the advantages once enjoyed. Suddenly “yesterday’s glories” no longer matter and he is tempted to jump back on the treadmill. However, this time he questions seriously if the potential benefits outweigh the costs.

Family and external commitments also increase. Usually by age forty, one’s children are approaching junior high with an exponential increase in sports and other extracurricular activities that the parents have to service. Increasing financial demands sometimes compel a previously nonworking mother to go to work and suddenly the parental and household duties have to be more equitably shared, placing additional time demands on the middle age professor. The same financial demands and the increasing age of one’s home, automobiles, appliances, etc. often also require that more time be spent on upkeep and maintenance than in the early years.

One realizes that there are just a few more years of “prime time” left with the growing children, one’s aging parents and other relatives, and one’s own “youth.” One often begins to revisit old hobbies that may have been on hold for twenty years and finds them appealing and rejuvenating. Suddenly the idea of working every evening and weekend just doesn’t seem relevant to evolving life perspectives and goals.

Although, in a sense, “obvious,” the above effects are often not fully anticipated by a new/young professor and can come on suddenly. A death in the family, a serious illness, a sudden change in university administration or mission, etc. can startle the middle age professor into reassessment of his personal and career aspirations. Other times, the realizations come on more slowly. However, almost always, by age 40-45, the professor will be formulating a new professional “paradigm” that will seek to balance the need for continuing true (vs. perceived) professional accomplishment and competitiveness with the “new” external demands, desires, and perspectives through a combination of optimum efficiency, effectiveness, and sensitivity to others (i.e., “working smart” vs. “working hard”). He begins to recognize that, for “better or worse,” his mold is cast and his mission in (his professional) life is in/for academia and its constituents and he must balance this mission with the broader mission of being true to himself, his family, and his values.

Academic Balance

In sports, especially track and field, the concept of “pacing” is important. If a team or individual (e.g., long distance runner) exerts too much energy too soon, they will tire and not be able to “turn on the steam” in the critical later stages of the competition as their competitors leave them behind. In life, there are many cliché’s, proverbs, and fables attesting to the importance of both balance and moderation; extremism, excesses, and obsessiveness in nearly anything are well understood to lead to problems.

Furthermore, it is commonly said in the fields of business and time management that “efficiency” and “effectiveness” are not necessarily synonymous, nor are “important” and “urgent[13].” Efficiency is “doing the job right” but effectiveness is “doing the right job.” One can be highly efficient (in terms of output per unit input) but if the output has no true lasting value, this efficiency is in vain. Things that are truly important (health, family, personal and spiritual development, planning/saving for retirement, etc.) are often not urgent or pressing, at least not until some crisis brings them to the forefront, while trivia (e.g., meeting arbitrary deadlines, filing routine reports, putting out everyone else’s “fires,” etc.) often seem urgent yet really have no importance in the grand scheme of things.

The long term significance of one’s professional contributions has to be assessed primarily by a single criterion: What positive, lasting impact did these contributions really have on the lives of others: students, colleagues, the university, the community/region, one’s professional field of expertise, and society as a whole? These are the things that will invoke letters and statements of praise at retirement or other professional milestone celebrations and heart warming condolences and testimonials upon the illness or death of oneself. These are the things remembered decades down the road, not the countless instances of resume’ fillers and busy work.

These four concepts: (1) pacing, (2) balance, (3) moderation, and (4) a quest for lasting, human-sensitive/serving contributions (i.e., true effectiveness)with maximum output per input (true efficiency) collectively form a broader paradigm defined as “Academic Balance” of which the original paradigm of “Academic Wealth” is a subset/corollary. True and optimum Academic Wealth, over the long haul, will accrue only if linked to Academic Balance. If not, one’s efforts will often end up being a “flash in the pan” as the afterburners run out of fuel and the world moves on in a decade or two. By utilizing the tenets of Academic Balance in the early years of one’s career in academia, the odds of “burnout,” personal/family problems, and poor human relations in later years will be reduced and one’s general, long-term happiness, energy, and fulfillment will be increased.

Miscellaneous Principles Associated with Academic Balance/Wealth and Mid-Academic Life Success

This section will briefly discuss a few miscellaneous principles that the new/young faculty member should seriously consider. Some are based upon the personal education gained by the author in “the school of hard knocks” or by observing colleagues. Many of the problems arising out of not following these principles may not show their ugly heads for some years but

eventually will rise up to bite the violator.

1. Do not sacrifice the time deserved by children, spouse, and family. Each year of a child's life is precious and unique and can never be recaptured. If necessary, sacrifice personal hobbies first but forge out time for family at all costs.

2. Anticipate that the expenses and demands (e.g., time, transportation, etc.) associated with children's activities will suddenly increase around 12-13 years of age. Be prepared to have far less "free" time available for job-related "homework." Do not overcommit on the job after the first decade or so.

3. Do not neglect your physical, mental, emotional, and spiritual health. Eat right. Lose weight. Exercise. Socialize moderately. Get plenty of sleep. As much as possible, continue to read, listen to music, and pursue external interests and hobbies. Continue to practice your religious faith and community service. All of these will go a long way toward maintaining the critical energy needed in later years when it tends to naturally decline, avoiding burnout and stress, and maintaining happiness.

4. Actively learn and practice wise financial and household management. Get to know TIAA/CREF inside out. Become a savvy investor and business person as early as possible. Don't assume that the future and retirement will take care of itself. Master the "magic of compound interest." Build a nestegg so that you could weather the storms of temporary unemployment. Avoid excessive credit and debt.

5. Actively learn and practice human relations and management skills. These will improve all aspects of your job and life as well as giving you an inside track to possible administrative positions in mid-or late-career.

6. Be prepared for the drop in physical energy, motivation, and even interest in your profession around age 40-45. Don't assume that you can continue in overdrive forever. "Make hay while the sun shines."

7. Expect the inevitable "generation gap" between you and your students. New/young professors, especially those fresh out of graduate school, usually develop an excellent rapport with their students for several years and are often perceived by the students as "one of them." However, as the wrinkles and potbelly form and the hair thins and grays, this won't continue. One day you will realize that you no longer know the names of every Top 40 hit and its artist and, in fact, country music is more enjoyable than "rock 'n roll." You will find yourself fussing about that "younger generation" as students begin to think of you as one of the establishment rather than one of them. This will tend to reduce your general popularity (but not necessarily respect) among the students. They will not be as apt to seek you out for chats or counseling and you may lose advisees to younger faculty.

8. During the first few pre-tenure years, you must strike a balance between building an adequately long/voluminous resume' and choosing activities with true, long-lasting potential

payoff. However, after a reasonable resume' and reputation are established, begin to carefully screen potential commitments carefully for long term, lasting benefit to yourself and others. Avoid trivia and busywork.

9. Don't bite off more than you can chew. It's easy to propose to hang the moon in proposals but when you are expected to deliver down the road, you may regret it. Be as realistic as possible within the context of reasonable ambition and innovation. Remember the often hidden "maintenance" aspects associated with most activities that can triple the amount of time and work required.

10. Related to 9. is to always deliver what you promise and follow through on commitments. Nothing will kill a career like not delivering what's expected. Your word must be your bond. Excuses rarely will be taken very seriously.

11. "Luck" occurs when preparation meets opportunity. Know what you want and need professionally and do all that you can to prepare so that you can "jump" when the opportunity (often a short-lived window of opportunity) arises. Remember that in the university funding arena, "first come" is often "first served."

12. Never settle for sloppy or half-done work or documents. "Engineering is in the details." Aim for high quality. A little with quality is worth a multitude of slop. Of course, there is a point of diminishing returns (say, in the number of content revisions) but, in general, aim for high quality in all work.

13. Do not underestimate the importance of written communications. In academia, these are usually as or more important than technical ability in building a reputation and creditability. Although often time consuming, when clearly indicated, write articulate, grammatically perfect memoranda, proposals, and reports.

14. Actively develop time management skills. Cull out unnecessary distractions, interruptions, visitors, and trivia. Practice good mail processing techniques. If necessary (not frequently) lock and don't answer your door (or even phone); alternately, go to the library or a laboratory to get some large blocks of uninterrupted time. Have secretaries screen calls and visitors when necessary. On the other hand, do not generate a reputation for being unavailable or unaccessible. Use common sense.

15. Delegate as much as possible. Train and utilize secretaries, technicians, student assistants, and colleagues as much as possible. Try to always have a few "right hand men" to fill in for you and keep you posted.

16. Strive to establish an "infrastructure"/"territory" that will allow one to temporarily "coast" during times of no external funding, low energy or poor health, or unusual external demands; that is, a system with "momentum" to get one over the rough spots.

17. Balance the necessity of excellence in teaching with the tremendous time demands of

homework, test, and assignment grading and student visits to one's office for assistance. Excellence in teaching is critical to success in academia but too much (vs. adequate) emphasis on preparation and assessment can seriously limit time for other facets of Academic Wealth.

18. Actively stay abreast of all areas of computer technology in the education and practice of engineering. To fall behind could be the kiss of death if one were to change jobs.

19. Actively make time to read journals in one's general field and particular area of expertise. Things change quickly. The period of obsolescence in engineering information is often said to be five years or less. You must remain marketable. Become indispensable to your institution but don't let it become indispensable to you.

20. Continue to publish and present research results with an emphasis on fewer but more profound works.

21. Establish and nurture a wide and deep network of contacts, both within and, more importantly, external to one's university. Scratch a lot of backs, do a lot of favors (usually small), and become true friends. Stay in frequent contact. Get on a first name basis. Get a fat "Rolodex." These contacts will be worth their weight in gold in a huge number of situations, including letters of recommendation, joint research opportunities, new job opportunities, etc.

22. As much as possible, try to mold yourself to fit local/regional engineering needs (for instance, manufacturing engineering in Northeast Arkansas). This will aid in the contact network (21.) and present opportunities for external consulting or research projects [14]. However, do not do this to the exclusion of one's research expertise (even if it is esoteric or eclectic).

23. Actively seek and serve in external offices and honorary positions (community or state committees/commissions, professional organizations, etc.). These carry a lot of weight in promotion and tenure decisions, further broaden one's contact network, and are important to marketability. On the other hand, limit the number since they will often involve travel and a lot of time.

24. Pick your battles carefully and don't make enemies for nothing. They will often come back to haunt you. Don't be confrontational unless the importance or ethics of the issue demands it. Don't hold grudges. Be willing to apologize. On the other hand, if the issue does deserve it, stand your ground but as diplomatically as possible. Don't be gullible or a "pushover" on issues of real importance.

25. Be extremely careful of what you say and, especially, write about anyone, especially superiors'. Try to anticipate how your words will be interpreted or distorted through the "grapevine." Expect the worst case interpretation and adjust accordingly. Avoid useless and time "consuming gossip." Don't be overly pessimistic or cynical. Don't assume that any "secret" or "confidentiality" will be kept. On the other hand, do tap into the "grapevine" in a reasonable manner to avoid being taken by surprise by new developments. Define reality as it is and don't stick your head in the sand. Admonish others if, and only if, necessary.

26. Be extremely careful in crossing lines of authority or the organizational structure. Weigh the benefit to potential cost ratio carefully. You may suddenly be called on the carpet as previous “demerits” accumulate past the point of your boss(es)’ tolerance.

27. Don’t take yourself too seriously. It becomes easy to believe in “hype.” Aim for realism mixed with humility. Fleeting moments of publicity or being on top will pass. Be prepared for ups and downs and keep your ego contained within reality. On the other hand, you must occasionally and strategically “ring your own bell” but if overdone this can quickly irritate colleagues and make you “old news” with administrators.

28. Be sensitive about seriously outdoing your colleagues, either in reality or perception. Professional envy and backstabbing can do you in. Try to excel without being vain, obnoxious, or overly conspicuous.

29. Actively show loyalty to and do favors for your superiors and colleagues. A few instances of going above and beyond the call of duty can cement relationships for life. Earn trust, respect, and friendship. However, draw the line at requests for unethical favors or requests.

30. Do not take advantage of colleagues’ ignorance or lack of information without seriously considering the potential illwill. Information can be a powerful strategic advantage in organizational politics but should be used wisely.

31. Loner, introverted types should actively make an effort to occasionally “rubberneck” and visit with students, staff, and colleagues and, most importantly, to keep one’s superiors informed. A reputation for quietness can transform into a reputation for aloofness, which can transform into a reputation for snobbery and even incompetence. On the other hand, extraverted individuals must resist the temptation to spend half of their time drinking coffee and wasting everyone’s time in chit chat. Moderation is the key.

32. Be aware that as you become an “old timer,” the new, young faculty may be actively trying to outdo you in accomplishment, “territory,” or influence just as you may have tried to outdo the senior faculty when you were fresh on the scene. Be kind but assertive and, if they cross the line, use the “red hot stove” rule to put them in their place. Don’t tolerate unethical office politics; call their hand diplomatically but firmly. On the flip side, continue to defer and show respect to more senior faculty. Their favor can be invaluable.

33. Play as active a role as superiors will allow in the selection of all new staff and faculty. Screen, interview, and select very carefully. A mistake here can have serious ramifications.

34. Do not succumb to every fad and jump on every bandwagon. Develop a longer “time constant.” Don’t assume that just because some “educator” proposes some new theory or method that it will work for higher engineering education. Remember the “new math” and “television instruction.” Computers are here to stay in engineering education but they are only a tool. The chalkboard/lecture/question and answer method has been so well established for so long because it works so well.

35. Aim for integrity, consistency, maturity and creditability. Speak the truth but speak it as kindly as possible. Don't fall into the trap of a "political correctness" for its own sake unless its tenets are clearly based upon reality.

36. Pace yourself for continuous, moderate levels of effort with occasional bursts of more intense effort (often in response to specific needs, opportunities, crises, or deadlines). The continuous, intense, all-consuming efforts should be reserved only for the first five or so years as one seeks tenure and, even then, it must be balanced with personal and family responsibilities and long term planning for the future.

37. Carefully assess the long-term significance of all activities to which you commit. How will their activities positively affect others (and your own) life? Are they "exercises in futility?" Will their "maintenance" aspects end up doubling or tripling the time required to keep them running? In particular, choose committee responsibilities carefully. Serve on committees for which your perspectives and interests are relevant. Don't be a time wasting "square peg in a round hole."

38. Remember that, in a sense, you're in your position because your superiors thought you could make their job easier, contribute to their and the university's "mission," and even make them money (or general Academic Wealth in a broader sense). Balance your aspirations with those of superiors and, as much as possible, integrate both toward common goals and accomplishments. Too many instances of going off on your own tangents can lead to trouble if the boss isn't sympathetic. Don't downplay the economic reality of a university. No, it's not a "normal" business but economics still have a controlling influence. Within reason be as "frugal" as possible; "do the best you can with what you have."

39. Remember that the primary mission of a university is to teach students, not only specific knowledge but also how to live as a moral, ethical, and productive human being. Try to have a deep, lasting, positive impact upon your students, not only by your words but also by the example [15] that you set in all areas of life. Don't forget that they watch and analyze carefully. If you make this an overriding premise of all you do, it is likely that someday, they will come back and "arise up, and call (you) blessed" (Proverbs 31:28) [16]. This would be the ultimate compliment to a successful engineering education career of Academic Wealth and Academic Balance.

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Biography

Dr. **ROBERT D. ENGELKEN** was born on November 14, 1955 in Poplar Bluff, Missouri. He graduated from Walnut Ridge, Arkansas High School in 1974, obtained the B.S. - Physics from Arkansas State University in 1978, and the M.S.E.E. and Ph.D.-E.E. from the University of Missouri-Rolla in 1980 and 1983, respectively. He has been on the engineering faculty at Arkansas State University since 1982 and is currently a Professor of Electrical Engineering. He has been very active in research and development in the field of semiconductor thin films, with a major emphasis on utilization of undergraduate research assistants. He also has played an active/senior role in the development of the relatively young electrical engineering program at ASU and has been active in the field of engineering education, including several presentations/papers at previous ASEE/IEEE Frontiers in Education conferences. He has been active in ASEE, IEEE, the Electrochemical Society, the Arkansas Academy of Science, the American Physical Society, and Sigma Xi. He is married and has two sons.

terms that are essential in all fields of engineering - for example, all engineers need to discuss dimensions and tolerances, know the names of common materials, and describe how components are fitted and fixed together. language for discussing and applying key engineering concepts - for example, stress and strain, work and power, and fluid dynamics. The right-hand page has exercises which allow you to practise the new language and improve your understanding of how it is used. The Over to you activities at the end of each unit (see opposite) are discussion and/or writing activities. We need a view -from above shewing -the general arrangemerrt. of all of iine roof panels - a plan of -the whole area. J. Engelken, R. (1997, June), Long Term Optimum Strategies For New Engineering Faculty: A View From A Decade Down The Road Paper presented at 1997 Annual Conference, Milwaukee, Wisconsin. 10.18260/1-2--6669. Download Citation. APA - LaTeX bibitem. \bibitem{asee_peer_6669} Engelken, R. (1997, June), \emph{Long Term Optimum Strategies For New Engineering Faculty: A View From A Decade Down The Road} Paper presented at 1997 Annual Conference, Milwaukee, Wisconsin. 10.18260/1-2--6669. Download Citation. New Methods for Quantitative, Long-Term Policy Analysis. Robert J. Lempert Steven W. Popper Steven C. Bankes. Prepared for. This research in the public interest was supported by a generous grant from Frederick S. Pardee to develop new methods for conducting longer term global policy and improving the future human condition. B.1. Performance of Safety Valve Strategy over a Landscape of Plausible Futures Using the World Green-HDI Measure . B.2. Optimum Strategy over a Landscape of Plausible Futures . 105. 107. This report views long-term policy analysis as a way to help policy-makers whose actions may have significant implications decades into the future make systematic, well-informed decisions. The UN Decade on Ecosystem Restoration aims to prevent, halt and reverse the degradation of ecosystems on every continent and in every ocean. It can help to end poverty, combat climate change and prevent a mass extinction. It will only succeed if everyone plays a part. Find out more about ecosystems and the UN Decade, and join the global movement to restore our world. About the UN Decade. Learn more. Strategy. Learn more. Types of Ecosystem Restoration. View. Long-term innovation management "The balanced innovation card in interplay with roadmapping. Chapter. Jan 2013. In particular, [3][4][5] show the results of structuring the road map areas and objectives in the system of "technology -products -market", as well as the variants of graphic representation of the road map components. In [6], the specified system was considered at the level of a multi-product company level and the approach to harmonizing road maps for different products, markets and technologies was presented. Paper [7] focuses on the visual representation of a road map. Paper [7] focuses on the visual representation of a road map.