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Successfully Publishing New Technology-Level Text Materials

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Abstract:

This paper explores why Engineering Technology (ET) courses – especially upper division – have few level-appropriate textbook options, & what can (& can't) be done about it. First, ET is defined vs. its more theoretical & practical counterparts. Next comes why ET's small number of majors (vs. other STEM subjects), & confusion in how the word "Technology" is used, have kept publishers out of the ET market from its inception. Then: how five "game-changing" events in publishing & academia further decreased ET text choice, with greater impact (& felt sooner) in Junior/ Senior-level courses. Various solutions to the resulting scarcity of text choices (persisting to this day) are next evaluated, with reasons why collective actions by ETD would likely produce the best results. Finally we explore what a would-be ET-level textbook author should consider in deciding if it's worth writing a textbook & – if yes – how to maximize his or her odds of success.

I, What "Engineering Technology" Is & Why So Few Textbook Choices

Let's define Engineering Technology (ET), in contrast to what it isn't: it's not Engineering or Industrial Technology or Technician study. ABET's website compares ET & Engr. thusly:

> "Engineering programs often focus on theory and conceptual design, while engineering technology programs usually focus on application and implementation.
>
> Also, engineering programs typically require additional, higher-level mathematics, including multiple semesters of calculus and calculus-based theoretical science courses. Engineering technology programs typically focus on algebra, trigonometry, applied calculus, and other courses that are more practical than theoretical in nature." [1]

Engineering Technology is a young discipline, emerging as distinct only after World War II. Engineering became increasingly theoretical as atomic & transistor advances needed more Ph. D researchers, widening the gap between Engineers & Technicians; but industry needed practically trained professionals – like pre-war Engineers – stronger in math & systems than Technicians.

Certain colleges started ET programs to meet this "in between" need: Oregon Tech & Southern Tech (now Southern Poly) did so after being blocked from offering engineering degrees by another university in their state; Purdue & Texas A&M added ET to an existing engineering school; other colleges, both 4 & 2-year, started new ET programs where no engineering existed; & still others offered a combination of ET & Engineering in one department. Some "4-year" ET programs (e.g., SUNY College @ Buffalo; Arizona State U.) are "plus two" programs (Junior/ Senior-level only), relying on nearby community colleges to teach the first two years.

From the beginning, ET has often been viewed as a "step-child" (not universally accepted) of/ by Engineering -- both within the academic community & by textbook publishers – despite ETD being ASEE's largest division (historically about 25% of ASEE's membership) – because:

a) U.S. Bureau of Labor Statistics' "Standard Occupational Classification" database only lists Engineers & Technicians; *only* in health occupations are "Technologists" listed. [2]
b) ET has far fewer programs nationally: 100 4-year colleges & universities in the U.S. offer ET (per ASEE) vs. 350 in engineering, [3] most being ABET-accredited. Of 104 ABET-accredited 2-year ET programs, over a third are at those same 100 4-year colleges. Most original (1950's) 2-year College ET programs were in Mid-Atlantic & Great Lakes states.
c) The average ET program enrolls fewer students than the average Engineering program; also, each Engineering School has more recognized or accredited programs (usually several) than each College with ET programs (often just 1 or 2 accredited ET programs, with few offered anywhere beyond Electrical, Mechanical or Civil ET). [4]
d) Are Engineering Technologists "Engineers"? Some states allow ET's to earn the PE (Professional Engineer) credential by passing the Fundamentals of Engineering (FE) exam; most states don't allow it, or require petitioning the state licensing board (after X years of practice), & most are denied. Yet, though few ET's ever earn their PE, ET's still study Engr. Economy from an oversized text geared to engineers taking the FE exam. [5]

Why, besides smaller overall enrollments, have engineering-level texts predominated in the great majority of ET upper division courses, as in the Engineering Economy example just given?

a) Junior/ Senior-level students are expected to use calculus & learn design vs. just systems (though ET graduates rarely do actual designing); thus engr.-level texts often fit "as is."
b) Many programs – especially at rigorous "Engr.-in-all-but-name" programs like OIT & Southern Poly; or combined Engr./ ET programs, or "plus two" programs – don't really need a simpler text. Yet *less rigorous* ET programs (students struggle in math, even if "watered down") don't dare risk ABET accreditation by using a *Technician*-level text.
c) Since junior/ senior-level enrollments in ET have always been modest vs. freshman/ sophomore (3,000 per year per course for mechanical/ civil in U.S. & Canada [6] at the peak [early '80's]; & 6,000 in electrical, counting DeVry – vs. 10-45,000 freshmen), few publishers saw profit in upper division ET titles, especially when Engr. titles were used.

By contrast, ABET-accredited ET programs at community colleges have always needed their own dedicated titles, because while ABET requires ET majors to take calculus, it's taught later (second term sophomores) vs. Engr. majors (first term freshmen), thus calculus-based Engr. texts don't work. Also, enrollments in freshman & sophomore core ET courses were high enough – at least prior to the mid- 1980's, & especially in Electrical Engr. Tech, Tech Math & Tech Physics – to provide good profits for ET-level textbook authors & publishers already in the market. [7]

Despite some overlap & confusion, the line between Engr. & Engr. Tech has still been clearer than between Engr. Tech & "everything below it." The term "Technology" has been applied to such a broad category of programs "above technician level" that ABET-accredited ET programs have insisted on using both words together – "Engineering Technology" – for clarity. Yet many programs, unrelated to ET, have been renamed "Technology" or "Engr. Technology" since 1990, while neither seeking nor meeting ABET accreditation standards. Many such "new" Technology

programs are at ATMAE schools (formerly NAIT) – such as at Ball State U (IN), Millersville U (PA) & Bowling Green State U (OH) – that traditionally trained "shop teachers" & industrial supervisors. ATMAE only recently stopped *prohibiting* members from using "technology" in program names – unless immediately preceded by the word "industrial" – & now *encourages* its use. [8] Other technical education groups (secondary & post-) have also added "technology" to their titles since the late 1980's – when secondary school "shop" was renamed "technology education." Ironically, that latter term is now also obsolete, replaced by "STEM Education." [9]

Most post-secondary "technician-level training" institutions have also renamed themselves since 1990, [10] both public (school district, career center or college) & private – moving from "technical institutes" to "technical colleges" (GA, MN, WA, WI) or "__ College of Technology" (TCI College of Technology in NYC, formerly Technical Careers Institute/ RCA Institute; Dunwoody College of Technology (MN), ex-Dunwoody Institute). Some tech institutes got absorbed by nearby Community Colleges. The name change reflected new transferable Associate's Degrees vs. terminal Certificates (adding Math, English & General Ed.) – but a result was more word/ name confusion, as hundreds of "Institutes" were now called "… College of Technology." [11] [12]

Beyond education, the National Institute for Certification in Engineering Technologies (NICET), formed in 1981 by merging two prior groups that certified individual technicians (70,000+ by 12/31/84) or technologists (600- by 12/31/84). Yet, though technologists *weren't even 1%* of total members, "Engineering Technologies" still got chosen for their new combined name! Thus are Technology & Engineering Technology used (& misused) so widely that confusion reigns. [13]

II, Why Five "Major Events" in Publishing & Academia Further Limited ET Text Choices

A key premise of this paper is that ***five "big events"*** – three on the publishing side; two on the college side – resulted in reducing the availability of textbooks in ET quite dramatically over the past 30 years (since the mid-1980's), even though two of the five (both on the publisher side) occurred years earlier & affected other academic disciplines earlier & more heavily than ET.

From the early 1950's through the early 1980's both academia & textbook publishing expanded greatly. As Engineering Technology emerged as a distinct discipline (neither engineering nor "shop"), explosive growth of college enrollments in *all* disciplines occurred. Existing colleges & universities expanded, while new ones were built right through the 1960's (& some after); two-year colleges formed & expand through the 1970's. [14] Pre-WW II text publishers expanded their offerings in just about every discipline, & several new textbook publishers started – Prentice-Hall alone launched & then spun off Allyn & Bacon, Charles E. Merrill's College Division & Reston. By 1975, 30 distinct U.S.-based textbook publishers had post-secondary level titles. [15]

Many Engineering-level publishers – Prentice-Hall, Macmillan, Wiley, HRW – "dropped down slightly" to sign & publish Engr. Tech titles when they found willing authors. Technician-level publishers – McGraw-Hill (Gregg Division), Glencoe, Goodheart-Willcox, ATS (later ATP),

Bennett, McKnight & Delmar – didn't raise their level, but increased sales at 2-year colleges & "industrial technology" (NAIT) level 4-year colleges, complementing their traditional school district & area vocational school clients. Technician-level texts were priced lower than engr.-level texts of comparable length & complexity (ET titles in-between), but low production costs (mostly black & white, just an instructor's manual) & few used books allowed waiting 5-6+ years to do new editions, so even moderately successful titles in low enrolling fields made money. [16]

Yet early during this "onward & upward" euphoria came the ***"first big event"*** to alter textbook publishing: the rapid disappearance of traditional book publishing as it had existed for a century. Separate family-owned small businesses – publishing books that "mattered" to fill previously unmet needs; & that treated their authors & employees as "family," while still seeking to make a profit – were bought up as "good investments" throughout the 1950's & '60's, often by unrelated industries – high tech companies like Raytheon (D. C. Heath) & IBM (SRA); & manufacturers such as Bell & Howell (C. E. Merrill). Everyone continued making money, added new sales territories, etc., so this change in the relationship authors, editors & adopting professors had with their texts' publisher/ owners – from a personal "you matter to me" to an impersonal "it's just business" attitude – didn't seem so important at the time, but would by the mid-late 1970's. [17]

By the late 1960's, two college publishers dominated in "technology" – Prentice-Hall in Engr. Tech (NY, East) & Gregg-McGraw-Hill at the high technician-to-unaccredited-technology level (Calif., rest of US). In each case, their market "leader" was a DC/AC Circuits text – Jackson for PH, (> 25,000 copies/ year); Grob for MH, (40-60,000 copies/ year). [18] Electronics/ Electrical enrollments have always had the highest tech enrollment at all levels, thanks to proprietary "chains" like DeVry (only ABET-level ET proprietary school until the 1980's). [19] In the 1960's-70's, other publishers (especially Charles E. Merrill, but also SRA, Wiley, etc.) assigned editors to acquire new ET-level texts, due to: decent enrollments (especially in electrical/ electronics ET); few used books (even modest sellers did well in years 2-5 of an edition, as nearly all students were majors who kept their intro books for later reference); low cost of entry (mostly black & white books with an IM & maybe a profitable lab manual; no "gee whiz" image features vs. good problem sets & some attention to numerical accuracy) & limited competition. [20]

The second "big event," a change in college textbook publishing strategy in the mid-1970's, was actually a direct result of the *first event* (publishers owned by large corporations). [21] The CFO's of publishers persuaded their college text "units" to discontinue supplemental readings & small enrollment advanced texts (anything not selling 4,000 copies first year) – that had served their core disciplines "top-to-bottom" – in favor of publishing more introductory textbooks for large enrollment courses in more disciplines. It was a great financial strategy: print 10,000 copies of a big market text twice a year to get 12 times the annual ROI (return on investment) vs. print 5,000 copies (3-year supply) of an advanced text. But it was a PR disaster! Short term, it alienated professors & students in advanced courses; longer term, it unleashed a vicious cycle: rising costs, price increases, more used books & fracturing of prior long-term loyalty to a given publisher. [22]

Technology publishers (ET & otherwise) were mostly able to postpone for a decade the profit squeeze college text publishers in other disciplines experienced as the unintended consequence of this switch to big market books – especially freshman/ sophomore-level texts – because:

a) Technology was still viewed, even within educational publishing, as "less than": most sales were at 2-year & proprietary schools; & its successful authors often lacked Ph. D's.
b) Text price increases accelerated for *all* texts – as publishers tried to recoup the cost of adding extra "bells & whistles" to intro texts. [23] This benefited tech publishers, as their prices went up also, but their costs didn't, since their "intro" courses drew majors (not general ed.) & had small enrollments – thus publishers seeking new high volume intro markets passed it by, while practical students & instructors didn't respond to "sizzle." [24]
c) Used books – long a nuisance to publishers – became a bigger business (& problem) as: (i), book prices rose faster than inflation; & (ii), professors sold their proliferating intro-level exam copies (not kept as reference vs. advanced texts) to free-lance "book buyers." Publishers reduced revision cycles from 4-5 years to three, & overprinted "do not sell" on covers, adding to costs. But tech titles weren't affected at first as: still kept for reference; small enrollments per course discouraged buy-backs; 2-year college stores sold few used books anyway; & proprietary schools only sold new books (some even as part of tuition).
d) Second term sophomore-level courses in ET had at least half the enrollment of first term freshmen courses, as both were required courses for ET majors (no general ed.), so any drop resulted from the usual high attrition rate typical in Associate degree programs. [25]

Rising prices initially didn't affect upper division ET title availability at 4-year colleges either (weren't many anyway), but the publishing philosophy resulting in fewer small market titles sure did! Annual enrollments were 3,000 to 6,000 in N. America *at most* for almost all upper division ET courses – *including* proprietary school (DeVry) & Canadian technical college students. [26] So when publishers stopped approving proposals projecting first year sales of fewer than 4-5,000 copies – even though (i) technology title sales continued to hold up well in Years 2-5 (unlike most disciplines), & (ii) short black & white titles were cheap to produce & print compared to the price they commanded – even mid-level ET titles stopped being signed, especially at McGraw-Hill, where a "hard" minimum of 5,000 first year sales unit rule was imposed on all editors' text proposals. [27] A further rule made that threshold really impossible: the Sales/ Mkt. Director would not approve new text proposals projected to capture over 25% market share! [28]

The ***third "big event"*** that ultimately limited the availability of ET textbooks even more – this time coming from colleges, rather than publishers – was the purchase or lease of many major on-campus bookstores (especially in the Northeast) to two major bookstore "chains," Barnes & Noble, & Follett, starting around 1980-81. Suddenly used books became an even higher percent of total book sales, as books were moved from campus to campus. Publishers saw a dramatic sales drop in the first year B&N took over a store, because rather than waiting until January (after fall term) to return unsold new books, B&N ordered at the last minute, & returned unsold

copies mid-semester, *only then* paying the publisher's invoice (minus returns)! [29] By the 1990's, students at major universities bought mostly used books, even for mid-upper division ET courses (as well as Engineering). [30] Since the only way upper division titles could "pay for themselves" – given limited market size – was for a publisher to recoup its investment over several years (vs. first year or two in larger markets), the loss of sales in years 2-5 became one more deterrent to putting out new – or even revised – advanced course titles! With a high percent of 2-year ABET-accredited ET programs clustered in the Northeast U.S., even freshman/ sophomore book sales saw a similar (though less dramatic) decline after the first year; ET publishers responded by moving their profitable 2-year-level electrical ET titles from a 4-5 to 3-year revision cycle. [31]

The *fourth & fifth "big events"* both occurred at about the same time – the mid- 1980's – & have persisted as reasons for few new ET text choices ever since. As with the third big event – college bookstores being taken over by chains – the ***fourth "big event"*** also took place on the college side: a huge drop in enrollments in Engineering Technology – & nearly all other Technology &/ or Technician-level programs as well. It started in earnest in the mid- 1980's, & never really recovered. Here's how it happened & why technology enrollments (& text sales) are still down:

(1) Changing Demographics & Student Interests Hurt Technology Enrollments After 1980: During Higher Ed's post-WWII expansion, enrollments *went up* ***even more*** during recessions, as would-be job seekers stayed in school. College publishing was counter-cyclical – its best sales & profit years came during recessions (1974-5; 1981). [32] Overall enrollment growth – especially at the 2-year level by the late 1970's – masked fluctuations by major (Engineering was an exception – its well-known boom/ bust cycle led to half the number of Engr. majors at the "trough" vs. the "peak.")[33] College publishers had predicted a sales drop after 1982 (last baby boomers turned 18) but enrollments (& texts sold) still grew (albeit barely) – thanks to older students returning after being laid off or not promoted. What they didn't predict was a *big shift in the choice of majors*: 1980's students – especially older ones – were pragmatic, seeking "practical" degrees in better-paid fields, much less idealistic than their '60's & '70's counterparts. Business School enrollments soared; "change the world" fields (Social Work & School Teacher) fell. [34] Initially, ET programs benefited – especially in Electronics & Energy (oil & gas). But then many traditional technical jobs disappeared – partly *despite* & partly *because of* the personal computer age, even as the economy improved overall. Would-be ET majors, seeing recent graduates not find jobs, shifted to software (programming) over hardware. Meanwhile, those "good with their hands" (& ears) who'd have previously chosen automotive or manufacturing careers, now needed to learn how to read & apply computer schematics just like their more abstract-thinking electrical/ electronic tech peers. So while engineering enrollments rebounded again after the "tech" recession of the early 1980's, as they always had before, technology & technician enrollments never did. [35]

(2) Changing Government Support for Higher Ed. & Technical Education, Coupled with Changing Societal Attitudes, Made It Worse: Flat college enrollments, coupled with electorate pressures to cut taxes (i.e. California's Prop. 13), led many state governments to flat fund or even

reduce public college subsidies. First cut: programs with high equipment expenses & few majors, e.g. Mechanical ET & its technician-level Machine Tool cousin. Many 2-year tech programs were either discontinued or became evening only, staffed by adjuncts. Connecticut's State Technical Institutes (all had ET) were eliminated, folded into nearby academic community colleges. [36] Other factors: (a) changing societal attitudes & fewer teens familiar with machines; (b) fewer U.S.-based mfg. & union jobs in general since 1980 (& especially 1990); (c) fewer freshmen had ever seen a machine shop – or worked on the family car; (c) fewer teens sought "dirty" jobs as a factory line engineer (or skilled tradesman), even if well-paid; (d) increased pressure by government officials to shift funding from vocational to academic fields. [37]

This big decline in technology & technician-level majors – to fewer than half or a third of prior freshmen & sophomore numbers – deterred publishers from offering new texts – or revisions – in "below engineering" courses at *all* levels. Intro texts that sold 10,000 copies first year in its prior edition might only sell 4,000 next time. Mid-level text proposals that won easy approval when projecting 4,000 sales units first year was realistic – would now be rejected, as only 1500-1800 first year units could be justified. Even well-known classics that *dominated* a small market weren't revised. Approval for any new project in that size course became virtually impossible. [38] Would-be authors were discouraged, too: obviously, fewer students meant lower sales & thus lower royalties (only partly offset by rising book prices); & publishers turned more proposals down; but less obviously, college budget squeezes meant ideal author candidates (full time day instructors) had more responsibilities (only full-timer in dept., doing adjuncts' lesson plans) or lost their job (for long hours, no summers off, back in industry), leaving no time to write a book.

The biggest ET decline was at 2-year colleges. Junior/Senior-level ET enrollments also declined *per program* at 4-year level, but **the *number* of accredited ET programs has *increased***, since 1990 especially – at *both* 2 & 4-year colleges. Some 2-year colleges replaced several technician-level programs with a single ET-level program. [39] As noted earlier, ATMAE colleges renamed their programs "technology" or "engr. technology," & increased course rigor. Several proprietary chains besides DeVry offered ABET-accredited ET degrees, as well as upgrading technician-level Certificates into granting Associate's degrees. [40] Also since 1990, many 4-year colleges added ET graduate degrees (Masters' & Ph. D). So while ET upper-class markets were already small (3-6,000 per course) & *dropped even lower* after 1985; it was less than in 2-year programs. Thus fewer majors per program were partly offset by an increase in the number of programs. [41]

Textbook publishers overlooked this steady *increase* in the number of accredited ET programs! The author attributes this to the ***fifth*** & final ***"big event"*** that limited ET text choice: reduced competition due to consolidation/ merging of educational publishers (College & K-12), starting around 1980 & continuing for the 30+ years since. The mergers came in response to the *"third/ fourth events*" (college store chains/ fewer students), during big financial/ technological changes: declining middle class incomes; rising energy costs; "stagflation"; & first personal computers. But it's the "*first two* (publisher-driven) *events*" that drove merger decisions: just as growing

sales had fueled corporate buying of text publishers in the 1950's & '60's; & the intro book shift of the 1970's dampened enthusiasm as costs & book prices went up while profits shrank; now the "impersonal" corporate owner/ investors demanded a return to profitability – or they'd sell! [42] [43]

Who merged with whom/ when isn't important. Here's how mergers affected ET text choice:

1) The 30 college publishers of 1975 are now down to 6-8, only two of which (Pearson/ Prentice-Hall & Cengage/ Delmar) publish *any* true ET-level titles.
2) Pearson/ Prentice-Hall has the only true ET list, after acquiring its key competitor, C. E. Merrill via Macmillan; absorbed Reston (which it already owned); & Addison/ Wesley [44] (Benjamin-Cummings). Other occasional challengers (McGraw-Hill & Wiley) withdrew due to enrollment declines, company policies, or to pursue bigger post-merger markets.
3) Despite its dominance, Pearson/PH has not released a new standard major subject ET title (EET, MET, CET) *above the first year level* in at least a decade. They do revise ET titles that dominate their markets (Boylestad in EET; Mott in MET; Washington in Tech Math), & "crossovers" to/from Engineering or non-ABET Technology/ Technician-level.
4) Delmar (Cengage) was always technician-level, dabbling (at best) in ET-level; few if any Junior/ Senior ET titles. Purchase of West's & Harcourt's College Div. eliminated two emerging ET alternatives. Economically unstable (high debt) since Thomson > Cengage.
5) Third of the "Big 3" college publishers, McGraw-Hill, *never* had a strong ET list (much stronger below-ABET Technology & Technician), despite sponsoring ETD/ ASEE Harold McGraw award dinner. Even technology/ technician list has shrunk. Parent Co. sold Educational Publishing Div. (original core) to Apax in Nov. Only <u>*big two*</u> soon? [45]
6) Other tech/ET text publishers in '70's now merged out: SRA; Holt RW & Bobbs-Merrill.
7) Only four *technician*-level Pub.'s remain: Delmar, PH, Goodheart- Willcox & ATP.
8) While fewer Engineering publishers remain also – Macmillan, Holt, Harper, Houghton, Harcourt & West were merged away – yet Oxford & Cambridge U Presses; plus Elsevier & CRC Press – though technically not textbook publishers – do publish key Engr. texts!
9) Editors & sales reps dismissed by mergers led to "loss of institutional memory." Authors of modest selling titles in markets the merged company already dominates suffer most: editors re-fight old battles; ignored by sales reps; less likely revised > less competition.

While this author contends that the preceding five events caused today's dearth of new ET-level textbooks, *other factors* (especially since 2000) *have prevented recovery*! The "counter-cyclical" sales increases that once benefited text publishers didn't occur during the 2007-8 recession, as:

- <u>Digital online textbooks</u> for laptops, e-readers, I-pads (& even I-phones) raised costs for publishing big-market (intro) texts yet again, [46] yet aren't offered in most small markets (i.e., upper-division ET): too few copies for bookstores or publishers to be bothered! [47] How about doing an online or CD-ROM-*only* text for a small market needing full color illustrations that can't be done cost-effectively in print? So far it won't fly: there isn't *any* textbook market in *any* discipline where a digital-only text has been widely successful.

- Alternative editions/ versions: As with Cherry Coke™, Diet Coke™, Zero Coke™, etc., the more "editions" a publisher creates to capture sub-sets of a market (quarter courses, added problems, different binding wanted), the more sales are Balkanized. [48]
- Custom publishing – consecutive pagination seamlessly blending a prof's own materials with chapters of different texts by the same publisher – are now possible per new digital pre-press processes that lower production costs. But as with alternate editions, increased choices (for the same book) result in fewer economies of scale in printing (mfg.); usually isn't in color; & has at least a 300-copy minimum; so small market courses needn't apply.
- Growth of "rental" textbooks: as with digital, alternative & custom editions (& used books!), the new "rental" craze just raises publishers' costs (more used books, fewer new books sold), thus raising (not lowering) book costs; plus it's another intro-only option. [49]
- The advent of Amazon.com as a competitor to the campus bookstore, helped push college stores into giving bigger discounts & adding book rentals. More than above, this affects ET sales, which in turn may discourage new publishers from entering the ET market. [50]
- Online, students can legally buy "International Student Editions," discounted versions "not to be sold in North America." Just this year (3/19/2013), "The (US) Supreme Court ruled … that textbooks and other goods made and sold abroad can be resold online and in discount stores without violating US copyright law," despite college stores & professors objecting otherwise. As tech books "travel well" (sell abroad), it's a problem in ET! [51] [52]

III, Pros & Cons of Various Possible Solutions to Dearth of Current ET-level Textbooks

This paper has outlined the reasons – especially low enrollments & publisher mergers – for the scarcity of Engineering Technology texts with current copyrights – especially mid-to-upper level texts in mechanical, civil, manufacturing & industrial mgmt. ET courses – to show textbook publishers' constraints, strategies & thinking, so ETD can evaluate the merits (pros & cons) of various proposals for solving this problem realistically. Given this author's long involvement in ET publishing, each proposal has a disclaimer as to the author's "bias" or "stake" if it's adopted. The first 10 ideas are offered as suggestions ETD should consider doing *as a group*: [53]

1. Develop a list of all ET courses nationally at Sophomore to Senior levels (by discipline, EET, MET, CET, etc.); determine annual enrollment for each & which courses have & do not have a good text – & if an Engr.-level dominates, is there a need for an ET-level text? *Pros*: Must happen before ETD can, as a group, make any requests of publishers (#2-8). *Cons*: It will require time & effort on several people's part to put this data together. *Disclaimer*: Paper's Author (PA) benefits personally from this data, & he'd help get it.

2. When #1's done, ETD asks ET's leading publisher, Pearson/ PH, to commit to publish for the missing "holes," even for markets with as few as __ students (1,000? 1,500?). *Pros*: Would solidify PH's #1 status (publishers prize in any market); do revise 2,000-copy Year 1 sellers; superior sales organization; most stable of big 3 (vs. merger, change)

Cons: Enhances existing monopoly, discourages competition; high text prices; too many technical errors (weak QC); acquisitions editors overloaded & turn over too frequently.
Disclaimer: PA's most successful authors [54] at C. E. Merrill are key strengths of PH list; PA has "underdog" bias; biggest battles PA had in signing authors as editor were vs. PH.
Note: For ideas 2-8 (asking publishers to commit to publish upper level ET), ETD should decide on strategy in advance: approach one publisher at a time – or all at once (if the latter, take the best offer?); or split it up by discipline (one publisher for Mechanical, another for Civil, etc.); also, is the commitment "exclusive," "in writing," "as long as…?"

3. … ETD asks ET's most viable challenger (to Pearson/ PH), Cengage/ Delmar … (same).
Pros: Hungrier (Avis™ of ET publishing); also will revise 2,000 copy Year 1 sellers.
Cons: Unstable Parent (huge losses, difficulty absorbing mergers); heavy staff turnover; frequent structure changes; too many text errors; sales/ mkt. set-up poor – 4-year reps rarely work Delmar titles; *much* stronger at technician-level (their real focus); high prices
Disclaimer: PA witnessed low respect for people – employees at all levels ("everyone's expendable"), authors & customers – when at Delmar (then Thomson; still at Cengage per friends there). When West College titles were "merged in" in 1996, West's entire STEM group was dismissed & titles shipped off, eliminating all institutional memory. [55]

4. … ETD asks McGraw-Hill Higher Ed. (sponsor of ETD's McGraw award) … (same).
Pros: Have sponsored McGraw award for decades; high quality texts (good QC)
Cons: Never strong in ET, now mostly withdrawn from tech markets (high first year sales minimums?); Parent Co. sold Educ. Div. 11/12 to Apax. Too many missed customers during sales force changes: T/T to Gregg to Glencoe to Higher Ed.; now again?
Disclaimer: PA did developmental editing & sales for Tech titles as free-lancer '00-'04; not hired post- MH interview 5 years prior. PA found it sad when a great company killed a great tech list due to very strict financial metrics (& high overhead?); & now sold off. [56]

5. … ETD asks other college text or engineering publisher (Wiley, Oxford/ Cambridge UP, CRC Press, Elsevier; or W.W. Norton, Bedford/ St. Martin's, etc.) … (same).
Pros: It never hurts to ask.
Cons: None of engr. publishers noted strong at 2-year level- key ET market (though less so for Jr./Sr. courses), & since Wiley published Hindhede (Machine Design) in 1984, no ET interest shown. Other publishers named have little or no presence in engineering or technology (vs. sciences, humanities, social sciences, etc.), so they're even less likely.
Disclaimer: PA knows CRC Press, Elsevier & Cambridge UP publishing philosophy enough (via friends or former affiliation) to know that below-engr. interest is near zero.

6. … ETD asks Industrial Press … (same). IP traditionally publishes professional references in Mfg. (not texts), but since '08 recession hit prof. sales hard, *actively seek* ET texts. [57]

Pros: *Good fit*, esp. MET/CET/Mfg. Targeting ET; low overhead so profit on 1k year-1 copies; low prices, yet high bookstore discount; veteran editors, even have ME on staff; above-avg. royalties; stress reference features> few used books; family owned since 1883
Cons: No US field sales staff (all phone); unknown outside Mfg./MET/CET; unsure if want EET or Ind. Mgmt. titles; weak digital versions (CD-ROM's vs. online for now)
Disclaimer: PA started ET push while at IP 2010-11, then as free-lancer, so PA could personally benefit if IP gets the "call" from ETD; + bias toward small family-owned Co.

7. … ETD asks one or more non-profit Trade Associations such as SME … (same).
Pros: SME already has strong publishing program, plus bought Tooling U. Non-profits usually willing to risk small print runs, etc. Other Trade Assn's: ASME; IME; ATMA
Cons: Trade Associations are limited to small slices of ET market – who would serve other parts? They also have no field marketing; weak reaching faculty decision-makers.
Disclaimer: Maybe some sour grapes because SME is so much stronger than Ind. Press. PA shocked to learn that strongest text sells under 1k/ year; ended co-publish with IP.

8. … ETD asks about being part of one or more *Momentum Press* "Collections" … (same).
Pros: A new concept without competition – 150-page "short" titles focusing on applied engineering concepts; because MP titles are (i) applied; (ii) aimed at Jr./ Sr. level course topics & (iii) not expected to sell more than a few hundred copies in each of print, digital & library database forms; sounds like a good outlet for meeting some ETD text needs. Stronger Intl. sales of digital format than any text publisher; unlimited duplication rights
Cons: While MP Collection titles are for "course study" they're technically not texts, thus little pedagogy (*maybe* problem sets in appendix); they're also short, unless for capstone or special topic course may require 2-4 & then expensive; dubious re willingness to do separate "ET level" Collections, though MP has ET-level Coll. Editors. Library sales #1.
Disclaimer: Along with Industrial Press, PA has MP agreement to find authors & benefits personally if placed there (even more if Collection Editor placed). Do not see MP as top answer to ET text problem, but ideal for those topics (subjects) with few students. [58]

9. ETD either decides to start its own publishing company, or "self-publishes" certain titles.
Pros: One can "control" every aspect of the process; don't need "approval" of Editor.
Cons: Does ETD (or an author) really want to be a general contractor, to do production, design, sales/ marketing, finding printer & binder, plus warehousing, customer service, etc.? Hiring these services takes up time better spent writing. Most self-published titles don't do well (selling tens or hundreds of copies at best); most lack digital options; even best self-publishers don't market to professors (vs. general public); ditto Amazon.
Disclaimer: Self-publishing is key PA competitor for authors in small ET markets. [59]

10. ETD develops digital-only texts (online or CD-ROM) for low enrollment courses.

Pros: Trade associations (e.g. American Foundry Society, SME) often publish CD-ROM only titles often for very small total orders (under 100). Illustrations can be full-color. *Cons*: Author has no financial incentive for life sacrifices made to write. As per prior section, last ¶, 1st bullet: no text has *ever* been widely adopted without a print version. *Disclaimer*: After going back & forth re print's impending demise at different points over past 30 years, PA has stopped trying to predict the future. Also, "no text … adopted without print …" is based on 2-year old data (last PA widespread college store visiting).

If ETD chooses not to act as a group, or if an individual would-be author would rather put together one's own text proposal independently of ETD, here's how PA would alter the pros & cons of ideas #2-10 for an *individual author* attempting to get published:

11. Author approaches Industrial Press, Pearson/ PH or Cengage/ Delmar directly with one's proposal to write a small-market ET text. They're the three most active in ET markets. *Vs. 2, 3 or 6 above*: For smaller course markets, PA suggests Industrial Press; for larger course markets (5-10,000 students+) PH or Delmar. First key risk: PH & Delmar likely to reject a proposal in course size smaller than corporate guidelines (per Section II & endnotes #18, 27 & 38), even if lower than McGraw-Hill's. Second key risk – true for all three publishers – is that negative peer reviews (which editors must get, as they are not content experts) will trigger a rejection! PA offers #15 below to prevent this (but see following disclaimer). Trade associations (SME, etc. per #7 above) would most resemble Industrial Press. Third risk: Small pub's (Ind. Press) won't risk high plant costs of intro. *Disclaimer*: PA offers a free service (to authors) to evaluate & "develop" technology text proposals *pre-signing* with IP. The PA financially benefits (publisher pays when a contract is signed) from this arrangement. This is explained in more detail in Section IV.

12. Author approaches another commercial publisher (MH, Wiley, Oxford, CRC Press) …. *Vs. 4 & 5 above*: Unlikely: publishers reject proposals for markets they haven't targeted. In fact, even before mergers, publishers sold "lists" (disciplines where they had marginal presence) to publishers stronger there, to focus marketing resources in core areas.

13. An individual author submitting a proposal for a Collection title directly to Momentum Press would likely have the same odds of success as going through ETD – see III8 above.

14. Author chooses to "self-publish" an ET text. *Same as #9 above*. Key differences vs. commercial publishers: Author assumes all the costs & risks a publisher usually takes on; Author spends a lot of time as "general contractor" vs. writing, even more if takes on additional roles (marketing, warehousing, customer service); usually no digital version. The biggest problem is that all self-publishing firms concentrate on the "trade" (general interest) market; they have no marketing capability in terms of sending professors free examination copies or displaying at conferences to encourage multiple copy adoptions.

15. Get "help" prior to submittal from (a) an agent, or (b) a "free-lance placement editor." *Agent*: For the pro's & con's of using an agent for a textbook proposal, *see Section IV #3*. *Free-lance Placement Editor*: To best of PA's knowledge, PA is only Placement Editor willing to tackle ET projects. *Again, details can be found in Section IV, item #3.*

So based on years of analyzing the ET textbook market, here's what the PA suggests:

- *ETD should put a group together to evaluate ALL courses offered in ABET-accredited programs at all levels* & in all disciplines: estimate annual enrollments in each & note if there is or is not a satisfactory ET-level text available in that market.
- *For larger text markets* – or in smaller markets where existing ET-level texts are OK as is, such as Mott, Machine Elements & Applied Fluid Mechanics – *ETD should do nothing*! A would-be Author inspired to write a new competitor should submit a proposal to Industrial Press, Delmar or PH – probably in that order – or better yet, see a "Free-lance Placement Editor" first (vs. going to the publisher), as established texts are hard to unseat unless new author can also match the leader's strengths! (Per IV3c & notes 68-70)
- Next, for *smaller text markets in ET without a satisfactory ET-level text, find out if an Engr.-level text is seen as satisfactory by the majority of the market*; if so, ETD (or individuals) need to decide if (again) a new text could *match* that text's strengths.
- Finally, for smaller markets in ET that do NOT have a satisfactory ET-level text & consensus is there is NO satisfactory text available, decide on a course of action:
    a) If the market size is really small (smaller than 1,000-1,500 (because even without competition, Industrial Press is unlikely to be interested), see if anyone is willing to write one or more Momentum Press short topical "Collection" titles. Or consider self-publishing or even digital-only publishing (though costs will out-weigh financial compensation for the effort, likely affecting quality of output).
    b) If it's an upper-level course (or even Sophomore-level in a lower enrollment field such as MET or CET) with likely annual enrollments of 2,000+, consider trying Industrial Press; Go through free-lance placement editor to maximize odds.
    c) If it's an upper-level course in EET or Industrial Management, it may be worth seeking to "negotiate" with a publisher in advance of submitting proposal. Due to all the mergers, there's unfortunately no counterpart of Industrial Press in either of these two areas (IP is ambivalent re entering) or one would be recommended.

Bottom line: ETD *must work as a group*: gather data & get at least one publisher committed to publish texts (if meet editorial standards) for agreed-upon small market ET courses of X size.

IV, Who Should Be an ET Text Author & How to Improve the Odds of a Text's Success

We've established there's a problem – few if any ET-level-appropriate texts – how it developed; & what ETD might do as a group to remedy the situation (though not easily). Now, let's examine steps would-be authors might take to improve their odds of success in writing such a text. [60]

First, let's define **success** as a textbook author. Here's how this paper's author defines it:

(1) Signing a fair contract (decent royalty %) with the "right" commercial text publisher;
(2) Having the final manuscript "accepted" by the publisher, & then get published;
(3) Selling enough copies that the text is not only kept in stock, but gets revised.

It is this long-time editor's opinion that #3 is most important. *A successful text is one that meets the publisher's expectations enough that a timely revision from the author is requested*.

What *all first-time authors in all genres of book publishing* face *are three sobering truths*:

(1) Most proposals are rejected by publishers; thus no contract is offered.
(2) Not all contracted manuscripts completed by an author are "accepted" for publication.
(3) Most published books *fail*. They don't sell enough copies to cover the publisher's costs.

When writing a text for a market like Engineering Technology – small to begin with; confusing to sales reps trying to distinguish ET from engineering, other technology & technician-level programs; then experience a sharp decline in enrollments that's not rebounded in 30 years; in which few publishers showed interest even *before* mergers greatly reduced their number; add to that the three truths that apply to *all* book publishing – & it becomes apparent why it's nearly impossible to convince *any* publisher to take on a project by a first-time (or previously not so successful) author to fill one of ET's "holes" (low enrollment courses lacking a suitable text).

Two years ago, this paper's author – seeing several ET-level courses without current texts – put together a list of what he'd done to "add value" to projects he'd edited in mutual collaboration with technology authors, resulting in a much higher than usual success rate for new ET titles. So he started a service for would-be technology authors – at no cost to the author! – to help *develop* technical text proposals (prospectus, table of contents, sample material) to submit to publishers – to raise the odds to be signed, yes, but also published; & not just published, but *successfully* so – that is, meet the publisher's sales forecast & profit margins, so a new edition would be requested. As a service to the field, the rest of this paper comprises the essence of these suggestions. [61]

1) The first question a would-be ET (or any) author should ask is, "Do I have the right *frame of mind* to write a successful ET textbook?" The following are this author's observations as to characteristics successful authors often possess – the more that fit you, the better: [62]
   (a) Your #1 reason for writing it is that *you really need a better text* for your students.
   (b) You have detailed opinions about other textbooks, & a *vision* for an ideal text.
   (c) You'd *hold fast to your vision* for your text, *yet welcome collaboration* & feedback.
   (d) Making money is nice, but writing this book would be more *calling* than obligation.
   (e) *Your dream is the creative process* (writing), not seeing your name on a book cover.
   (f) You intend to keep your day job (& treat any royalties as bonus/ annuity income).
   (g) *Writing a text* sounds *more appealing than consulting*, even for a less certain payoff.
   (h) *You're well organized* (in thought & in using space & time) & wish more texts were.
   (i) *You express ideas clearly* when you speak, teach, etc. – & *keep things simple*.

(j) *You show enough steps* when giving *example problems*, homework solutions, etc.
(k) You have a *"sixth sense"* as to where *some elaboration* will *avoid student confusion*.
(l) You insist on going over & over work to *get details right*, not losing the big picture.
(m) Your *peers & family* would *support* the idea of *you* taking the time *to write a text*.
(n) You can see yourself *writing a text as a hobby*, over doing home improvements, etc.
(o) *Students* often say that they *prefer your problems, figures, explanations* to a text's.
(p) You're *well-connected* with the key *market segment likeliest to order* (buy) the text.
(q) The *risk* of your proposal's *rejection* (or the book not selling) *is worth the learning*.
(r) Your *day job* is relatively *stable*, & you're not in line to be dean or dept. head soon.

Purposely omitted from this list is the #1 reason given by would-be authors for *not* writing a text: *no time*! While there are certainly better times than others – right after getting tenure/ promotion to full professor; or your last child just went off to college – while having too many irons in the fire or an ill parent can greatly limit writing time – *what matters most is* ***how high on your list of priorities is writing that needed text***, & would you be more *disappointed* or *relieved* if someone else "beats you to it"?

2) Is writing a text worth the effort? That depends: on your motivation for writing a text; how you define success or failure; what's a sufficient payoff (your expectations); & "opportunity cost" (what you could do instead). Here's more on financial considerations:
   (a) If your *#1* reason for writing a text is to make money, then yes, you are likely to be disappointed no matter *how* "successful" your ET book may be in the publisher's eyes, (*a very few* ABET-level ET textbook authors – mostly intro-level EET titles – have seen 6-figure royalty checks in a year). It's helpful to add in the "opportunity cost" of writing a text – what you could be doing with that time instead, such as consulting work – in deciding if writing "pays." So you *might have enough* financial incentive – if your expectations are realistic – that with the *other* reasons you are writing a text, you'd have enough motivation to carry you over inevitable troughs.
   (b) The good way to treat potential text income in small markets (junior-senior level or any mechanical/ civil title), is as an *annuity*! Any technical text author expecting to recoup the time invested from *first edition sales (especially first year*) will usually be disappointed. [63] Yet while used books depress technical text sales more than before, they still hold up much better in subsequent years (especially 2nd & 3rd years of a first edition "winner," picking up new adoptions via word of mouth) than other subjects, even engineering. Let's look at a realistic (conservative) forecast for sales & royalties for a hypothetical 350-page junior-level ET text from Industrial Press *(1st example)*: [64]

Net price of $61.75 (.65 of list price of $95; comparable engr., $120/ 92.40 net)
Author's royalty rate of 12.5% of $61.75 or $7.72 per copy
If sell 1350 copies first full year, that's $10,400 in author royalty first year
If sell an additional 3500 copies over next four years, that's $27,000 more royalty

So over 5-year period, average royalty would be just under $7,500 per year.

Take the market by a storm – as Bob Mott's texts in Fluid Mechanics & Machine Elements have (see notes #6 & 62, etc.) – and these royalties may double (or triple/ quadruple, with a higher royalty rate &/or net price). Pick a larger, more popular course to pursue, & royalties could be even higher (or not, given more competition)! Even so, the *odds of failing are **always** higher than for succeeding*. The key to successful "annuity" ET publishing is to meet or exceed the publisher's expectations for sales – even if these numbers are modest, befitting a small market – thus in the long run, *you'd likely make out better selling fewer copies* first year for a small publisher who deems that sales number profitable, vs. initially selling more copies for a larger publisher (even on higher royalties per copy, perhaps due to a higher net price), but falling significantly short of the larger publisher's expectations (needing much higher unit sales minimums to be profitable)! Here's why (*2nd example*):

Small publisher sells 1,100 copies Year 1, vs. expected 1,000:
(List, $95, Net $61.75) 15% Royalty or $9.26 per copy = $10,189 in Royalties
Averages 975 copies sold Years 2-5 or $46,300 royalties over 5 years, $9260/ year;
Revised Year 6, averages 1,250 copies per year 2nd Edition, or $11,580 avg. Royalty
Large publisher sells 1,350 copies Year 1, vs. expected 2,500.
(List, $120, Net $92.40) 10% Royalty or $9.24 per copy = $12,474 in Royalties
1st Scenario: Sells another 1000 copies Year 2 before original inventory exhausted; publisher chooses to release (put Out of Print), no more royalties; so Royalties over a 2-year period is $21,714 or $10,857 over 2 years, or $4343 average over 5 years!
2nd Scenario: Same as 1st, except publisher writes off plant cost losses & reprints title; but ceases active promotion (just catalog) & neither revises nor releases. Author averages $8,500 a year in Royalties over first 5 years, dropping to $3,400 in Year 10.

Scenario #2 is more common, as publishers often break even plus on "*Manufacturing Costs*" by *reprinting* a "failed title" after writing off "*Plant Costs*" (production, design, pre-press & editing costs before first copy printed). Despite constant royalties (vs. none if "released"), this may be an author's worst outcome, & it happens all the time: the book sells enough to keep in print, but not revise or update; so the author's stuck, as no publisher will touch it without an "intent to release." Even if another editor shows interest (rare in ET: so few players), his higher ups will nix it, not taking a chance on another publisher's failed title, given so many failed titles of their own. [65] Scenario #1 (outright release & out of print) is more common when first year sales are *way below expected* (< 1/3rd); the problem then is several years' inventory before any reprint is needed; larger publishers often "remainder" these at deep discount to "get out" sooner. [66] So while a large publisher *may* sell more copies, as in the above example – with a bigger & more thorough sales & marketing operation – it also *may*

not, as small market titles are low priority. A small publisher – giving it more priority & promoting it harder – may sell *more* copies – by telephone, despite no field staff!

3) How should a would-be author proceed – find an agent; send directly to publisher; what?
   (a) College textbook publishers rarely use intermediaries to acquire titles: acquisitions editors compete over prospective authors with strong academic credentials (tenure; full professor; got their Ph. D – & teach – at the "right" school) to write yet another intro psych. text. But Technology Editors face unique challenges: authors don't need academic credentials (next "winner" could teach *anywhere* or be in industry). But as tech editors must manage the same sales $$ as counterparts in other disciplines, they handle way more titles (with less help) vs. peers & get overwhelmed – so finding time to prospect for new authors, return phone calls from existing ones (especially after a merger), or develop any but intro-level texts, is hard! So they may welcome the help!
   (b) Literary Agents get a percentage (typically 15%) of an author's royalties; if an author is never placed, *the agent never gets a cent*. Agents keep trade (general interest) book editors from being inundated with manuscripts in popular genres (many would-be authors). But text authors are rarer (as per 3a, fought over), so Acq. Editors, neither needing nor seeing many agents, don't trust or use them. Tech Editors' needs are different – good authors may be anywhere & writing texts can enhance promotion in ET/ Technology (vs. most STEM subjects, where only research funding & journal articles count), but agents are even *less experienced* in tech texts than the editor. [67]
   (c) Given (a) & (b), several engr. & tech publishers – including Industrial Press – now rely more on independent free-lance placement editors to find authors. As with an employment agency, an *author* (job applicant) *pays nothing* to be *signed; placement editor's fee* (employment agency's fee) *is paid* by the *publisher who signs the author* (employer who hires the applicant); & so as with an agent, no placement, no fee! It's a new position – a by-product of publishers' cost-cutting to reduce full-time staff. It works well in Technology, if a free-lance editor *also does* (pre-signing) *development* the pub's editor *never* has time to do; yet, *without development, odds of failure go up significantly*. [68] Most text publishers have heavy turnover, so most Tech acquiring editors lack experience – generally or in the peculiarities of market niches like ET. A free-lance editor (FLE) may bring decades of discipline-specific editorial experience in evaluating & developing ET manuscripts. After helping shape an author's rough proposal, FLE usually obtains a couple of peer reviews. Once reviews are OK, FLE adds a "prospectus" (see 4c below), with author input & submits the proposal to a selected publisher. [69] The "value proposition" a *good* Placement Editor offers is to increase the odds an author will be *signed* by the best publisher *for that project* & eliminate the most predictable causes for rejection. [70] A *really good* Placement Editor *also does "pre-signing development*," increasing *the odds of* ***success*** (sells so well it's

revised). Pre-signing development can keep a final manuscript from rejection for "not meeting editorial standards" (the dreaded *acceptability clause* in book contracts)! [71]

(d) If an author requests the proposal be sent to a publisher *unwilling* to pay the FLE's fee, then (& *only* then) the free-lance editor becomes an "agent" & the author pays a percentage of *royalties* – again, if no contract, no fee! [72] Many authors (most really good ones!) are reluctant to let anyone "fiddle" with their manuscript, afraid of loss of control. [73] A top-notch editor knows when to suggest improvements to a manuscript, vs. leaving well enough alone. The partnership between editor & author is like a well-choreographed dance, the author "leading" (*it's always the author's book*!). When an author says, "Well, I can make that change, but then it won't fit in my own course," a wise editor regroups, so that *doesn't happen*! FLE's aim is to expand a book's market, not change an author's vision! Yet the FLE knows when to say "No" to a "lone wolf" who - unwilling to hear reviewers or an editor - won't fix his fatal flaws (per #70).

4) How does a would-be successful ET text author go about preparing a winning proposal?

(a) A proposal helps a publisher decide if a project is worth spending money on – even to review! College textbook editors are not content experts, so they rely on paid peer reviewers to make signing decisions. Given level confusion (Engineering vs. ABET-accredited ET vs. ATMAE-accredited Technology, vs. unaccredited "technology," vs. ACTE/ ATEA/ NATTS "technician" programs), harried &/ or inexperienced editors often get reviewers from the *wrong type of program* (see note #73); the error can be compounded if the editor insists the author make changes a "wrong level reviewer" has suggested (not fitting the *reviewer's* course), but weaken the MS for its intended audience; even worse, the editor may *reject a project that fits the author's market segment just fine*! Those *peer reviewers* are the key audience for the proposal, especially sample chapter material & TOC. The key question to reviewers is, "If the remaining chapters are comparable to what's here, *would you adopt – in place of what you're using now*?" A good free-lance placement editor elicits "yes" responses – by picking good "preliminary reviewers" (before the publisher finds its own) & by suggesting key changes the author might make *before getting any reviews*. [74]

(b) As noted, a proposal has three parts: prospectus, table of contents, & sample material.

(c) The secret to *a good prospectus*: the author shows knowledge of the market – if FLE writes this part – *impressing the publisher*: *it is this part of a proposal* (vs. chapters, TOC) the editorial director, director of marketing, financial officer, etc., understand best. How does the author plan to *match the top sellers' strengths* & (again per #70) as well as (obviously) improving upon its weaknesses? Does the author understand marketing (selling, promoting) as to which niche(s) the title *best* fits & others it *might* fit? Can the author articulate an overriding "goal" (its *features* & how they *benefit* student or instructor or both)? Add in the author's CV & the book's spec's – final text length, number & type of illustrations, etc. Knowing the targeted publisher's quirks,

an author's FLE is prepared to counter objections likely to be raised during editorial board meetings that could "sink" an otherwise sound proposal (again, see note #70).

(d) The key to a ***good table of contents*** is good organization: show at least all #1 heads (the main sections within each chapter) for the whole book (not just sample material submitted), along with any planned appendices, etc. It helps also to list many (or all) #2 headings. Tech professors can often determine the "fit" of a text based on its TOC. It's expected that these contents will change somewhat as new chapters are written.

(e) The key to making a ***good*** impression with ***sample material*** is to ***show samples of all elements*** being proposed – so better one complete vs. part of five! Do one really well-crafted chapter (or even just *part* of a chapter) – with (samples of) all pedagogical elements included, such as illustrations (if some are missing, at least include a space for them, preferably with captions that reinforce the text's learning), problem sets (if more problems are planned, say how many & how they're likely to be graded for difficulty), chapter objectives, key terms, etc. – instead of 3-4 chapters missing major elements planned. Include the chapter *that you would most want to see* if reviewing someone else's MS – perhaps the area that's weakest in other texts, or most rapidly changing. That's seldom Chapter 1, though Ch, 1 is great to have as a *second* chapter.

(f) Other considerations in preparing a proposal: Write clearly using simple declarative sentences; sample materials should be logical & well-organized; know thy market & audience; pick the best publisher *for that specific project*. These shift the odds in favor of one being offered a contract, & then being successful (revisable) later. [75]

Summary

Because of small enrollments relative to engineering, industrial technology & technician-level disciplines, & the confusion & overlap with these other disciplines (like heavy ET use of Engr.-level texts), Engineering Technology has never had many textbook publishers offer the variety of options found in other STEM disciplines. A combination of two "events" that manifested in the early 1980's – declining ET enrollments & publisher consolidation – has reduced these choices even more ever since. Three other "events" preceded these two: big companies buying family-owned publishers; publishers shifting from "serving the field" to focusing on big market (intro) books; & college bookstores being bought by "chains." Digital books, Amazon.com competition & other recent "events" have prevented recovery or renewal of publisher interest in ET, despite a growing number of ET programs. Approaching a non-traditional publisher interested in doing ET texts, & able to be profitable selling only 1,000 or so first year copies – Industrial Press is nearly unique in doing *both* – is likely the best strategy for ETD/ would-be authors to take after survey data is gathered. Approaching Pearson/ PH, Cengage/ Delmar, SME &/ or Momentum Press (for different reasons) might also work, supplemented by self-publishing. A would-be author in ET: needs to assess if s/he has traits & motivation correlated with success; figure out the best strategy to take to find & approach the right publisher; & prepare a "winning proposal" to win over peer reviewers. A free-lance "placement" editor could help navigate this process at no author cost.

1. From ABET's abet.org website; Full name is Accrediting Board of Engineering & Technology.
2. US Dept. of Labor, Bureau of Labor Statistics, Standard Occupational Classification, 2010 online.
3. Profiles of Engineering & Engineering Technology Colleges, ASEE, 2010 Edition; excl. Puerto Rico.
4. Ibid. At a few schools, Mfg. ET is offered. U of Dayton has Industrial ET, but has not found others at recent ASEE Conferences, despite trying; is that due to old stigma of "Industrial Tech"s low level?
5. All Engr. Econ texts still teach 1st from tables, as FE exam takers must use these tables. Yet industry only uses Excel spreadsheets! But FE's moving from paper & pencil to online taking; won't Excel-based exam follow? Paradox: engineers usually derive formulas, & technicians use tables; not here!
6. % of ET text sales (in units) from Canada can be 25% for R. L. Mott, Applied Fluid Mechanics & Machine Elements in Mechanical Design (both 1st C. E. Merrill; now Pearson-PH) per proprietary data from 1985 this paper's author (PA) saw; still true in 2012 per Bob Mott at San Antonio ASEE; higher math level of Canadian "technicians" equivalent to ET in US, vs. lower level US "technician" math.
7. Example: Introductory Circuit Analysis 4th Ed. by R. L. Boylestad, C.E. Merrill, 1982, sold over 36,000 copies 1st year, 100,000 copies for the edition; it was CEM's #1 title in $ that year, & was one of their top 5 college titles every year for 10+ years. 2 Engineering Dept's (U of Idaho & US Naval Academy) adopted Boylestad, as they taught circuits first term (odd, vs. 2nd year); Proprietary data.
8. ATMAE = The Association of Technology, Management & Applied Engineering, formerly NAIT (National Association of Industrial Technology). The term "industrial technology" is often deemed "technician level," which may be why so few Industrial Engr. Tech degrees exist (per endnote #4).
9. Besides ASEE/ETD/ABET & ATMAE, 3 technician-level educational non-profit associations use "technology" (or "technical")" in their own title (& member schools' names): ACTE (Association of Career & Technology Education; formerly AVA, American Vocational Ass'n); ATEA (American Technical Education Ass'n; & NATTS (National Association of Trade & Technical Schools, for proprietary "tech" schools). Source: back pages of Technician Education Directory, 1986, Prakken. Unlike College directories updated annually, TED was published infrequently: 1975, 1986, none since.
10. Technician training was historically a "terminal degree" of 1-2 years, whether at a technical college, career center, vocational high school or union apprenticeship/ company training program. Practical hands-on training in a trade or skill; math often just algebra & right angle trig; values are looked up in tables vs. "derived." As per technology (unlike engineering), technician-level programs aren't grouped in a single educational directory (since obsolete TED '86 per endnotes # 9, 11, 12), thus hard to locate.
11. Best source for former school names is Technician Education Directory, 1986, Prakken. Good sources for today's school names are college's/ each state's Higher Ed. / 2-yr. Col. Div./ Wikipedia web sites.
12. As per note #10: proprietary schools, career centers & technical colleges rarely appear in one directory.
13. Source for information on NICET: back pages of Technician Education Directory, 1986, Prakken
14. Chronicle of Higher Education devoted many articles to this topic at the time.
15. Writer's Market, 1974, R. R. Bowker; this paper's author (PA) applied for sales positions at 30 college textbook publishers in 1974, using Writer's Market to identify & locate them.
16. Publisher's Weekly & Educational Marketer (a bi-weekly subscription-based industry newsletter © Simba) archives from the period would confirm both the data and the timeline.
17. Source: http://www.infoplease.com/encyclopedia/entertainment/book-publishing-mergers-acquisitions.html entry in online encyclopedia Info Please
18. Numbers courtesy of paper's author's proprietary info & discussions with other editors during 1980's & '90's (& verified by other rivals); Al Lowe (at SRA in 1980's, ex-MH) was particularly reliable source. Grob sold more because: (a) "below-ET" market was (& is) considerably larger; (b) No effective competition; whereas Jackson 1st beat out Church & then lost to Boylestad (1968. took #1 in 1975).
19. DeVry's impact on upper division EET titles was substantial -- at least 2,000 of 6-7,000 market size estimated in early-to-mid 1980's; & why EET Jr./Sr. level texts are more feasible vs. other tech's.
20. From 1980-1985 this paper's author was Merrill's Technology Editor, Merrill's most successful "list" then, having 3 of the 5 best-selling titles in the college division (all electronics); no one else wanted the job at first due to non-glamorous small markets; but low cost of entry, few used books > profitable!
21. Same source as note #17 (online encyclopedia Info Please)
22. Publisher's Weekly & Educational Marketer, 2 industry publications of the period may shed some light, but the conclusions are only obvious historically. Every college textbook publisher was clearly

doing this by 1982, based on published titles, this author's memory of proprietary editorial meetings & increasing complaints this author heard from professors ("*My* math book was much smaller, simpler").

23. The "new features" – borrowed from K-12 colleagues – included going 4-color; fancier illustrations (especially "pretty" photos); new pedagogy (chapter objectives, key terms, interest boxes, "pioneer portraits") & elaborate packages (study guides, instructor's guides & editions, overheads, films, etc.)
24. See note #20. By 1985, the "glamour subject" editors were jealous of CEM's ET list success, unaware of limited secretarial & developmental help, resisting push for sizzle vs. $ on accuracy checking, etc.
25. Publisher's Weekly & Educational Marketer had many articles then about text price increases. The National Association of College Stores (NACS) published (now online) a "Bucks for Books" brochure breaking down textbook costs, showing publishers, not stores, getting almost all $$, + how textbooks were still bargains vs. cigarettes & beer (!). In 1979, resold professors' exam copies was an $8 million business (small college publisher size) - by 1985, it grew 10x larger, leveling off only when certain universities barred buyers from campus, stopped campus stores from selling marked desk copies & told selling professors they owed the IRS taxes! Publishers blamed rising prices on inflation-driven costs (paper, etc.). Red herring! Mfg. costs (printing, paper & binding) are 1/6th or less of net price.
26. But, especially for mechanical & civil ET titles – & controls/ machinery books/ chapters in electrical ET -- enough U.S. Customary Units were used instead of SI Metric to deter Canadian adoptions.
27. See Note #18; author was told this by MH's then-ET editor; verified by Al Lowe (ex-MH ET editor).
28. This author ran up against this "rule" with several publishers as editor; it applied even for Jr./Sr. level courses with little or no competition , as it was developed for Intro course situations, their total focus.
29. This author recalls his then-company's 2 New England reps having a bad sales year when Follett's & B&N took over & ordered centrally, crossing territory lines. Did Harvard buy 2-year college text? No!
30. This is what this article's author saw at the on-campus store at Purdue- W. Lafayette in 1998.
31. Can confirm via prior copyright years listed in current editions (though publishers also have moved up the month in the *prior year* that next year's copyright is used to as early as Feb./ March). Intro EET titles started resembling other "Intro" texts in other ways: full 4-color, more pedagogy & ancillaries.
32. Data from proprietary info the author had working for C.E. Merrill; Educational Marketer can confirm.
33. ASEE has done studies of this Engr. enrollment cycle: number of undergraduate freshmen engineering majors (all types) has fluctuated between about 50-60,000 at the bottom & 100-120,000 at the top.
34. Business majors had highest average GPA's & Education majors the lowest in the early 1980's, as B schools could afford to be picky, Educ. schools could not. Via discussions with both faculties c. 1980.
35. Based on faculty conversations author had from 1980-1996 while working for Merrill, Delmar, West.
36. Hartford State Tech went from robust ET programs in a large building to extinction – no ET programs at all at its absorbing CC, despite having other non-engr. "technical" programs (health, police, etc.)
37. Same as note #35, plus additional conversations since 1996 while working with McGraw-Hill & Industrial Press. California's State Education Commissioner in the early 1990's declared that "all high school students should get an academic degree." Instructors told this author that this killed secondary tech programs, so CA's 2-year college tech programs lost a key student pipeline; & so did industry!
38. See notes #18 & 27. While the initial effect of McGraw-Hill requiring 5000+ first year sales units as a "floor" was to stop signing & publishing new technology/ technician-level titles in most tech markets as of the early-mid-1980's, as enrollments kept declining, only a few titles could even be revised!
39. #'s per Profiles of Engineering & Engineering Technology Colleges, ASEE, 2010 Edition; example of a school replacing several technician programs with a single engr. tech pgm.: Triton Coll. (2-yr, IL)
40. ITT Institutes, ECPI (Mid-Atlantic Electronic Tech) & Baker College (Michigan) are 3 chains w/ ET.
41. Data in this paragraph based on campus & convention interviews this author conducted, mainly since 2010; can be confirmed by checking recent online college catalogs, class schedules & ASEE data. Program #'s per Profiles of Engineering & Engineering Technology Colleges, ASEE, 2010 Edition.
42. Verify timetable & sequence of mergers via Publisher's Weekly & Educational Marketer back issues; http://www.infoplease.com/encyclopedia/entertainment/book-publishing-mergers-acquisitions.html entry in online encyclopedia Info Please; online Bulletin of Medical Library Association of July, 2001, http://www.ncbi.nlm.nih.gov/pmc/articles/PMC34566; type in publisher's original name in Wikipedia. Educational Marketer listed 10 largest college text publishers quarterly; West made the list in 1995 only because mergers had reduced # of college publishers from 30 to 12; by 1997, West was gone, too.
43. What follows re publisher motivations, editorial & sales strategies, etc. were obtained when this author was sales mgr. & editor (1980's-'90's), via contacts at other textbook publishers; from going through

old printed catalogs picked up at ASEE, ATMAE & ATEA; & now online via publisher web sites. Faculty reactions are via the author's interviews with tech ed. deans & instructors over past 30+ years.

44. While AW/ Benj. Cummings never had a technology list, their Tech Math & Tech Math with Calculus series by Allyn Washington (2-year college author in NYS) dominated that market for decades, selling 50,000 or more copies combined in a single year in its heyday. PH had a competitor by Calter, which it stopped supporting once Pearson bought AW & folded its college division in with PH's.
45. Examples of dominant titles cut: Kepler, Graphical Kinematics; Pare, Descriptive Geometry; Crouse & Anglin (entire automotive series). Except for Sacks Welding, tech titles taken from Glencoe/Macmillan (via Bennett, McKnight) have also vanished. Irony: McGraw offspring all started as College sales reps before entering MH mgmt.! Apax sale may only be first step to merger w/ PH/ Cengage per past sales.
46. Digital texts come in two varieties: as a stand-alone alternative to print, & as an "add-on." The latter is an attempt to drive more new copy print sales by offering it "free" to new text adopters; if prof. assigns the "add-on" material, only new print text buyers benefit, because online access expires after one term; Federal law requires "unbundling" & selling online piece alone, but wipes out all used book "savings."
47. Online digital-only sales are still a small fraction of total text sales (<10%) even in the intro courses where they're available (often just a few big courses). Online texts are like rentals – only available for a semester – no resale, no used books! Thus, many bookstores (especially 2-year college stores, most still campus-owned) discourage their sale, or won't permit them, or insist there's no demand yet.
48. Coke is a Trademark of the Coca-Cola Bottling Company.
49. Again, only worth doing for large introductory courses. Ironically, some Midwest Colleges have been book rental schools for decades. These colleges *really* hate Digital texts: if student drops out, no refund
50. Once again, when a publisher's revenues & profits drop, costs go up, book prices are raised (more used books are sold than ever), thus affecting ET indirectly, as ET publisher suffers in *other* disciplines.
51. The Boston Globe, Wed., 3/20/2013, p.2, 1st section; small article lower half of The Nation page (AP).
52. Small enrollments per course & lab-oriented courses are why *some* big trends of "digital revolution" don't have big ET impact. Ex's.: MOOC's (Massive Open Online Courses) work best for general ed.; lab courses weak as "remote" courses. One way budget cuts (due to under-funded state governments) lower enrollments: in California (a lot; other states, too), students can't graduate on time due to too few sections of required classes. So recessions can help publishers, but not depressions/ severe recessions; author's father had to drop out of junior college in 1933 - it closed, as they couldn't pay the teachers!
53. This section of "possible solutions" is based on this author's experience acquiring, developing & selling ET & other technology titles for each of the big 3 publishers (or lists merged in with theirs) & virtually every other publisher mentioned (except Wiley). This is key "source" of all statements made (pro & con) about publishers – as the disclaimers note – plus many discussions with ETD & other tech faculty, with several at ASEE in 2010 (Louisville) & 2012 (San Antonio) that caused shifts in thought.
54. Two of this author's most successful text authors, R. Boylestad (EET) & R. L. Mott (MET), also had successful titles with PH. C.E. Merrill/ Macmillan's "merger" into PH united these titles under one roof for the first time. While PH's legendary marketing should have meant these authors' PH titles had out-sold CEM's, not so! Was it because ET was CEM's most successful list, vs. tiny within vast PH? These titles – plus those by T. Floyd (no PH text prior to merger) – still dominate 30-years + later!
55. This paper's author (PA) was "laid off" (results were not considered, just politics) by the same people twice in seven years! West's authors suffered even worse, though a few West ET titles survived the merger & have even been revised. At least PA knew what to expect with the merger vs. colleagues at West: the corporate cultures of West & Thomson (now Cengage) were incompatible, as West rewarded success & loyalty (authors kept the same editor for *decades*) vs. Thomson's "everyone's expendable."
56. Pre-1980, McGraw-Hill Trade & Tech reps were all ex-shop teachers. Then Business (Gregg) & T/T sales forces merged, to T/T customers' neglect (sales reps focused on higher enrollment business adoptions). PA thinks peculiar MH financial rules killed T/T list: the 5,000 unit rule; cutting 50-80 arbitrary pp. in Malvino's Electronic Principles 4E (over budget), benefiting Floyd's new CEM text; scrapping convention spending & editorial travel in Nov.-Dec. almost yearly to balance budget, thus missing key Dec. show (AVA, now ACTE, see Note #9). PA helped sell 2nd Ed. of MH's #1 PLC title just as tech sales moved from Glencoe reps to Higher Ed reps; most prospects hadn't seen new ed., so sent samples; MH Tech Editor told me it was year's only Tech title to meet (& exceed) forecast!
57. This author would only benefit if author or ETD works through me, vs. IP directly. One reason to do so is that small market books aren't "developed" (it's a volume business; no time to do so). See Sec. IV.

58. With both Industrial Press & Momentum Press, any author this paper's author (PA) "found" as a free-lance "placement" editor (FLE) would usually benefit the PA/ FLE ONLY if author approaches PA/ FLE first vs. contacting anyone else associated with either publisher, because (again) as with employment agencies, the PA as FLE receives no salary or retainer from either publisher, but collects a fee once a contract is signed. Examples of ET courses likely well-suited to MP: Foundry; Engr. Econ Case Problems using Excel; GD&T; PLC Lab; Using Composites in Marine Applications.

59. To investigate pros & cons of self-publishing vs. commercial, this paper's author (PA) requested self-publishers' info for books PA hopes to publish. Also, PA recently worked at a publisher with several previously self-published authors. Finally, an author PA has known at 3 different publishers contrasted his personal self-publishing experience vs. working with commercial publishers during discussions.

60. Section IV shortened & adapted by PA from workshop PA gave "Unique Rewards & Risks of Writing Technical Textbooks Today" at NAWI (Nat'l Ass'n for Workforce Improvement), Boston 5/25/2012.

61. These "personal opinions" of PA re low success odds are from 30+ years' experience in college book publishing, verifiable in Publishers' Weekly. Text publishers are notorious "proof" of business's 20-80 rule," i.e., 80% of new sales are made by 20% of sales reps; 80% of profit comes from 20% of titles. At one publisher in 1995, PA saw printout ranking annual sales by $$: first 25 items on first page – of 1500+ ISBN #'s in 28-page report – accounted for *half* the company's revenue (rest of the printout was the other half)! While 3/4ths of the items listed were instructor's guides, CD-ROM disks, other ancillaries & old editions, this printout still confirms PA's contention that the 20-80 rule is more like a 5-95 rule in textbook publishing – a tiny number of winners subsidize all the rest!

62. Same source as #60 above; this particular list was given as a two-part overhead within a section on "is it (writing a technical textbook) worth it?" entitled "Yes, the more the following fits you" & No, the less…" that is now combined into a single "Yes" list, with elaborations given in next listed item (#2).

63. This author thanks Robert L. Mott for the idea of treating ET text royalties as an "annuity." After first being angry for such a small payout from first year sales of his first text after all the time he'd spent writing it, Bob saw steady sales year after year –a revision not really being needed for 7 years – so he came to see the financial reward as worth it over the long haul, instead of right away; & wrote 2 more!

64. Purposely choosing Industrial Press example, because, (i) IP is most likely publisher willing & able to publish profitable texts expecting only 1,000-1,600 copies sold first year; (ii) IP's prices are lower than most textbook publishers, so modest expectations re author's return per copy; (iii) IP gives college bookstores a much higher discount (35%, so net price is only 65% of projected list, vs. 77% average for most publishers – per NACS (National Assoc. of College Stores, www.nacs.org)), lowering royalty per copy even more; (iv) IP often pays a higher royalty *rate* than other text publishers pay on ET, technician & engineering titles, old std. 15% of net (1st ex. presumes 12.5%) vs. more typical 10%.

65. The paper's author has seen Scenario #2 repeated over & over. A specific recent example: an ET author can neither get a release to write a 2nd Ed. Robotics text elsewhere, nor will the publisher revise, as 1st Ed. never quite sold 1,000 copies in any year, or to use publisher jargon, it's a "3-digit midget."

66. Key reason to remainder inventory of slow-sellers is to *limit inventory taxes* states impose on all items in the warehouse on 12/31 – it's also why publishers are often out of stock on popular second semester titles at year-end; they "cut it close" to avoid accepting new inventory mid-December to pay taxes on!

67. There are "technology" agents, but they're trade/ professional book experts, NOT text market savvy.

68. Developmental Editors (DE's) were added in the 1970's as college textbooks' packages became too complex for an acquisitions editor (AE) to handle solo. DE's get peer reviews, compare contents of a new manuscript to leading competitors (topic by topic, page by page, # of problems per topic, etc.), contract ancillary authors, etc. AE's get no development help for small market titles. Titles are signed/ published *only* when peer reviewers say, "Yes, I will adopt … if the rest matches these samples."

69. A good free-lance editor knows: which publisher is entering vs. exiting market & if publisher of market-leading text is better approached or avoided (see Note #70 below); which editors have market experience vs. not, & if an editor is competent, even if inexperienced; publishers' stability (see #70).

70. Tricky: #1 publisher in a field *may* be best choice (thorough marketing in discipline; understands nuances of market niches that sound alike, but order different books). But maybe not: if they *already* publish niche's market leader, an eager rival may promote better (not "bury" your title vs. #1 next Ed.). Or market size is too small for a publisher – period *or* unless you OK absurdly low royalty rate. Or one publisher charges much higher prices, so higher royalties per copy, but maybe fewer sold? As for publisher stability: likelihood of major near-term shakeup? How often do editors "turn over" (problem

of veteran authors: "breaking in" a new editor each edition)? Right choice for YOU may require given publishers' politics, editorial "quirks," etc. As for "fatal flaws" that cause rejection: incomplete proposal; poor grasp of market & competition; either overly wordy or leaving out too many steps, topics or explanations; poor organization; inconsistent format; poor syntax (vs. easily fixed spelling & grammar); many technical errors; radically new approach without followers; too few illustrations &/or problem sets; no pedagogy; dismissal of/ or ignorance as to what market's dominant text does ***right***.

71. Most contested clause in publisher's contract; a key reason TAA (Textbook Authors' Ass'n) formed! Most contracted manuscripts *are* published (whereas most proposals aren't signed & most published books fail), but would-be authors would benefit from an advocate to avoid "unacceptable MS" label.
72. Unlike a typical "literary" agent, in this instance the "agent" will know the ET text market *WELL*!
73. Well-meaning "green" editors can botch an author's book – by getting reviewers from wrong part of tech market (happens too often – as noted). "Wrong level" reviewers are prevalent in "technology," more than any other academic discipline (regional variations in programs, similar names for different levels, inexperienced editors, too few coherent reviewers at the right level. Sales reps mis-sample, too.
74. Publishing people (rarely STEM majors) are overly impressed by glitz, nice designs, white space use, chapter-opening photos, color used for effect – vs. to aid comprehension, etc.; ET professors are far more interested in utility, clarity & accuracy. As for pedagogy: chapter objectives, key terms, problem sets graded in difficulty, useful diagrams are preferred. Most useful ancillaries? Answers to text's problems; overheads (many classes to prep) & labs often trump study guides, personality profiles, etc.
75. This last part of Section IV on preparing a "winning proposal" is based on several handouts the paper's author (PA) has prepared for prospective text authors over the years, recently updated & condensed for this paper vs. what PA normally sends to prospective text authors who've inquired about his service.