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Finally, I demonstrate how the various scholarly habits of mind and models of practice that help define the student-as-scholar are potentially developed in teaching and learning contexts identified as ‘high-impact educational practices’. These scholarly habits of mind, models of practice, and high-impact practices are placed in the broader context of ‘purposeful pathways’, i.e., degree-level curricular and co-curricular plans that could be considered as analogues of faculty-scholars’ research agendas.

Keywords
Boyer, Student-as-scholar, High-impact practices, Purposeful pathways

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In his *Scholarship Reconsidered: Priorities of the Professoriate,* Ernest L. Boyer argued for a conception of 'scholarship' that recognizes traditional research – what he termed the 'scholarship of discovery' – but which also includes the scholarly domains of 'integration', 'application', and 'teaching'. His validation of teaching has spawned a virtual 'industry' devoted to what is now known as the Scholarship of Teaching and Learning (SoTL).

In this paper I seize upon the fact that, *in the process* of assembling his argument for better recognition of the range of faculty work, Boyer reconsidered the very *concept* of scholarship, arriving at a broader conception that highlights and celebrates a rich intersection of varied scholarly activities and practices. After introducing Boyer's four domains of scholarship and summarizing the various scholarly activities – what might be termed the 'habits of mind' and 'models of practice' – that are associated with those domains, I use the faculty-teaching-scholar template that emerges to generate a map for the development of the *student*-as-scholar. There is, I believe, a serious need to balance the (quantitatively and qualitatively) great work on the faculty-teaching component of SoTL with an increased focus on the student-learning side.

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Introduction

Two decades ago, in his *Scholarship Reconsidered: Priorities of the Professoriate,* Ernest L. Boyer argued that one of the more pressing issues in post-secondary education was that of faculty time. He called into question the reward system used for recognition of faculty work, favoring as it did at the time (and, arguably, frequently still does) traditional research over engaged teaching, and felt strongly that it was time to "give the familiar and honorable term 'scholarship' a broader, more capacious meaning, one that brings legitimacy to the full scope of academic work"(16). To that end, he recommended recognition of three additional modes of scholarship beyond that of the 'scholarship of discovery', which was his term for traditional research: the scholarship of integration, of application, and of teaching. Of the four, the scholarship of teaching was deemed the most fundamental and has, arguably, been the mode of scholarship that has received the most attention, spawning an entire field of inquiry devoted to what has come to be known as the Scholarship of Teaching and Learning (SoTL).

But my point in this paper is not to rehearse Boyer's *Scholarship Reconsidered* in terms of its argument for faculty reward and recognition systems, as important as those surely are. Rather, I want to seize upon what Boyer did *in the process* of assembling his argument for better recognition of the range of faculty work, namely, the fact that he reconsidered the very *concept* of scholarship, arriving at a broader conception that embodies and celebrates a rich palette of varied and intersecting scholarly activities and practices. It is this broader conception of scholarship, and especially the much more robust array of scholarly activities that define Boyer's four, overlapping modes of scholarship, that provides the context for the present paper.

After summarizing Boyer's four domains of scholarship and the various scholarly activities that are associated with those domains – what I will refer to as 'habits of mind' and 'models of practice' – I consider the image of the 'faculty-teaching-scholar' that emerges from that synopsis as a basis for the development of the '*student*-as-scholar', which is my ultimate concern in this paper. I then explore how the various scholarly habits of mind and models of practice that help define the student-as-scholar are potentially developed in teaching and learning contexts identified as 'high-impact educational practices', and finally place these practices in the broader context of what have recently been called 'purposeful pathways', i.e., degree-level plans that incorporate curricular, co-curricular, and personal-developmental dimensions of students' educational experiences.

Boyer's Four Domains of Scholarship

Let's begin, then, with a brief introduction to Boyer's four distinct, but overlapping, domains of scholarship and identify some of their associated scholarly habits of mind and models of practice. Boyer claims that the 'scholarship of discovery' "has come to be viewed as the first and most essential form of scholarly activity, with other functions flowing from it"(15). And that

> [no] tenets in the academy are held in higher regard than the commitment to knowledge for its own sake, to freedom of inquiry and to following, in a disciplined fashion, an investigation wherever it may lead. . . . Not just the outcomes [of research and discovery], but the process, and especially the passion, give meaning to the effort (17).

Boyer reinforces the importance of discovery when he notes that ". . . the probing mind of the researcher is an incalculably vital asset to the academy and the world. . . . The intellectual excitement fueled by this quest enlivens faculty and invigorates higher learning institutions . . ." (18).

Now, when scholars exhibit a "commitment to knowledge for its own sake, to freedom of inquiry and to following, in a disciplined fashion, an investigation wherever it may lead" they are in effect suggesting that discovery is not, or should not, always or only be driven by instrumentalism, that is, with some ultimate, predictably useful purpose in mind. It may well be 'pure' curiosity that motivates the process of discovery, and curiosity – also suggested by Boyer's mention of the scholar's "probing mind" – lies necessarily at the heart of virtually all scholarly activities. But in making a commitment to knowledge for its own sake, scholars are also playing an important 'curatorial role', as it were, worrying less about their own profiles and careers per se, and more about the preservation and advancement of the very discipline in which they are engaged.

And there is also mention in this particular scholarly activity of the *other* use of the word 'discipline'; to investigate "in a disciplined fashion" points to a habit, a practice that prizes rigor

and control, dedication and perseverance. Finally, in this brief foray into the scholarship of discovery, we note the importance of passion and intellectual excitement associated with research, as well as the significance attached not only to the outcomes of research, but to the process itself. Curiosity, preservation of the discipline, rigor and perseverance, passion and process – already a rich array of scholarly habits and practices we associate with a scholar in discovery mode.

Boyer's 'scholarship of integration' underscores the importance of "making connections across the disciplines, placing the specialties in larger context" and interpreting, drawing together, and bringing new insight to bear on original research (18-19). "The scholarship of integration also means interpretation, fitting one's own research – or the research of others – into larger intellectual patterns" (19). Inter-disciplinarity is one of today's educational buzz-words, and how could it be otherwise? When Boyer writes two decades ago that "as the boundaries of human knowledge are being dramatically reshaped, the academy surely must give increased attention to the scholarship of integration," he could just as easily have been writing in today's *New York Times* or *Chronicle of Higher Education*. The importance of – indeed the fundamental, one might say *urgent*, need for – integrative scholarship, habits of mind, and models of practice increases as information becomes more plentiful, more readily available in an increasing number of formats and, along with this ubiquity, more suspect. As we now know, information access is not the problem; scanning, sorting, selecting and synthesizing (all in large part because of the shear volume), are the challenges, but these are the challenges of the scholar.

Integrative scholarship also involves curiosity insofar as it requires questions as to the 'meaning' of various discoveries and intersections of knowledge. The 'what-if' kinds of questions fuel our tendencies towards multiple, interacting perspectives and methodologies. And then there is the ability to understand one's knowledge within a broader context. Inter-disciplinarity, interpretation, synthesizing, contextualization and, once again, curiosity all drive the integrative scholar.

The 'scholarship of application' is in some ways more self-explanatory. While the first two domains explored above involve investigative and synthesizing activities, this third mode seeks to ask how this knowledge can be used in the service of solutions to society's most pressing concerns. It asks if and how those problems and concerns can define an agenda for scholarly investigation (21). Boyer also identifies a very important feature of application insofar as it is 'bi-directional'; that is, while the term may suggest that knowledge is first discovered and then applied, it may also be the case that "new intellectual understandings can arise out of the very act of application," thereby revealing interactions between theory and practice, each renewing and informing the other (23). Associated with this bi-directional mode of influence between theory and practice, is the important practice of reflection. While all domains of scholarship involve reflection, those engaged in application must constantly review the efficacy of applied theoretical knowledge on particular problems as well as on the ways their findings through application can inform and refine their disciplinary theories. Among the scholarly habits of mind and models of practice associated with Boyer's domain of application, recognition of the bi-directional path of influence between theory and practice, tendencies towards reflection, a commitment to society and service and, once again, a profound spirit of curiosity – here, with respect to the 'utility' of knowledge – are paramount.

Finally, Boyer defines the 'scholarship of teaching'. "As a *scholarly* enterprise," Boyer asserts, "teaching begins with what the teacher knows" (23). Teachers must be well informed, steeped in the knowledge of their fields, and intellectually engaged. He underscores the importance of the teacher's role not only in transmitting knowledge to students, but transforming and extending that knowledge, processes that in turn have teachers functioning as learners along side the

students. "In the end," Boyer argues, " teaching keeps the flame of scholarship alive" and without it, "the continuity of knowledge will be broken and the store of human knowledge dangerously diminished" (24). This last activity places a heavy responsibility on teaching-scholars.

Preparedness is a quality vital to the domain of teaching – as anyone who has ever taught a class *un*prepared would know! – and is a quality, moreover, that applies to one's disciplinary knowledge but also to one's knowledge of the *pedagogy* of that discipline. Boyer's scholarship of teaching requires scholar-teachers to be intellectually engaged, again manifest in their deep sense of curiosity, and to model that engagement and curiosity for those whom they teach and influence so powerfully. There is an additional sense of responsibility attached to the scholarship of teaching insofar as knowledge is to be transformed and extended, not merely transmitted. And perhaps the most significant of scholarly attributes of those engaged in the scholarship of teaching is their role as learners, again motivated by an unshakable sense of curiosity. As Mary Taylor Huber and Pat Hutchings note: "Serious work on teaching begins . . . where all scholarship begins, with curiosity and an urge to understand more clearly what is happening and why" (2005, p. 21). Preparedness, responsibility, and curiosity: the stuff of a teaching-scholar's life.

Scholarly Habits and Practices Associated with Boyer's Domains

Boyer has given us an impressive, if ambitious, list of scholarly habits and practices associated with his four domains of scholarship. His broadening of the scope of scholarship harkens back to an earlier time when, as he puts it, that concept "referred to a variety of creative work carried on in a variety of places, and its integrity was measured by the ability to think, communicate, and learn"(15), and we can easily imagine these abilities relating to all four of his modes of scholarship. In fact, the entire list, summarized in **Fig. 1**, reveals the interrelatedness of the four modes alluded to at the outset. Curiosity, for example, is something that in different ways, for different reasons, and with different goals in mind, is a fundamental part of all four modes of scholarship. Responsibility, again, perhaps to different constituencies, is a common theme. Ditto with passion, for no one really engages in these scholarly activities, or at least they should not do so, without a profound sense of passion to do so. And, of course, some of the properties identified with one scholarly domain arguably underpin the others, even if they did not emerge from Boyer's individual definitions. One could easily make the argument, for example, that reflection is necessarily something that all facets of scholarship require; or interpretation; or certainly perseverance.

Figure 1. Boyer's Scholarly Habits of Mind and Models of Practice and Associated Qualities of a Scholar

INTEGRATION:	C	O	U	R	A	G	E
Making connections across the disciplines; synthesizing Interpreting, drawing together Placing specialties in larger context Questioning the meaning of discoveries (not just what is found, but what is its meaning) Interpret findings in a more comprehensive way	Curiosity				Interpretation Synthesizing Contextualizing	(Passion)	Inter-disciplinarity

APPLICATION:	C	O	U	R	A	G	E
Use knowledge to solve society's problems Problems can also suggest research agendas (suggest means for solutions) Theory and practice bi-directional, each informing the other Application can itself yield new understandings tied to one's field of knowledge; Service is a form of application iff: it flows directly from professional activity; it is subject to same rigor as research	Problem-based Curiosity	Responsibility to Society/ Community		Reflection		(Passion)	Theory-Practice-Theory

TEACHING:	C	O	U	R	A	G	E
Requires teacher to be well informed; steeped in knowledge of field; Intellectually engaged Transmit knowledge but also transform and extend it Teacher functions as learner too Teaching keeps flame of scholarship alive; without it, continuity of knowledge is broken	Curiosity	Responsibility to Students to Discipline		Preparedness		Passion	Theory-Practice-Theory

E I E R A S B A I K L R I T Y

And while this list could be refined and expanded in any number of ways, to include other perhaps equally compelling habits, practices, and qualities, my point in this paper at least was to use Boyer as the main source for scholarly attributes. I will, however, suggest inclusion of two more properties to round out our provisional template of the faculty-scholar. The first is actually a constellation of related properties that, as indicated vertically on the right side of **Fig. 1**, includes vulnerability, fear, and risk. These are not so much habits or practices of a scholar as they are mental or even emotional 'states' that may accompany them in one way or another and to varying degrees in virtually all of the scholarly activities we have been discussing. Whether it is advancing a particular argument in publication, raising an unpopular topic in class, probing a disturbing and uncomfortable issue in a clinical lab session, or seeking to apply one's theoretical knowledge to a difficult societal problem – all of which are forms of risk-taking, of venturing into the realm of the uncertain and unpredictable – scholars are vulnerable, vulnerable to review by

their peers, to scorn from their superiors, to hostility from the public, and complaints from their students.

Of course, the habit of mind that must be brought to bear on feelings of vulnerability, fear, and risk – indeed, that which must be modeled in the face of those circumstances – is 'courage'. Charles Glassick, Mary Taylor Huber, and Gene Maeroff argue that "a scholar must have the courage to risk disapproval in the name of candor. A scholar must possess the will to take on difficult or unpopular work that others avoid, transcending traditional ideas, rules, and patterns, and imaging new questions and problems" (1997, p. 65). Gill Nicholls reinforces this: "Courage is not always about stepping out into the breach; it can be simply about summoning up the necessary confidence to affirm one's own views and principles in a teaching session or in a publication" (2005, p. 24). I've listed courage across each of the four scholarly domains, so fundamental is it to the life of a scholar.

The final quality that must be added to any conception of a scholar, for it must apply to all of a scholar's habits and practices and is perhaps the most important quality to model for students, is integrity. Boyer asserts that "every faculty member must be held to the highest standards of integrity" (1990, p. 28). Glassick, Huber, and Maeroff go so far as to say that integrity is the "foundation of academic life" (1997, p. 63). Displaying accuracy in reporting research findings, giving appropriate credit through citations in publications, acting responsibly and professionally in community-education situations and professional conferences, and maintaining consistency and fairness in grading students, are only a few of the contexts in which integrity can and should be demonstrated by faculty, not only for the health of their own scholarly reputations, but also because their actions, behaviors, and attitudes are not only noticed by their students but often imitated, assumed to be right and appropriate.

From Faculty-as-Scholar to Student-as-Scholar

We now have what is likely a reasonably accurate snapshot of 'a *faculty*-scholar', at least in terms of the expanded notion of scholarship and its attendant scholarly activities as advanced by Boyer. How might this, I'll call it a 'template', serve as a model for use in the development of the *student* as scholar? And, for that matter, why would we want to do so? Within the SoTL movement there is a serious need to bring the community of student-learners into the conversation sooner and in a more systematic and engaged way. Kathleen McKinney suggests that "We need to bring in the student voice not merely in the role of subject but as co-researchers and interpreters of our data, and as individuals equipped to use the results to improve their own learning" (2007, p. 129). My own view is that 'SoTL' is not just 'SoT'. Nor, does the 'L' in 'SoTL' refer only or even principally to *faculty*-learners, though I am in full agreement with Thomas Ehrlich when he insists that "Great teachers must themselves be great learners, and the quality of their teaching is a function of their own learning" (1995, p. 25). But while it is appropriate and indeed fortunate that much of the creative and innovative work being done on the scholarship of teaching *does* in fact involve at least the relationship between teacher and student – in terms of how the teacher's approach is designed to facilitate better learning – the 'L' in SoTL is still highly geared towards *teachers* as learners. And, again, while that is in and of itself a good thing, still, we can and should do considerably more in terms of the 'other L' in 'SoTL', the *student*-learners.

And it seems to me that one of the most compelling reasons for bringing students into the conversation more fully and focusing on the student-learner side of SoTL more systematically is to *better balance educational responsibility*. SoTL's heightened emphasis on teaching strategies, while useful, necessary, and timely, runs the risk of deflecting attention and responsibility solely

(or at least further) to the teachers, notwithstanding their clichéd move from 'sage on the stage' to 'guide on the side'. The educational system needs to be more considerate of and accountable to students, but part of that accountability – part of the institutional responsibility to students – is in fact to *facilitate* their taking a greater sense of responsibility for their *own* education. Far from being punitive, or appearing to shirk institutional responsibility, if the opportunities really are provided, such a shift is a gift; in fact, if received in the right spirit and nurtured in the right way, it can be 'the gift that keeps on giving' (to employ another cliché). The kinds of scholarly habits of mind and models of practice expected of and demonstrated by *faculty-teaching*-scholars, as we have been discussing, have their analogues in the expectations we should have of our students, expectations they should have of themselves, opportunities they should seize, and responsibilities they should assume and cherish.

When we consider the properties and qualities associated with Boyer's habits of mind and models of practice – the words in the body of **Fig. 1** that I have teased out of Boyer's descriptions – it is immediately obvious that most of these are, or should be, applicable and relevant to the life of a scholarly *student*. For example, Boyer reminds us that, while scholarship certainly involves engaging in original research, it also involves "stepping back from that investigation, looking for connections, building bridges between theory and practice, and communicating one's knowledge effectively to students" (1990, p. 16). Well, apart from the very last word, identifying those at the receiving end of a teacher's communication, these are *exactly* the activities in which we expect our students to engage. The audience for students in the process of communicating their knowledge is obviously their teachers, but it can easily be their student colleagues, or those in the community through placements, internships, service-learning sites, and so on.

High-Impact Practices

For some time, it has been recognized that learning does not only take place in the classroom or the lab. And, whether we like it or not, for good or ill, our current generation of students seems to be, if not literally, then virtually, 'hard-wired' for multiple, quickly and frequently changing stimuli. The introduction of innovative teaching-learning contexts recently termed 'high-impact practices' seeks to address these realities. A synopsis of generally accepted high-impact practices, as defined by George Kuh (2008) and Andrea Leskes and Ross Miller (2006), is given in **Fig. 2**. These educational contexts provide numerous opportunities for students to experience, refine, demonstrate, and embody the habits, practices, attributes, and qualities associated with Boyer's scholarly domains, in short, to take a greater sense of responsibility for their own education.

Figure 2. Key Elements in HIGH-IMPACT PRACTICES (HIPs) as Defined by Kuh (2008) and Leskes & Miller (2006)

(Kuh) **(Leskes & Miller)**

UNDERGRADUATE RESEARCH: • Most prominently used in science disciplines • Scientists reshaping courses to connect key concepts with student involvement early and actively in connection with systematic research • Involve students in contested questions empirical observation, technology, and sense of excitement associated with working to answer important questions	• Leskes and Miler embed u/g research in "Authentic Tasks" • Student research and creative projects done individually or in groups • Often addresses open-ended issues • Often results in something that can be formally presented as a culmination • Guided by a faculty mentor • U/g research advances inquiry and integration, requiring range of knowledge, skills, interactions • Not only for honors theses, but now u/g research encouraged throughout degree • Faculty-led research projects may include students as part of a collaborative research team
FIRST-YEAR EXPERIENCE: • Small-group seminars with lots of student-faculty interaction • Emphasis on critical inquiry, frequent **WRITING**, information literacy, **COLLABORATIVE LEARNING**, and skills to develop intellectual and practical competencies • May involve students in faculty member's own research	• Includes curricular and co-curricular programs • Address development of skills, success, student-faculty interaction, intellectual living groups, activities, teamwork • Focus on **INTENSIVE WRITING**; possibly part of a multi-year **INTER-DISCIPLINARY** program • "Set entering students on their trajectory through college and so can provide an anchor to a purposeful pathway"
CORE CURRICULUM: • Kuh refers to "Common Intellectual Experiences" • Set of required courses, gen ed program, integrative studies, and/or participation in a **LEARNING COMMUNITY** • Combines broad themes with curricular and co-curricular options	
LEARNING COMMUNITIES: • Integrate learning across courses and involve students in "big questions" that matter beyond the classroom • Two or more "linked" courses taken as a group, work closely with each other and faculty (**COLLABORATION**) • Common topic, common readings, via different disciplines (**I-D**) • Some link courses from "liberal" and "professional" programs • Some feature **COMMUNITY SERVICE LEARNING**	• "Curricular architectural elements", institutionally-designated cluster of at least two linked courses; sometimes with integrative seminar • Address academic and social development in and outside of class and feature student-faculty interaction • Often used as part of **FYE** to build teamwork, sense of belonging, connections
WRITING-INTENSIVE COURSES: • Emphasize writing at all levels and across the curriculum • Revise writing for different audiences in different disciplines • Parallel efforts in quantitative reasoning, oral communication, info literacy, and even ethical inquiry	
COLLABORATIVE ASSIGNMENTS/PROJECTS: • "Learning to work and solve problems in the company of others" • Develop listening skills and understanding of others' insights • Study groups within a course, team-based assignments, co-operative projects and **UNDERGRADUATE RESEARCH**	• Leskes & Miller include collaboration in "Authentic Tasks" • Group assignments, problem solving, product and performance production • Grappling with unscripted problems, challenging issues helps refine process, synthesis techniques, as well as teamwork

GLOBAL LEARNING: • Courses and programs for students to explore cultures, life experiences, and worldviews different from their own • Often augmented by **COMMUNITY-SERVICE**	

LEARNING (CSL) or by study abroad	
COMMUNITY-SERVICE LEARNING (CSL): • Field-based **EXPERIENTIAL LEARNING**; direct experience with issues they study as they relate to analysis and solving of problems in the community • Apply their learning in real-world settings; reflect in class on their community-service experiences • Reinforce importance of giving back to community; working with community partners good preparation for citizenship	• Community-based educational experiences and service-related activities • AAC&U: "a credit-bearing instructional strategy that provides students with both meaningful service opportunities in interactive partnership with the community and academic structures for analysis of their contributions and learning" • **EXPERIENTIAL** education with activities to address human and community needs; opportunities to promote learning and development • Reflect on community contributions • Intersects with integrative learning and **GLOBAL LEARNING**
INTERNSHIPS, CO-OP, EXPERIENTIAL LEARNING: • Another form of experiential learning – direct experience in a work setting (usually related to their career interest) • Benefit from supervision and coaching from professionals in the field • If for credit, project/placement approved by faculty/department	• Categorized separately as **EXPERIENTIAL LEARNING**, which includes internships, co-op education, field placements, and **CSL** • Practical application of classroom learning outside the campus environment in a real-world setting • Planned by students and faculty, may carry academic credit or other recognition, require structured reflection and/or a final product/presentation
PROBLEM-BASED LEARNING:	• Refers to a teaching strategy involving students in problem solving; or to a formal technique PBL • PBL first developed in medical education; mostly found in science education • **COLLABORATIVE** teaching-learning strategy with small student-working groups, presented with a professional, public, or personal problem they would likely encounter in real life • Team determines material needed, gathers information, reports findings, whole process repeated until answer satisfies the team • PBL requires students to assume responsibility for their learning, as they do the research to write the thesis, rather than simply writing about a given topic
INTERDISCIPLINARITY (COURSES, EXPERIENCES, AND INSTRUCTION): • Instruction drawing on multiple disciplines • Many new fields are hybrid in nature	
CAPSTONE COURSES AND PROJECTS / CULMINATING EXPERIENCES: • A project created by students that integrates and applies what they have learned • Possibly a research paper, a performance, an exhibit of artwork, or a portfolio	• Credit-bearing integrative experiences in the final stages of a student's program • Encourages synthesis of the whole academic experience, often through creation of a product that shows an ability to frame and solve an open-ended question • Tied to major, but also tied to gen ed and even as a tool to bridge disciplines • Provide a "touch-point" on a student's **PURPOSEFUL PATHWAY**, allowing assessment of learning over time and across courses

While we will not have the time to explore all of these high-impact practices in detail, **Fig. 3** (below) and **Fig. 4** (later in the paper) summarize two of them: **UNDERGRADUATE RESEARCH** and the **FIRST-YEAR EXPERIENCE**, respectively. The bottom half of each figure lists many of the main

Figure 3. Scholarly Habits, Practices, and Qualities Exemplified in the Curricular, Co-Curricular, and Personal-Developmental Opportunities and Responsibilities Associated with the High-Impact Practice of *UNDERGRADUATE RESEARCH*

BOYER'S FOUR DOMAINS OF SCHOLARSHIP

DISCOVERY:	INTEGRATION:	APPLICATION:	TEACHING:
Curiosity Responsibility to discipline Process Passion Rigor Perseverance	Curiosity Interpretation Synthesizing Contextualizing (Passion) Inter-disciplinarity	Problem-based curiosity Responsibility to community/ society Reflection (Passion) Theory √ Practice	Curiosity Responsibility to students Responsibility to discipline Responsibility to institution (Theory √ Practice)
Think, learn, and communicate Courage Integrity	Think, learn, and communicate Courage Integrity	Think, learn, and communicate Courage Integrity	Think, learn, and communicate Courage Integrity

HIGH – IMPACT PRACTICE: UNDERGRADUATE RESEARCH

CURRICULAR:	CO-CURRICULAR:	PERSONAL-DEVELOPMENTAL:
Assist faculty in their research (as RA) Student's own research/ creative work In context of a course (**PBL**), thesis, or **CAPSTONE PROJECT** Often addresses an open-ended question/issue Instills passion for the pursuit of answers Results may be presented in undergraduate poster session/symposium Introduced in **FYE** and often developed through entire degree program Involves **COLLABORATION** (with other students – a **LEARNING COMMUNITY** – or at least with faculty-mentor May be part of a **CSL** Leadership as research peer mentor	Leadership as research peer mentor	

components of the high-impact practice in question – the activities, requirements, opportunities, and contexts, roughly sorted as to whether those components take place as part of a student's for-credit curriculum or non-credit co-curriculum, or whether they are more directly related to their personal-developmental domain. The top half of each chart lists the various scholarly habits of mind and models of practice that were distilled from Boyer's description of his four domains of scholarship. Although the domains of discovery, integration, application, and even teaching, can be and often are experienced by students through activities that are similar in kind as those undertaken by faculty-teaching-scholars – especially, for example, in the realm of the

curriculum – it is clear that the qualities, processes, and habits associated with those four domains may also be experienced and modeled by students in quite different ways, though just as richly and perhaps even more profoundly in some cases, in the co-curricular and personal-developmental dimensions of their lives.

That said, it is apparent from the synopsis on the bottom half of **Fig. 3** that undergraduate research in particular is fundamentally a curricular practice. This is not to suggest that some of the benefits of engaging in undergraduate research are not found in the co-curricular and personal-developmental dimensions of students' lives or that some of the scholarly habits and attitudes might not also apply to those other dimensions; just that the main context for this high-impact practice is in the curricular realm. We see, for example that the contexts for this kind of activity vary from assisting faculty in their research, perhaps as a research assistant or part of a research team, to engaging in their own research. The latter may be in the context of, e.g., a course that features problem-based learning (**PBL**), a community-service learning (**CSL**) placement, or a final thesis or **CAPSTONE PROJECT**. This also underscores the fact that high-impact practices frequently intersect with and reinforce each other.

In terms of habits and practices, research is, of course, driven fundamentally by curiosity and so the notion that undergraduate research is often based on an open-ended question or issue helps fuel that curiosity, along with a sense of passion – passion not only in finding a possible solution but, one would hope, a sense of passion for the process itself, the "thrill of the hunt," as it were. Edward Lipman points to John Dewey's view that "education had failed because it was guilty of a stupendous category mistake. It confused the refined, finished end products of inquiry with the raw, crude subject matter of inquiry and tried to get students to learn the solutions rather than investigate the problems and engage in inquiry for themselves" (1991, p. 15). Curiosity, passion, and appreciation for the meaningfulness of the process were identified as key habits and practices in Boyer's domain of discovery for faculty-scholars. It may well be the case that curiosity and passion in the student-scholar will be greatest when working on her own research rather than functioning in an assistant role for one of her faculty, though this latter experience is key in other respects, as will be noted.

What also becomes apparent in consideration of these activities associated with undergraduate research is that, as alluded to at the beginning of the paper, Boyer's four domains of scholarship are themselves intricately interconnected, often overlapping and intersecting. Undergraduate research will have students collecting and analyzing data, which in turn, involves interpretation and contextualizing and, if their research culminates in a Capstone project, that is likely also to involve significant synthesis – all elements associated with integrative scholarship. When students present their research, be it in the context of a single course, a capstone presentation or an undergraduate symposium, they are in effect making their scholarship public. In doing so, they face issues of fear and vulnerability not unlike those felt by faculty-scholars. And the courage required to face those anxieties is no less important for students; in fact, mounting such courage can be difficult and, yet, a vital part of their development as scholars and professionals. If research is undertaken in the context of a CSL course, responsibility to the community is demonstrated and preparation, punctuality, and professionalism are required. In view of the fact that senior students may take on roles as peer mentors in undergraduate research teams, those team leaders must also assume modest roles as teachers and supervisors, so the domain of teaching enters into their matrix of opportunities and responsibilities. In this capacity, they are responsible not only to themselves and to their teachers, but to other students as well, and so the element of preparedness noted earlier in connection with the faculty-teaching-scholar is thus also relevant to students serving as peer-mentors.

There is nothing earth shattering here. One would expect that undergraduate research would involve modeling much of the same kind of activity as that engaged in by faculty-scholars. But it seems to me that one of the most potent impacts undergraduate research can have on students is its ability *to start students thinking in a particular discipline*. I don't mean thinking 'about' a discipline, or thinking that just happens to be in this or that course which, in turn, is offered in this or that department. But 'climbing inside' a discipline, as it were, and starting to think from that vantage point, just as scholars and professionals in those disciplines think. David Lopatto states that undergraduate students researching in science gain an "understanding of how scientists think" (2010). Cathy Levenson notes that even if students are merely doing routine work assisting faculty in their research, they are nevertheless "engaged in the culture of a working laboratory." "Students," she continues, "need to be mentored in the entire research process" (2010). And Edward Lipman speaks, very convincingly I think, about the importance of thinking in the disciplines when he notes that

> just as the student of foreign languages must aspire to think in those languages (and not merely be able to translate mechanically from one language to the next while thinking only in his or her own), so the recipient of a liberal education must aspire to think in the different languages that the disciplines represent. It is not enough to learn what happened in history [for example]; we must be able to think historically (1991, p. 18).

Undergraduate research is indeed a high-impact practice. It can fuel students' curiosity and passion about a subject, give them access to and experience with the research process, with all of the rigor, preparation, and perseverance required of that process, introduce them to integrative operations such as interpretation, synthesis, and contextualization, and even give them valuable experience in a mentorship role with respect to their student peers. But these opportunities also come with significant responsibilities and the need to display the highest level of integrity in these activities. And undergraduate research is surely one of the best ways to introduce students to the life of the scholar in a particular discipline, to give them an entry point for their own pathway into a scholarly and/or professional life.

The broader message that emerges in all of this is that undergraduate students must be mentored in ways that promote a scholarly, professional attitude towards their education in general and their involvement in high-impact practices more particularly. Any so-called 'high-impact' practice will be anything but impactful to students if they think of it merely as another box to tick off their agenda. Modeling scholarly and professional habits, practices, and attitudes on the part of faculty is crucial in instilling those same qualities in their students.

High-Impact Practices and Purposeful Pathways

Space does not permit a robust discussion about the other practices widely recognized as having 'high impact' on students' educational experiences, but it should be clear that the scholarly attributes identified in connection with Boyer's four domains of scholarship can and need to be modeled by students engaged in those educational practices as they develop into scholars and professionals. And for any given student, that path is both complex and unique. While we have focused on the *scholarly/ professional* elements of their education, as mentioned, students' lives are not compartmentalized into curricular, co-curricular, and personal-developmental categories the way, e.g., books are sorted in a library. The various dimensions of students' lives intersect, rub up against each other, influence and even interfere with each other. As we've seen, many of the scholarly or professional attributes gleaned from Boyer's scholarly domains apply to the scholarly-curricular dimension, but they may also apply – indeed in some cases they *should* apply – to other areas of students' educational experience for, although that experience should

be *principally* academic, it can not nor should not be *solely* academic. And so I will finish by placing some of the high-impact practices we've been discussing into the context of a 'purposeful pathway'. "Purposeful pathways," according to Leskes and Miller, are

> designed sequences of courses or experiences, created by the faculty, that lead students to high levels of learning, intellectual skill development, and practical knowledge. They are plans that provide students with multiple opportunities to put specific knowledge and skills to use; each such opportunity relates to and builds on the previous ones (2006, p. 5).

Figure 4 represents the high-impact practice of the **First-Year Experience** in the same format as **Undergraduate Research** in **Fig. 3**. Given Leskes and Miller's definition of the purposeful pathway, it is clear from **Fig. 4** that the **First-Year Experience** is the obvious entry point into that pathway, if for no other reason than that, of all the high-impact practices, the **First-Year Experience** is perhaps the most complex and multi-dimensional. That is, its constellation of opportunities and responsibilities for the development of scholarly habits and practices extends

Figure 4. Scholarly Habits, Practices, and Qualities Exemplified in the Curricular, Co-Curricular, and Personal-Developmental Opportunities and Responsibilities Associated with the High-Impact Practice of the *First-Year Experience (FYE)*

Boyer's Four Domains of Scholarship

DISCOVERY:	**INTEGRATION:**	**APPLICATION:**	**TEACHING:**
Curiosity Responsibility to discipline Process Passion Rigor Perseverance	Curiosity Interpretation Synthesizing Contextualizing (Passion) Inter-disciplinarity	Problem-based curiosity Responsibility to community/ society Reflection (Passion) Theory √ Practice	Curiosity Responsibility to students Responsibility to discipline Responsibility to institution (Theory √ Practice)
Think, learn, and communicate Courage Integrity	Think, learn, and communicate Courage Integrity	Think, learn, and communicate Courage Integrity	Think, learn, and communicate Courage Integrity

High – Impact Practice: First – Year Experience (FYE)

CURRICULAR:	**CO-CURRICULAR:**	**PERSONAL-DEVELOPMENTAL:**
Identification of major Complete requirements Select electives in major Select free electives Meet all academic requirements to continue **Core Curriculum** **Writing Intensivity** Academic **Learning Community** **Interdisciplinary Experiences**	Academic transition, preparedness and skills acquisition (e.g., study, exam-taking, multiple-choice, time management, note-making) Residence-life programs (**Learning Community**) Campus clubs Leadership opportunities Volunteer opportunities	Personal/developmental transition Establish financial habits Socialization (sharing residence room) Maintaining emotional and physical well-being Identity building Seeking counseling if necessary

Seeking academic help
if necessary

far beyond the curricular, overlapping and intersecting with the co-curricular, and especially the personal-developmental regions of the student experience (as compared, say, to **UNDERGRADUATE RESEARCH**, as discussed in connection with **Fig. 3**). For example, we want students to embrace the value of process, be it in the context of a research agenda, completion of a term paper, or a solution to a course-assigned problem. But embracing process in other aspects of their lives, e.g., time-management, physical maintenance, and especially financial planning, are also critical and, ultimately, can seriously affect their academic and scholarly progress. Even in first year, students need to interpret texts, they especially need to reflect on the bi-directional influences of theory and practice in the early stages of disciplinary skills development, and they must start as soon as possible to develop habits of preparedness for courses, labs, music lessons, and so on. It goes without saying that these habits and practices of interpretation, reflection, and preparedness transfer over into all sectors of their educational experience.

In **Fig. 5** I have offered three very general, sample purposeful pathways that include different combinations of the high-impact practices we have been discussing. The top one might be

Figure 5. Sample Purposeful Pathways with Possible Sequences of High-Impact Practices and Attendant Habits, Practices, and Qualities in the Curricular, Co-Curricular, and Personal-Development Dimensions of Student's Overall Programs

	First Year	Middle Years	Final Year
PURPOSEFUL PATHWAY # 1 HIGH-IMPACT PRACTICES:	**FYE UGR ----------**	**UGR ---------- UGR ---------- UGR -------- PBL COLLAB. (VOLUNTEER)**	**CAP-STONE**
(HIP?):	**A C A D E M I C C U R R I C U L U M** (Selection of major and completion of major requirements; selection and completion of major electives; identification and completion of minor; selection and completion of free electives) **Curiosity; resp. to self and to discipline; analysis, reflection, synthesis, and process; perseverance; theory-practice interdependency; integrity.**		
Habits of Mind and Models of Practice:			
PURPOSEFUL PATHWAY # 2 HIGH-IMPACT PRACTICES:	**FYE ID ----------**	**ID ---- ---------- LC ---------- ID ----- (RELATED MINOR OR DOUBLE MAJOR) (ID CLUSTER + INTEGRATIVE SEMINAR) GLOBAL**	**CAP-STONE (I-D)**
(HIP?):	**A C A D E M I C C U R R I C U L U M** (Selection of major and completion of major requirements; selection and completion of major electives; identification and completion of minor; selection and completion of free electives) **Curiosity; resp. to self and to discipline; analysis, reflection, synthesis, and process; perseverance; theory-practice interdependency; integrity.**		
Habits of Mind and Models of Practice:			
PURPOSEFUL PATHWAY # 3 HIGH-IMPACT PRACTICES:	**FYE (VOLUNTEER) ------**	**CSL ---------- CSL (GROUP)---------- CO-OP ------- LC EXP. LRNG. COLLAB. (VOLUNTEER)**	**CSL (GRP) LC COL-LAB.**
(HIP?):	**A C A D E M I C C U R R I C U L U M** (Selection of major and completion of major requirements; selection and completion of major electives; identification and completion of minor; selection and completion of free electives) **Curiosity; resp. to self and to discipline; analysis, reflection, synthesis, and process; perseverance; theory-practice interdependency; integrity.**		
Habits of Mind and Models of Practice:			

thought to represent a student keenly interested in embedding undergraduate research into her program as much and as soon as possible. The second one might be the pathway for someone especially interested in two disciplines and the ways those disciplines intersect and may be enriched by a term abroad. And the third one might be the route a student takes who is in a quasi-applied program and who is looking to balance acquisition of knowledge in the classroom with experience in the community. Obviously, purposeful pathways are highly variable and changeable in the course of their unfolding, and most will likely feature more of a mix of educational opportunities than I have indicated here.

Leskes and Miller suggest in their definition of purposeful pathways that it is "created by the faculty" (2006, p. 5). While it is absolutely true that there is not likely to be much of an impact, much less a high impact, on students' educational experiences if the institutions writ large and especially the faculty working on the ground do not make the opportunities available to students, the set of courses and experiences that make up a particular student's purposeful pathway must be the result of a rich, candid, and ongoing conversation between the student and his or her academic advisor. This is where the responsibility for a high-impact education is shared across the institution, its faculty, and the students themselves.

I want finally to point to **Fig. 5** where, in each of the three sample purposeful pathways there is a layer called 'Academic Curriculum', with a parenthetical description below it. No one should underestimate the impact of a carefully-selected major, appropriately- and thoughtfully-chosen electives, or a purposefully-incorporated minor or second study. These are fundamentally important decisions and ones that, if made responsibly and logically, can have a significant impact on a student's experience. If, on the other hand, students decide on their major by default, pick electives based on their work schedules or rumors of 'bird-courses', and essentially treat the curriculum as a whole lot of boxes to be ticked off in order to gain a credential, then their overall educational experience is very likely to be one of low-impact. They may well graduate, and even graduate with decent grades in their individual courses, but their experience could lack coherence, meaning, and preparation for the post-degree, real-world chapter of their lives.

Conclusion

I have covered perhaps far too much ground and, regrettably, some of it in not enough detail. But I hope that the foregoing has at least stimulated some thinking about the important implications of Boyer's reconceptualization of scholarship, the ways that a Boyer-generated template for a faculty-teaching-scholar might be usefully mapped onto a student-as-scholar model, with the habits of mind and models of practice that symbolize the life of a scholar made available to students through carefully designed purposeful pathways that combine a thoughtfully planned curriculum with an appropriate array of high-impact educational practices. Of course, accountabilities through instruments such as course-, program-, and degree-level learning objectives and outcomes measures are key, not only in assessing the extent to which students have developed as budding scholars and professionals, but also in messaging to students what those scholarly and professional expectations are in the first place. But, alas, a more detailed inquiry into the world of assessment and outcomes is a topic for another paper.

"The only thing constant is change," so says the ancient Greek philosopher Heraclitus (at least as interpreted by Plato). The extent and rate of change around us is staggering: changes with respect to the amount, availability, and accuracy of information; changes in society's expectations of educational institutions and in the very complexion of those institutions; changes to, and elimination, addition, and combination of, academic disciplines; and constant and

unpredictable changes to the job market and the economy. It is interesting and significant to me that the features we have teased out of Boyer's work, things like appreciation of process, tolerance, reflection, synthesis, communication, responsibility, and integrity, all of these are *fundamental* qualities and, if there is a weakness in their apparent generality and broad applicability, that to me is also their great strength. These qualities are not 'flavor-of-the-month' habits and practices. Rather, in their breadth of influence and especially in their depth of impact, these qualities are among those that will sustain us, advance our profession, and enrich our communities. And those are pretty good reasons to pass these habits and practices on to our students.

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