

From School to Office: Recent Graduates' Perceptions of Architectural Education and Practice

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Recent graduates of architecture schools often report a mismatch between their experiences in academia and their experiences in the profession. We relate the findings of the first phase of a more extensive exploration that will examine these graduates' experiences, investigate the nature of the relationship between education and practice, and develop suggestions for bringing the two worlds into closer alignment.

During our time both as licensed architects and educators, we have joined others in observing a disconnect between the academy and the office. In schools, we have seen priority given to "design" architects, with little attention paid to "architects of record" who are often responsible for the long and messy process of bringing visions to reality. In practice, we have seen interns who expected to design high-profile projects become disillusioned once exposed to the fuller, more complex nature of architectural practice. Practitioners have expressed their frustration with the unrealistic expectations and lack of appropriate preparation of recent graduates.

Following a brief literature review on the relationship of education to practice, we present a questionnaire administered to recent alumni of Virginia Tech. We ask these alumni to describe their understanding of practice gained while in school, their sense of preparation when entering the profession, and their observations about the nature and degree of alignment between these two realms.

In our conclusions, we describe the relationship between a more theoretical and design-focused architectural education and the obligation of the architect to sustain a viable practice, to respond effectively to client-defined project needs and budget, and to ensure the health, safety and welfare of society. The ultimate goal of the research is to provide students, faculty, and practitioners with a clearer picture of the best ways to adequately prepare students to enter the profession.

INTRODUCTION

The architect can be likened to the composer of a symphony. It is not enough to envision a pleasing melody; the composer must also be intimately familiar with each instrument and how they

sound together to bring orchestral music to life. Similarly, the architect not only has to know how to conceptualize a piece of the built environment that is beautiful and serves its purpose well, he or she must also understand materials and building systems; governmental and budgetary constraints; and the capabilities of the labor force. It is in thoughtful response to such parameters that good architecture gets built, serves its users well, benefits the environment, and withstands the test of time.

In our involvement with architectural education in various schools of architecture in the U.S. and abroad, we have found that all too often the architect's work is presented mainly in the context of its initial design ideas. A design may well respond to its cultural context and the needs of its users, but it remains a theoretical exercise if it is devoid of an understanding of materials, environment, building systems, labor capacity, budgets, and regulations. Architects properly trained in the realization of their designs can ensure that their ideas take into account such critical contextual parameters and that their projects are carried through to completion to everyone's benefit.

Traditionally, architectural training concluded only after a lengthy apprenticeship with an established architectural practice where the budding architect learned the nuts and bolts of getting projects built. Interestingly, in the United States, the overall length of the period required to complete architectural training in conjunction with a series of licensing exams has been both substantially and deliberately shortened in recent years, as evidenced by the U.S. National Council of Registration Board (NCARB)'s most recent report.¹ The average time to complete NCARB's Architectural Experience Program® is down by over a year since 2013, and the 2019 numbers show that a majority (52%) of NCARB Record holders started their Record while still pursuing a degree, which is 6% higher than 2017, and up from less than 25% in 2009.

Is the profession best served by an increasingly condensed model of training that proceeds from the theoretical to the practical with little time for integration? Much of the information that architects need to know to get buildings built successfully is currently expected to be learned on the job, with minimal educational scaffolding. Though the in-depth complexities of codes, zoning, contracts, and compensation cannot be fully addressed in schools, at present these topics are scarcely

engaged. Introducing architecture students to aspects of practice is a topic of frequent and often contentious debate; in a recent opinion piece on Dezeen, Sean Griffiths states that “it is emphatically not the job of architecture education to mimic practice and generate workers for the profession in its present mode.”² Those in academe have an obligation to define the value of architecture in society and hold practitioners accountable for providing that value. However, to be relevant critics of contemporary practice, architecture students must have a basic working knowledge of that which they seek to influence. We ask, therefore: to what extent should the practical aspects of the architectural profession be integrated into an architect’s academic training?

A famous 1996 study entitled “Survey on the Education of Architects” was conducted by Ernest L. Boyer and Lee D. Mitgang.³ Colloquially known as the “Boyer Report”, this document takes a detailed look at architectural education in the U.S. and makes several recommendations concerning the relationship between the training of architects and their subsequent work in the profession. Among its conclusions, the Boyer Report recommends greater involvement of the profession in the training of architects to ensure that their training corresponds to what the profession needs, and that students have a clearer picture of what their future profession entails.

Thomas Fisher’s book, *In the Scheme of Things: Alternative Thinking on the Practice of Architecture*, discusses a range of issues facing architecture at the turn of the last century.⁴ Among them are ideas about bringing design thinking into the realm of practice. Fisher argues that this can be done by using the design skill of the architect to bear on the current deficiencies of the profession, including educating architects in financial and managerial matters, and teaching them to better communicate to their clients the value of their services. Architecture is contrasted with professions like medicine and law, which have done a better job of explaining their worth to the public. Like the authors of the Boyer Report, Fisher calls for a tighter connection between academia and practice by downplaying the importance of the individual, resisting the use of jargon, and bringing professionals and students into closer contact through work-study and other mentoring arrangements.

In a more recent contribution, Eric Cesal, in his book *Down Detour Road: An Architect in Search of Practice*, details his experience with the false bravado of architects and the ways in which the profession is failing to meet its obligations to society.⁵ Cesal describes a segregated architectural profession where a select number of high-profile architects and firms receive commissions for bold designs, while the remaining firms go about the more pedestrian work of executing competent buildings, often within a specialized building type. He argues that this bifurcation is unsustainable; that architecture as a profession suffers when its best-known practitioners are caught up in producing innovative design ideas but lack the means or desire to engage the messy process of seeing those works through to completion, while the remainder of architects are

mired in the day-to-day provision of technically competent but relatively anonymous work. He, like Fisher, argues that architects need to do a better job of explaining the true nature of their profession to the public.

Our research begins to look at the question of the most appropriate architectural education, building on the important work of the Boyer Report, by asking recent graduates of a highly ranked U.S. school of architecture a series of questions about their education and preparation for practice. The results garnered from this survey are a first step in assessing the present fit between architects’ education and their subsequent experience in practice, and in identifying aspects of curricula that might be improved.

METHODOLOGY

An Institutional Review Board-approved questionnaire was sent via email to 224 alumni graduating with a Bachelor of Architecture Degree from Virginia Tech’s School of Architecture + Design (VT A+D) in any semester of 2015 through 2017, of whom 53 responded. In this paper, we discuss data gleaned from the questionnaire, which was designed to answer the broad research question, “How do recent graduates perceive their architectural education after entering the profession?” Important sub-questions raised were “in what ways were recent graduates best prepared for architectural practice?” and, conversely, “In what ways were recent graduates least prepared for architectural practice?” In answering the free-response questions, alumni reflected on which topics they felt architecture schools should teach, and which topics were more appropriately learned during the internship phase of their careers.

A number of the questions were drawn from the Boyer Report. This document has left a lasting impression on generations of architectural faculty; it was well-designed, well-funded, and beautifully written. Our intention was not to quantitatively compare the responses from our smaller study to this far more sweeping contribution, but rather build on its carefully considered questions to address our specific concerns regarding the fit of training to practice, updating them with modern language where necessary. Further, by borrowing from this survey, and highlighting similarities or differences in trends and themes between 1996 and the present day, we hope to get a sense of where our alumni are situated in the historical context of this perennial question of how best to educate architects.

The survey was organized into three sections, following the structure of the “Survey of Architecture Alumni” used in the Boyer Report, as follows: “Personal Background,” “Academic Preparation for Architecture,” and “Connections to the Profession and Society.” For the sake of brevity, in this paper, we share general observations about the personal background of the respondents, followed by results from five of the eight questions in the “Academic Preparation for Architecture” section and two of the open-ended questions from the “Connections to the Profession and Society” section. Results

and conclusions from the remainder of the questionnaire will be shared in a forthcoming paper.

RESULTS

Personal Background

Twenty questions served to gather a picture of the demographic characteristics of the 53 respondents and their positions within their professional careers. The highest number of responses for any question was 50, suggesting perhaps that a few respondents opened the survey and answered a only a few questions. The age of respondents ranged from 23 to 28, with a median age of 25. Of 50 reporting, 48% were male, 50% were female, and 2% were another gender identity. 92% were U.S. citizens, and 92% reported that they were currently working in the architectural profession. A majority (59%) described themselves as an “unlicensed entry-level intern;” 62% had not yet taken the Architectural Registration Examination (ARE), while 32% were in the process of doing so. 87% of respondents who had not yet taken the exam replied that they either definitely (61%) or probably (26%) will take the ARE and get licensed in the future. None of the respondents was currently enrolled in a graduate degree program.

When asked “Overall, did the experience of attending architecture school make it more likely, or less likely, that you would pursue a career as a licensed architect?” the respondents were generally positive about their educations. 62% said that their educational experience made it more likely, 24% said neither more nor less likely, and 12% said less likely, to enter practice, while 2% were not sure. When asked “If you had it to do over again, would you still attend the VT A+D?,” 60% answered “Definitely yes,” and 30% answered “Probably yes,” while only 6% said “Probably no” and 4% were not sure. Subsequently, when asked “If you had it to do over, would you still attend any school of architecture?,” 40% said “Definitely yes” and 36% said “Probably yes,” while 8% said “Probably no” and 4% were unsure.

Finally, a prompt asking alumni to “Please rank the importance of the following reasons for entering the architecture profession” found that “Putting my creative abilities to practical use” was ranked first by 56% of respondents, far higher than any other reason. “The prestige of the profession” was the lowest-ranked reason, chosen first by none of the of respondents, and “Good salary prospects” was ranked first by only 2%.

Academic Preparation for Architecture

In this portion of the questionnaire, recent graduates responded to eight statements related to how their well their educations did, or did not, prepare them for the profession of architecture. We discuss five of these in this paper.

Statement One

The first statement in the “Academic Preparation for Architecture” section asked respondents to “Please indicate how strong or weak you consider the following areas of the

curriculum at VT A+D.” Results are shown in Table 1. The strongest areas identified were “design,” “building design,” “drawing skills,” and “architectural theory.” These are indicated in light gray in Table 1. The weakest-ranked areas of the curriculum were “professional practice,” “historic preservation/urban planning and conservation,” “computer-aided design,” and “writing skills” as indicated in dark gray in Table 1.

Statement Two

Another statement asking respondents to rank the degree and success of the curriculum in addressing different aspects of the discipline of architecture was posed as follows, “The curriculum at VT A+D focused adequately on:” with results tabulated in Table 2. Design was far and away the favored response, while only 43% of respondents felt that the practice of architecture was dealt with sufficiently.

Curricular area	Very Strong	Fairly Strong	Fairly Weak	Very Weak	Total
a) Architectural history	20%	61%	16%	2%	49
b) Architectural theory	42%	48%	10%	0%	50
c) Historic preservation/urban planning and conservation	2%	21%	53%	23%	47
d) Environmental technology	13%	52%	27%	8%	48
e) Environment and behavior	20%	50%	28%	2%	46
f) Professional practice (building economics, contract negotiation, codes, etc.)	2%	12%	46%	40%	50
g) Writing skills	4%	32%	47%	17%	47
h) Structures	22%	62%	16%	0%	50
i) Computer-aided design	12%	18%	54%	16%	50
j) Drawing skills	58%	38%	4%	0%	50
k) Building design	58%	40%	2%	0%	50
l) Design	80%	18%	2%	0%	50

Figure 1. Responses to the statement “Please indicate how strong or weak you consider the following areas of the curriculum at VT A+D.”

Question	Strongly Agree	Agree Somewhat	Disagree Somewhat	Strongly Disagree	Total
Design	98%	0%	2%	0%	49
The social sciences and traditional liberal studies	12%	55%	20%	12%	49
The technical aspects of building design	27%	43%	22%	8%	49
The practice of architecture	4%	39%	39%	18%	49

Figure 2. Responses to the statement “The curriculum at VT A+D focused adequately on:”

Statement Three

A question aimed at the design studio was framed as follows, “Design studio projects at VT A+D effectively integrated these areas of knowledge,” with results as shown in Table 3. Areas most effectively integrated were “aesthetic dimensions of design,” “effects of buildings on human behavior,” and “structural materials and their properties.” The least effectively integrated were “mechanical systems,” “building codes,” and “the practice of architecture,” though a slim majority (53%) of alumni agreed this last topic was effectively integrated.

Area of knowledge	Strongly Agree	Agree Somewhat	Disagree Somewhat	Strongly Disagree	Total
a) Aesthetic dimensions of design	84%	14%	0%	2%	49
b) Mechanical systems	0%	29%	48%	23%	48
c) Building enclosure systems	8%	63%	24%	4%	49
d) Structural materials and their properties	20%	65%	12%	2%	49
e) Urban needs and historic preservation	10%	35%	43%	12%	49
f) Building codes	2%	39%	27%	33%	49
g) Environmentally sustainable design	13%	65%	21%	2%	48
h) Effective communication with clients and users	16%	43%	27%	14%	49
i) Effects of buildings on human behavior	45%	35%	16%	4%	49
j) The practice of architecture	8%	45%	33%	14%	49

Figure 3. Responses to the statement, "Design studio projects at VT A+D effectively integrated these areas of knowledge."

Statements Four and Five

Beyond giving an indication of how prepared their educations had left them, alumni were also asked to rate their degree of agreement with statements designed to determine how much they desired or expected to be prepared for professional practice during school. The first of these stated, "Post-graduate internship, rather than school, is the best time for students to acquire most of the technical knowledge required for licensure and eventual practice." 67% respondents agreed. 68% of alumni agreed with the next statement, "As a requirement for a professional degree, students should be required to complete a final thesis project that integrates knowledge of structures, technology and professional practice as well as design."

Connections to the Profession and Society

Following the ranking survey questions, we asked five open-ended questions, two of which are reported here. We generated word clouds for these two questions as a simple means to visually display and identify themes which may be explored in the continuation of this work.

The first of the two questions was "For what aspects of practice did your education best prepare you?" The top five words mentioned (from most frequent to least frequent) were "design, thinking, building, critical, and solve." There were 38 separate responses to this question. Representative answers included the following: "Thinking critically about design decisions and being able to speak intelligently about design;" and "to be able to think through things I don't know how to do using [the] information I have. It prepared me to read/understand drawing sets, to solve problems, to design, to critique others, and to critique myself."

The second question was "For what aspects of practice did your education least prepare you?" The six words most frequently identified, again from most to least, were "practice, building, code, project, and construction." The word "practice" is included in this count even though it is in the question itself because it so frequently appeared as the answer, even a single-world answer, to the question. 37 individuals provided

responses to this question. Selected answers were as follows: "Building code, project coordination, 'real' constraints, sourcing materials, ARE/IDP, the majority of the profession that is not design;" and "professional practice, the business of architecture, necessary computer software knowledge."



Figure 4. Word cloud: "For what aspects of practice did your education best prepare you?"

DISCUSSION

Personal Background

From the results of the personal background questions, it is clear that the typical survey respondent was actively engaged in the profession, with a large majority planning to pursue professional licensure and many having already taken steps to do so. This conclusion is not necessarily generalizable to the broader population of architecture graduates, since it is possible that those alumni who remained in the profession were more motivated to take the survey. It is also possible that the current positive economic climate may have contributed to the high percentage of students remaining in the field. However, these results do indicate that the responses to the remaining questions were most likely not speculative, but rather reflected



Figure 5. Word cloud: "For what aspects of practice did your education least prepare you?"

the experiences of young interns actively engaged in architectural work. Alumni were overwhelmingly positive about architectural education in general and loyal to their alma mater in particular. The great majority of students ranked using their creative abilities as one of the chief reasons for entering the profession of architecture, a theme that was repeatedly valued in the rest of their responses, and one which their educations seemed best to satisfy. Boyer and Mitgang reported similar results in 1996, with 44% choosing using creative abilities, 2% prestige, and 1% good salary prospects as their primary reason for becoming architects.⁶

Academic Preparation for Architecture

Statement One

In the present study, the areas of the curriculum considered strongest were those involving design, drawing, and architectural theory, while the areas considered weakest were generally those important for practice, i.e. courses on practice itself, historic preservation/urban planning and conservation, computer-aided design, and writing skills. Similarly, Boyer and Mitgang found design to be rated as “strong” (very or fairly) by 92% of alumni; the next highest percentages of “strong” ratings were found in the areas of architectural history, structures, and drawing skills.⁷ In the full “Survey on the Education of Architects” accessed from the Boyer Center Archives (hereinafter “Survey on Education”) architectural theory was also found to be strong.⁸ The aforementioned areas are listed in descending order of “strength”, with all above 68%. Boyer and Mitgang found writing skills to be the weakest area (59% weak), followed by computer-aided design (53% weak),⁹ with professional practice, historic preservation/urban planning and conservation, and environment and behavior also considered “weak” areas by a majority of alumni in the “Survey on Education.”¹⁰ It is important to note here that computer-aided design was not as widespread in the 1990s as it is today. A key finding is that design was considered the mainstay of architectural education both 25 years ago and recently, while skill-based courses were ostensibly not given adequate attention at either time.

Statement Two

All but one respondent strongly agreed with the statement that the curriculum focused adequately on design, reinforcing findings from the first question. Again, the practice of architecture was ranked lowest, perhaps indicating a need for curricular review in this area. The authors of the “Survey on Education” asked a similar question about design, but in the negative; only 26% of alumni agreed that “the curriculum at this school spends too much time on design.”¹¹

Statement Three

In our study, design studio projects were seen as effectively integrating aesthetic and behavioral aspects of design, with structural materials and their properties also considered, while mechanical systems, building codes, and questions of practice were the most often seen as less effectively incorporated. Based on the preceding conclusions, it is not surprising that the aesthetic dimensions of architecture ranked far above all other

domains of knowledge. The school currently has no courses expressly focused on human behavior, at least from a scientific perspective. However, it is surmised that a strong curricular focus on architectural history and theory, with courses emphasizing the influence of architecture on aspects of the human experience, may have led alumni to rank this area highly. Structural materials and properties may have ranked highly due to three required structures courses along with four required courses in building materials and assemblies that give students ample opportunity to incorporate concepts introduced in these classes into their design studio work. The “Survey on Education” had a slightly different list of aspects, but aesthetic dimensions of design were similarly ranked highest (95% agreement), with building codes and mechanical systems ranked low (35% and 29% agreement, respectively). The practice of architecture was not included in this question in the “Survey on Education.”¹²

Statements Four and Five

The responses to statements in our questionnaire concerning whether or not students should be prepared for professional practice while in school were surprising. Two thirds of alumni thought that internships were the appropriate place to learn technical topics necessary for licensure and practice. Boyer and Mitgang found about the same percentage of alumni (60%) agreed that internship was the time for gaining this knowledge.¹³ Conversely, two thirds of the present study’s participants thought that final thesis projects ought to incorporate “structure, technology and professional practice.” Even more of the “Survey on Education’s” alumni respondents (89%) agreed with this statement.¹⁴ This last finding is unexpected, particularly in the present study, both because it seems to contradict the foregoing result, and also because at this particular institution, final, fifth-year thesis projects are generally not required to incorporate these elements. Most of these requirements are addressed in a semester of comprehensive design usually completed in the fourth year of the five-year degree program. Untangling this discrepancy will be a fruitful topic for further investigation.

Connections to the Profession and Society

Unsurprisingly, the responses to the open-ended questions tended to reinforce the findings from the survey questions. While teaching of design and critical thinking in school were applauded, professional practice in its many facets was seen to be lacking, though a few students noted that they had managed to glean key concepts and vocabulary while in school that had helped them in practice. Some saw the teaching of design to be a sufficient agenda for schools of architecture; one alumnus stated that he or she learned most about “design, which is good because it’s the part hardest to learn after school.” While most respondents saw the relative lack of engagement with the world of practice while in school to be negative, a few commenters found it to be appropriate, with one alumnus writing that he or she would have liked “more theory, more thinking, more daydreaming. Let us learn how to be a professional after we graduate.” One cynic reported that he or she had been least prepared in school for “the less exciting things

that any good office will spend time teaching you: code requirements regarding life safety, etc., Revit, [the fact] that you likely won't design again for 20 years..." There was an overarching sense that the skills learned in school had definite value, but didn't always reflect the world of practice after graduation, for better or for worse.

CONCLUSIONS AND CONTINUATION

The results of the questionnaire show that, in direct contrast to the words of a famous song, recent graduates can almost always get what they want out of their architectural education, but they might find that they don't get what they need. One response to the question asking about areas of practice for which alumni were least prepared sums up a situation relayed by multiple alumni:

It would have been helpful to understand the difference between the profession and the study of architecture. My experience of the architectural practice in a workplace do not reflect my expectations (assumptions) from school. While studio teaches how to design thoughtfully, sometimes mulling over ideas for an extended amount of time—I did not feel prepared for the fast pace of the profession. In addition, the importance of getting jobs and drawing a contract was significantly underplayed.

Broadly speaking, there is still a considerable divide between the academy and the office. It also appears, based on some of the alumni comments, that this divide might be inculcated in students during their time in school. If this divide is to be bridged, as we and others suggest, we ought to continue to determine how the academic discipline of architecture could be better attuned to the profession. This work should be done in conversation with as broad a swath of stakeholders as possible, through a robust and in-depth series of interview questions of alumni, faculty, professionals, and current students, to further explore these themes and determine how architecture programs and their curricula might be transformed. In 1996, Boyer and Mitgang proposed in their epilogue that "architecture education and the profession, as part of an enriched partnership, should collaborate to develop new knowledge aimed at ensuring that the impact of design decisions on the health, safety, and welfare of communities is better understood."¹⁵ This conclusion, advocating cooperation between schools and offices in service of creating architecture that engages real-world parameters, still rings true.

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ENDNOTES

1. National Council of Architectural Registration Boards, "NCARB by the Numbers," National Council of Architectural Registration Boards, <https://www.ncarb.org/sites/default/files/NBTN/NBTN2019.pdf>.
2. <https://www.dezeen.com/2019/08/02/architecture-education-opinion/>.
3. Ernest L. Boyer and Lee D. Mitgang, *Building Community: A New Future for Architecture Education and Practice: A Special Report* (Princeton, N.J.: Carnegie Foundation for the Advancement of Teaching, 1996).
4. Thomas Fisher, *In the Scheme of Things: Alternative Thinking on the Practice of Architecture* (Minneapolis: University of Minnesota Press, 2000).
5. Eric J. Cesal, *Down Detour Road: An Architect in Search of Practice* (Cambridge, MA: MIT Press, 2010).
6. Boyer and Mitgang, *Building Community: A New Future for Architecture Education and Practice: A Special Report*, 9.
7. *Ibid.*, 68.
8. "Survey on the Education of Architects," in *The Ernest L. Boyer Center Archives* (Mechanicsburg, Pennsylvania, USA: Messiah College, 1994).
9. *Building Community: A New Future for Architecture Education and Practice: A Special Report*, 69-70.
10. "Survey on the Education of Architects."
11. *Ibid.*
12. *Ibid.*
13. *Building Community: A New Future for Architecture Education and Practice: A Special Report*, 116.
14. "Survey on the Education of Architects."
15. *Building Community: A New Future for Architecture Education and Practice: A Special Report*, 147.