

# “Why Do We Need an Engineering Library?”: Designing Team-Based Liaison Services for STEM Educators and Researchers

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**abstract:** Liaison (or subject specialist) librarians are routinely identified as essential to the sustained success of academic libraries. Yet despite the purported centrality of liaisons to the mission of their institutions, many libraries have struggled to define the role of the subject specialist. These attempts at definition have resulted in a proliferation of service models and deployment strategies. This paper examines and critiques the design and deployment of subject specialist services in science and engineering libraries. The authors advocate for a team-based approach to STEM librarianship, highlighting its advantages over two commonly used models: the discipline specialist and the functional specialist. The authors have successfully employed a team-based model in two different institutional settings, most recently at Vanderbilt University in Nashville, Tennessee. This paper shares lessons learned from implementing a team-based model, discussing the opportunities and challenges of such an approach.

## Introduction

Liaison (or subject specialist) librarians bring the library directly to users, showing students practical ways it can support their success while also demonstrating to faculty and university administrators how the library can serve as a partner in the educational and research missions of the university. Liaison positions and their outward focus on community building are particularly important in science, technology, engineering, and math (STEM) disciplines. STEM curricula rarely include inquiry-based assignments that lend themselves to information literacy instruction opportunities, and research in these fields occurs in laboratory settings far from the stacks and carrels of the physical library. For STEM users, “Why do we need libraries?” is not a rhetorical question; rather, it is

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a genuine, existential inquiry that subject specialists must be equipped to address. The answer requires them to provide relevant, value-added teaching and research support services in a strategic, sustainable manner.

The nature of subject specialist librarian responsibilities means that they must be successful in a consistent and measurable way, which has placed pressure on how these duties are conceived and deployed. The design of most liaison positions makes them individualistic—liaisons are often encouraged to develop their own approaches, and as a result, differences inevitably emerge. Every library has liaisons who are viewed as successful and those who are less so, as well as liaisons who are interested in learning new skills and those who prioritize more traditional roles and responsibilities. Managers and administrators have struggled with how to achieve greater and more uniform success, and to realize a better return on this large staffing investment.

This paper discusses three service models currently in use in academic libraries, tracing how they have evolved, as well as their relative strengths and weaknesses. The phrase “liaison model” is used to describe the traditional subject specialist model, in which every subject discipline has an assigned librarian. The phrase “functional model” refers to the functional specialist model, in which positions are built around specialized skills, such as data management, copyright, or bibliometrics, and are offered broadly to the whole campus or institution. This model ostensibly provides library administrators with a means of addressing new service needs and emerging campus priorities without having to reskill an entire staff. However, both the liaison model and the functional model produce a siloed effect, in which persons or groups do not share information and resources with others in the institution. One model compartmentalizes librarians by subject, the other by skill set. Consequently, both can produce many of the same problems, which this article will identify and discuss in-depth. Following a discussion of these two widely adopted approaches to staffing, the authors will introduce their team-based model, which prioritizes the development of relationships across campus through strategic, coordinated engagement. The authors will suggest that a team-based model addresses the major liabilities of the liaison and functional models, while preserving the strengths of both that are critical for serving STEM researchers effectively.

### Literature Review

The traditional liaison model began to emerge in the late 1970s, as academic libraries attempted to react to new information technologies that seemed poised to dislodge the library from its position as the “primary information agency on campus.”<sup>1</sup> While direct interactions with users were already a core component of reference librarianship, liaison service models distinguished themselves from previous user-focused activities through the creation of more formalized, comprehensive, and structured approaches to public services work.<sup>2</sup> This pivot toward systematic liaison programs was accompanied by declining discretionary budgets for print materials and reduced reference interactions across many academic libraries.<sup>3</sup> With less time needed to review purchase orders and to staff physical reference points, by the mid-1990s libraries began to experiment with blending the roles of collection management, teaching support, and research assistance to foster deeper connections with faculty and academic units.<sup>4</sup> By the turn of the century,



the role of the subject librarian had shifted from a collection-oriented position into a user-oriented one as subject specialists spent less time developing print collections and more time managing relationships with academic units.<sup>5</sup>

As these changes unfolded, library administrators concurrently looked for ways they could demonstrate and quantify the impact of their services on campus outside of physical library spaces. In particular, they sought to measure how academic libraries could more directly advance what Scott Walter described as institutions' "signifiers of excellence" through enhanced teaching and learning experiences for students and increased productivity for researchers.<sup>6</sup> This change in mission placed greater importance on librarians becoming involved in outward-facing activities, which meant the new blended selectors and reference librarians needed to become more actively involved in outreach efforts. The impact of this shift is perhaps best exemplified in librarians transitioning their teaching practices away from bibliographic instruction programs that emphasized library skill development<sup>7</sup> and instead focusing on building information literacy programs that could be integrated strategically into the curricula of academic departments.<sup>8</sup>

Judging by how library staffing models developed over the course of the 2000s and by what is reflected in the accompanying professional literature, what became known as the "liaison model" was a wild success. By 2009, in her introduction to a special issue of the Association of Research Libraries (ARL) journal *Research Library Issues*, Karla Hahn argued that the liaison model had become "central to fulfilling the library's mission in a digital age."<sup>9</sup> However, Hahn also observed that many within the field had begun to point out limitations in this staffing plan. They noted a need to "reconfigure liaison work" to meet the changing needs of students and researchers in such areas as enhancing teaching and learning, curating science and engineering data, and supporting emerging forms of scholarly communication.<sup>10</sup> Others questioned the sustainability of this model, noting that new roles were being added to liaison positions without a corresponding number of duties being removed.<sup>11</sup>

Nine years later, *Research Library Issues* published another special issue, again wrestling with the emerging configurations of the liaison model.<sup>12</sup> Whereas the 2009 special issue advocated for folding new roles into the traditional liaison model, the 2018 special issue's case studies provided examples of institutions electing to deconstruct the liaison model into separate functional parts. For example, administrators at the University of Guelph in Guelph, Ontario, Canada, concluded that subject expertise was less uniquely valuable on campus than functional expertise was. The university elected to assign previous subject specialists into four functional areas: collection development, instruction and curriculum support, information discovery and access, and scholarly communications.<sup>13</sup> Administrators at the University of California, Riverside adopted a similar approach, transitioning from a liaison model to a functional one where librarians were organized into three operational departments: Teaching and Learning, Research Services, and Collection Strategies.<sup>14</sup> However, even these advocates of the functional model acknowledge that it can lead to multiple and sometimes competing lines of communication with campus stakeholders. As Guelph librarians Matthew J. D'Elia and Doug Horne explain, "A faculty member might connect with an information literacy librarian about courses, a collections librarian about new electronic resources, and a research and scholarship librarian about research data management."<sup>15</sup>



Catherine Hoodless and Stephen Pinfield thoroughly investigate this tension between the traditional subject-based library organization and the emerging functional one.<sup>16</sup> Through interviews with library administrators who had moved to a functional model or were considering doing so, Hoodless and Pinfield identify several perceived

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benefits and possible limitations to the functional model. Library administrators viewed the functional model as a means of providing a consistent deployment of services across disciplines and departments; developing new expertise in emerging service areas, such as data management, bibliometrics, or data visualization; aligning the library's organization structure with institutional priorities;

and changing perceptions of the library among both internal and external stakeholders. To better engage with all stakeholders, librarians need to find ways to offer consistent services even to users who never enter a physical library space.<sup>17</sup> With many researchers no longer identifying the library as intersecting with their workflows, it is important for librarians to develop services that will create engagement opportunities across the research life cycle.<sup>18</sup> Many academic librarians report, however, that keeping up with the demands of their current roles prevents them from pursuing the continuing education opportunities needed to offer these types of data-intensive research services.<sup>19</sup>

Yet, there are reasons to question whether this shift toward a functionally organized library is the best way to achieve these goals. Many libraries that have embraced the functional model divide liaison responsibilities and services into two distinct categories: (1) research assistance and (2) teaching and learning services. The underlying logic is that these groupings elucidate the types of services the library offers and package them in way that is more user-centered.<sup>20</sup> Yet evidence suggests that, at least for STEM researchers and educators, this division may create even more confusion. In STEM fields, research and teaching activities not only complement one another but also are inextricably linked and happen concurrently.<sup>21</sup> For example, a principal investigator in charge of a lab is not just concerned with research productivity but also responsible for teaching the students to become researchers. For these users, we might expect that creating divisions among who in the library can offer guidance on designing an inquiry-based assignment and who can provide feedback on a graduate student's data visualization might create not just confusion but also exasperation.

Other concerns about the functional model exist, as well. While functional models may facilitate the development of partnerships with nondepartmental units on campus, such as research offices and centers for teaching, this potential benefit is counterbalanced by the risk of losing strong connections with academic units. Liaisons' ability to form such bonds makes them key personnel, and these relationships represent significant social and relational capital that enables and encourages mutually advantageous cooperation within an institution of higher learning.<sup>22</sup> Some institutions that have implemented a functional model report that disciplinary faculty respond negatively to the loss of a dedicated subject

specialist, fearful that this change will result in reduced service offerings.<sup>23</sup> Consequently, library administrators should be cautious about staffing changes that may jeopardize such valuable relationships. Moreover, while a transition toward a functional model may promote more consistent service deployment, this shift also moves the library toward service offerings that are not customized by subject or discipline. While these offerings may assist with providing research assistance at scale, what they gain in efficiency may come at the expense of effectiveness. Education research suggests that training and services are most effective when they feature meaningful contexts that authentically resonate with their intended audiences,<sup>24</sup> and the same holds true when creating opportunities for engagement with users in an academic library setting.<sup>25</sup>

In an interesting contradiction, some of the library administrators interviewed by Hoodless and Pinfield indicated that they implemented the functional model in hopes of using it as a catalyst to spark broader cultural changes within the organization.<sup>26</sup> This suggests that, for at least some of these libraries, these reorganizations may not have been grounded in a broader strategy or any proven ineffectiveness of the subject-specialist model. Given the significant costs associated with any major reorganization,<sup>27</sup> the perceived value of the subject-specialists by both internal and external stakeholders, and the potential limitations of the functional model noted earlier, one might assume that these changes were grounded in firm evidence or were at least accompanied by a purposeful vision of what success would look like and how it would be measured.<sup>28</sup> Yet in fact, Hoodless and Pinfield note that, while functional models are often viewed by their adopters as successful, "There is little reported evidence concerning the effectiveness of using functional teams over subject-based teams."<sup>29</sup> In other words, the shift to the functional model may be less strategy-driven and more change for change's sake.

But while the increased value and effectiveness offered by functional models remain in doubt, the reasoning behind exploring the functional approach is nevertheless well-founded—problems abound with the liaison model as currently configured. Jennifer Church-Doran provides the most compelling recent analysis of the limitations with the liaison model, noting that it asks librarians to do the near impossible. "It is unrealistic," she says, "to think that one person could or should possess the diverse range of skills or the extensive time required to [deliver] all possible services, in all categories, across every assigned constituency, and then proceed to operationalize each into an ongoing service program."<sup>30</sup>

To try to achieve that lofty goal, academic libraries often dedicate a large proportion of their staff to liaison programs. Allocating so many professional librarians to these programs means that they represent one of the most substantial investments of human resources made by academic libraries.<sup>31</sup> Yet, because much of the benefit provided by liaisons is intellectual capital, valuable but intangible assets such as knowledge and

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expertise, academic libraries frequently struggle with demonstrating the worth of their liaison services.<sup>32</sup> This effort to demonstrate the value that academic libraries create for institutions of higher learning has created significant challenges for both local institutions

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as well as professional organizations such as the Association of College and Research Libraries.<sup>33</sup> Furthermore, the liaison model often creates an environment where managers struggle to hold staff accountable for accomplishing goals or improving on service offerings.<sup>34</sup> Library administrators who adopted functional mod-

els have reported that they did so in part because subject specialists are “pretty ineffective,” noting that “under performing staff can hide” because of a lack of accountability within the liaison model.<sup>35</sup> While a lack of oversight by management may be acceptable at institutions where liaison services are widely understood and utilized by their respective user communities, the literature is rife with reports of researchers’ shallow and limited understandings of library services.<sup>36</sup> Taken together, this suggests that the liaison model, while capable of producing worthwhile intangible assets and viewed as

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One of the main selling points of the liaison model for users is that they get a personal librarian. This personal librarian is depicted as someone who is attuned to their disciplinary needs and who can serve as a friendly face for what might otherwise be an

intimidating university library system. However, as a result, the services available to students and researchers in an academic unit may be completely contingent upon the expertise possessed by their liaison librarian. The functional model is built in response to this limitation, redeploying specialists in a manner that makes their knowledge available to all members of a campus community, regardless of discipline. However, Hoodless and Pinfield note that, for most institutions, the discussion of liaison versus functional models is a false dichotomy—rather, “most library structures consist of a *balance* between both functional and subject-based elements.”<sup>37</sup> Corral notes that this balance of both functional and liaison is not a new development; even at libraries with long-standing histories of subject bibliographers, such departments as acquisitions and circulation have traditionally been organized functionally for decades.<sup>38</sup>

Some libraries have implemented a hybrid or matrix service model, in which subject-specialists retain their departmental liaison duties but have functional responsibilities as well.<sup>39</sup> Examples of functional areas that may be folded into a liaison’s regular duties

include research data management, scholarly communication, copyright, and pedagogy. In hybrid models, liaisons are also expected to refer their users to dedicated functional experts as needed. Yet the hybrid model also presents its own unique challenges. Not only do users report lower satisfaction when interactions result in a referral rather than answered questions,<sup>40</sup> but also the reliance on referrals violates the first principle of the liaison model—that community members must only know the name of their “personal” librarian to get the assistance they need when they need it.

If the liaison, functional, and hybrid models all prove unsatisfactory, this raises the obvious question of whether the role of a public-facing service specialist is still worthy of the library’s investment, and if so, how should these types of positions be configured? Lorcan Dempsey contends that this type of public-facing role is key for libraries to make the “shift to engagement,”<sup>41</sup> in which libraries transform from passive repositories of knowledge into connected hubs of innovation and collaboration. To do so, Dempsey suggests that librarians in these roles must have positions that are both strategically designed and locally responsive to the needs of an institution’s students and researchers. We suggest that our team-based approach to teaching and research services offers a means of meeting both of Dempsey’s requirements, effectively blending the positive aspects of the dedicated liaison and the functional specialist without the reliance on referrals that plagues the hybrid model.

### Our Service Model and Institutional Context

The authors developed the mechanics of the team-based approach over 20 years, beginning at a different institution, where it initially evolved from necessity: that of a small staff of librarians trying to reach a large number of engineering users who were geographically distributed across multiple physical campuses.<sup>42</sup> Working under these constraints, it quickly became clear that librarians had to work together to create a coherent service model and that strategic goals had to be defined by the group collectively. In this model, each member of the team began to serve the same disciplines, which resulted in the creation of a team of librarians who were more specialized than generalist reference librarians, yet more generalized than single-subject specialists. In other words, instead of someone serving as the civil and mechanical engineering librarian, that person worked as an engineering librarian on a team of engineering librarians.

Over time, some unintended benefits of this team-based approach became clearer. In addition to mitigating the siloing effect of the specialist models through the creation of more col-

laboration opportunities, this approach was also more authentic because it moved away from the myth of deep subject expertise (which few subject specialists really have). Many academic libraries advertise that the library has a specialist for every subject taught on campus. But in practice, the library does not have individual liaisons for each discipline;

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rather, liaisons (and STEM liaisons especially) are assigned half a dozen or more academic fields, in which they may have relevant training in one or two. The team-based model recognizes that specific content mastery in an academic discipline is less important for providing excellent library service than is familiarity with the processes of how that discipline conducts research. For example, a science librarian need not necessarily know how to design a bridge to help civil engineers find engineering standards on how to build one, but she will be well served by understanding how engineers develop hypotheses, interpret primary literature, and visualize data.<sup>43</sup> Crucially, these scientific processes transfer between disciplines much more readily than specific content mastery does, meaning that a librarian familiar with the processes of research and inquiry in one STEM field will be well-equipped to support users in other STEM disciplines as well. As such, the team-based model not only recognizes what many subject specialists and functional specialists really do day to day (working at a more macro level with a wider set of related subjects) but also highlights the transferability of the core skills of science librarianship.

Vanderbilt University in Nashville, Tennessee, is a private research university with approximately 13,000 students, including undergraduate, graduate, and professional degree-seeking students. The Vanderbilt University Libraries are made up of nine campus libraries, one of which is the Stevenson Science and Engineering Library. The Science and Engineering Library serves the Vanderbilt School of Engineering as well as all the science and mathematics disciplines housed in the Vanderbilt College of Arts and Science. The librarians in the Science and Engineering Library began the transition from a traditional liaison model to a team-based model in 2017 with the arrival of a new library director.

In 2017, the Science and Engineering Library had four liaison librarians, one library director, and two support staff. The library served 10 departments in engineering, the sciences, and mathematics, divided among the four liaisons in the traditional liaison model. Typically, each liaison was responsible for outreach and instruction, reference, and collections spending for an assigned department. In this configuration, the library director was not utilized as a subject specialist. Services and collections to the various departments were imbalanced and uncoordinated, largely defined by the individual styles and preferences of their assigned liaisons. There were few faculty relationships, especially in the engineering disciplines, and corresponding instruction and reference statistics were low. In an early meeting with the dean of engineering, the new library director was asked pointedly, "Why do we need an engineering library?" While much of this situation was brought about by local factors (including individual personalities, choices, and behaviors), the decentralized, ad hoc service model that accompanied the subject liaison staffing model enabled and exacerbated it. The team-based model, where goals are clear and librarians are accountable to one another, was identified as a quick way to recovery.

The transition to a team-based approach was initiated by instituting more collaborative practices, including monthly librarian meetings to work on a service model and identify shared goals. The first objective was to contact and meet with every STEM administrator: deans, associate deans, department chairs, and coordinators of graduate and undergraduate programs. Over the ensuing six months, the next steps were to follow up on the action items that came out of these meetings and to begin planning and





implementing a curriculum-integrated instruction program. Perhaps not surprisingly, even these seemingly small steps contributed to staff attrition, with all four librarian positions becoming vacant over a span of two years. While these vacancies slowed progress in some areas, they enabled other parts of the transition to advance. Of necessity, the remaining staff needed to get comfortable covering other disciplines, and the library director had to serve as a liaison. Conducting a search to fill the vacant positions provided the opportunity to rewrite all four job descriptions. Position titles were changed from “librarian for subjects x, y and z” to “librarian for STEM research,” and job descriptions and duties were made identical (see the job description in the Appendix). We also capitalized on the period of vacancies to renovate the office spaces into an open configuration with meeting space to reinforce the idea of teamwork, and to redesign old workflows using collaborative tools, such as Microsoft 365, which includes word processing, financial spreadsheets, presentation software, video chat, and cloud storage.

By early 2019, two new librarians had been hired, and the team could move forward with building programs and delivering liaison services. All the librarians, including the library director, work together as a team. The traditional liaison work that would be done individually, such as research services, collection management, and scholarly communication, is designed and delivered holistically and collaboratively. Leadership within these given areas is distributed throughout the team and rotates among team members every two years. One librarian serves as instruction coordinator, leading the team in planning and delivery of the curriculum-integrated instruction program, while also sitting on a Vanderbilt Libraries-wide instruction council. Another librarian coordinates collections decisions. This individual is responsible for spending the library’s one-time funds in all subject areas, leading regular team meetings to make decisions involving the serials budget (including renewals, cancellations, and major purchases), and serving on a Vanderbilt Libraries-wide collections council.

The team has focused on building relationships with faculty in all 10 departments; meetings with administrators in the STEM disciplines have become a part of the regular yearly workflow. Outreach for the instruction program, which served over 1,600 students in the 2019–2020 academic year, has

also fostered new relationships with dozens of faculty. New programs and events in the library space, such as faculty development workshops and career seminars for STEM majors, have led to partnerships and other “new business” coming to the library team. While a dedicated liaison would have many of the same goals, the team-based model creates

a better framework for achieving those objectives through the creation of a consistent service model across all disciplines served and shared goals that group members are accountable to one another for achieving.

The team has successfully taken many first steps in key areas for strategic engagement. However, the culture change is still in the fledgling stages and must continue until

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a new norm is achieved. Two vacant librarian positions remain to be filled, and good habits such as daily communication and collaborative practice must be routinized. The transfer of responsibilities and faculty relationships from one librarian to another—a major component of the team-based model—has yet to take place, and it remains to be seen how this handover will be received. In short, much has been achieved, but there is still work to complete the transition.

### Challenges and Features of Successful Implementation

There are some key elements to creating a successful team-based liaison model. The group must take the time to articulate a shared vision, as well as the service model and the goals that follow. Establishing common objectives requires effort from both the leader and the team members, often in the form of retreats or planning meetings to get everyone on the same page. Communication is extremely important. Team members need to meet regularly and speak with each other almost daily. Lastly, workflows and infrastructure must be designed to facilitate everyone's participation. Cloud-based and collaborative file creation and management are ideally suited for this type of work environment.

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of the most important parts of the job. With the team-based model, relationship building becomes even more important, especially when developing programs and services. The group must adopt consistent approaches and standards so that users have a seamless experience and feel connected to the whole team. Everything from modes of communication to standards of professional behavior should be considered and discussed by the group.

For librarians, a transition to a team-based model may include some significant changes to their approach to librarianship, both in terms of philosophy and actual workflows. These adjustments include letting go of “owning” individual departments and relationships, and may mean changing how and when some tasks are performed.

Even communicating regularly with teammates may feel unusual for someone who has worked independently for a long time. Daily, intensive coordination and communication may feel inefficient, but strategic planning requires them; achieving the gains associated with having an agile team means taking time to do some things differently.

One obvious question associated with the team-based model is whether it creates confusion or distress for users who are accustomed to a personal librarian and may be left wondering who “their librarian” is. However, sufficiently engaged team-based librarians can quickly resolve this issue (if it arises at all). When serving STEM disci-



plines, most libraries build their business not through users seeking out their librarian but by direct engagement and referrals. If the team routinely conducts strategic and persistent outreach, such as meeting regularly with the respective deans, department chairs, curriculum coordinators, directors of graduate studies, and faculty teaching core courses, then over time, library users begin to know the entire team and become comfortable contacting any member. Another potential issue relates to the periodic transfer of relationships and responsibilities; this process must be done thoughtfully, ensuring that positive relationships are built upon rather than diminished and that each teammate delivers high-quality work.

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The team-based model requires active management, especially regarding the rotation of roles, responsibilities, and relationships. This oversight is critical to prevent the formation of unintentional siloes. The person who has a particular interest or skill could unintentionally turn into a functional specialist if the manager does not make sure that others can also pick up that expertise (and provide related services). Likewise, the librarian with a chemistry background should not always work with the chemistry faculty or teach the chemistry students. The manager must meet the challenge of making sure those duties rotate every year or so. The best way to exchange responsibilities is for the team to look at services in aggregate once or twice a year. For example, the team can meet to review the curriculum map of every course, whether they provide curriculum-integrated instruction or not, to develop a strategy for next steps and to rotate teaching responsibilities so individuals do not teach the same class more than one or twice in succession.

## **The Case for a Team-Based Model**

### **More Equitable and Consistent Services**

The team-based model removes the compartmentalization problem of traditional liaison and functional models, ensuring greater consistency across departments and programs. Services are planned across all the STEM disciplines together. Ownership is shared, and team members together set goals, create plans, and execute them. Each member has specific responsibilities, but these duties shift periodically to create a shared base of knowledge and experiences. Perhaps most significantly, these periodic transfers include handing-off faculty relationships so that faculty know more than one librarian.

### **More Sustainable Relationships**

From the perspective of librarians in a liaison role, engagement with their assigned departments represents the most time-intensive activity of their job, with successful research or instruction programs taking years to develop. While this process can result in effective partnerships, a single-point-of-contact model is double-edged for the library; an academic library risks losing that time investment and relational capital if a liaison leaves for another job or is promoted into a new role.<sup>44</sup> Relying on one-to-one relation-



ships means that every connection between a community member and the academic library is precarious.

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In the team-based approach, community members have a one-to-many relationship with the staff of the library, making this connection less dependent upon a single liaison remaining indefinitely in an assigned departmental role.<sup>45</sup> By creating relationships with more than one staff member, community members can connect with their academic library as an institution, rather than only associate with their assigned liaison. This approach, in turn, creates more sustain-

able relationships between academic faculty and the library, transforming associations based on threads among individuals into relationships featuring a network of multiple connection points.

### **More Equitable Workloads**

Because of the idiosyncratic nature of the personalities of different academic departments, as well as varying curricula and research methodologies, the liaison model almost inevitably leads to uneven workloads. Two librarians adopting the same outreach strategies at the same institution may achieve starkly different levels of success in relationship building and program development. While one department may quickly recognize the value of information and data management and respond enthusiastically to building inquiry-based assignments into major courses, another may be more protective of its students' class time. The team-based model recognizes these disparities and distributes work with "high-touch" departments among the entire team.

Onerous or repetitive tasks, such as grading student assignments or clicking through approval plans, can be rotated and distributed among the team members over time. Sharing these types of chores may help mitigate or prevent burnout, a chronic state of emotional exhaustion that leads to a vicious cycle of demotivation, further exhaustion, and decreased performance.<sup>46</sup> While the potential downstream effects of burnout may be more directly apparent in sectors such as health care,<sup>47</sup> for professions like librarianship that often fall within the crosshairs of austerity measures, even moderate downturns in productivity can have substantial long-term consequences.<sup>48</sup> While moving toward a team-based approach cannot single-handedly change the structural barriers created by the one-shot model of teaching information literacy, or excise the emotional labor endemic to a service profession like librarianship,<sup>49</sup> our approach may mitigate some of the more extreme aspects of these challenges. By intentionally grouping subject specialists into teams, the team model creates a more supportive environment where time-intensive tasks such as class preparation and learning outcomes assessment, or cognitively taxing jobs such as reviewing a multiyear renewal offer for a journal package, can be completed collaboratively with other colleagues.<sup>50</sup>



### More Effective Professional Development

By making the team model explicit, librarians are exposed to new tools and new skills from one another over time. This leads to greater consistency in the skill set across the team, which prevents the skill siloing that often occurs in organizations that utilize the functional model. In a successful team-based model, the team decides on core service offerings and commits collectively to make sure everyone can provide all the services in the team's portfolio. This approach helps hold librarians accountable for professional growth and keeping their skills sharp. When the group decides to learn something new to all, they can do that together, making it less intimidating. Examples may include using the Open Science Framework, a software project to make scientific research and data more accessible, adapting an open learning management software in for-credit courses,<sup>51</sup> or learning how to use statistical tests such as analysis of variance (ANOVA) tests to assess differences in student performance.<sup>52</sup> In this way, the team-based model begins to resemble Étienne Wenger's idea of a community of practice, in which practitioners engage in co-learning and develop shared approaches to common challenges.<sup>53</sup>

### More Effective Succession Planning and Onboarding

The team model enables agility and provides for succession planning to reduce the impact of the loss of individual team members. Responsibilities can be easily rearranged, and less time is spent trying to figure out how a former colleague did his or her job. The model also makes it easier for new staff to acclimate into the team. Rather than starting from scratch, they inherit successful relationships that they can maintain while they settle into their new role. The constant communication that is part of any good team provides a natural learning environment, and group goal planning provides the context so essential for successful onboarding of new staff. Crucially, the team approach may make it easier for librarians from non-STEM backgrounds to excel in a STEM role; without the pressure to be the only "expert" in a field from day one, these information professionals can grow into the role of supporting STEM communities over time.

### More Effective Management

The liaison model, in which individual librarians identify their own priorities based on their interpretation of their assigned departments' needs, creates substantive challenges for managers. This ad hoc approach prevents managers from tracking such inputs as collections funds, outreach, programming, and instruction programs; from comparing outputs across team members; or from studying trends to determine what services or strategies to invest in further.<sup>54</sup> From the perspective of frontline librarians, this model also inhibits receiving useful feedback because their department head may have little or no direct

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**Success is measured by the group's combined achievements, so stronger performers have a reason to help their teammates succeed, and weaker team members have support and successful models to follow.**

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insight into whether their yearly goals and accomplishments were appropriate given their assigned user communities. The team-based model makes it easier for managers to plan strategically, creating centralized goals and accountable benchmarks for team members to meet. It also provides frontline librarians with clear, measurable objectives that they know will be valued by their department head. There are no “stars,” only leaders and mentors. Success is measured by the group’s combined achievements, so stronger performers have a reason to help their teammates succeed, and weaker team members have support and successful models to follow.

### Conclusion

The subject specialist is one of the most important and potentially valuable roles in an academic library. However, the way these positions have traditionally been designed and managed, in which liaisons follow their own styles and preferences, leads to outcomes that may or may not align with the mission and goals of the department and larger organization. These traditional methods have led to inconsistent results, causing library administrators to “give up” on these positions and move toward the functional specialist model. Yet these same root problems—a lack of strategic service models to work in and insufficient coordination among staff—similarly impact functional specialists and hybrid specialists. Without the creation of shared understandings and common priorities, service silos and highly specialized program offerings that do not translate across staff members inevitably emerge, either along disciplinary lines or along functional skill sets.<sup>55</sup> In contrast, the team-based model is a true service model—it transcends the individuals involved to exist on its own and allows subject specialists to do what they do best and create something that will outlast their tenure. In library services to STEM disciplines, where engagement efforts are so critical and hard-won, the team-based model is an effective way to maintain and grow faculty relationships.

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## Appendix

### Job Description for Positions in the Team of STEM Librarians

**Working Title: Librarian for STEM Research**

**Home Department: Vanderbilt University Libraries**

#### *Position Summary:*

The Stevenson Science and Engineering Library is part of the Vanderbilt University library system. The librarian for STEM research provides research and teaching support to faculty and students in the Vanderbilt University School of Engineering as well as all the science disciplines in the College of Arts and Science.

Working as a member of a team of STEM librarians, the librarian for STEM research will work collaboratively to plan and deliver research support services to faculty and students. This will be done through active and systematic engagement with faculty and students in their offices, classrooms, and laboratories.

#### *About the Work Unit:*

The librarian for STEM research works in the Stevenson Science and Engineering Library, one of the campus libraries within the VU Libraries. It is the only library open 24 hours per day and is the busiest library in the system. Located in Stevenson Center, the library's primary user base can be found within the Stevenson Center complex, Featheringill Hall, Buttrick Hall, Olin Hall, and the Wondr'y.\* Support staff manage the day-to-day operations of the library facility, while the librarians focus on delivering services to science and engineering users in locations across campus. They visit faculty and students in their offices, classrooms, and laboratories, providing instruction and consultations that support research and coursework. The librarians work closely as a team, planning and delivering services to their constituents and making collections decisions together.

The Vanderbilt Libraries are fundamental to the university's goal of advancing scholarship and learning. We collect, preserve, and make accessible a wide variety of resources; we partner with faculty and students to shape research; and we encourage the development of informed scholars and engaged citizens.

#### *Key Functions and Expected Performance:*

- Collaborate with team members to develop and implement a service model for engineering and the sciences that will result in deep library engagement across all science and engineering disciplines.
- Actively engage with faculty and students in their classrooms, offices, and labs to bring librarian expertise to users where they work.
- Develop programs and offerings to provide expert research support at all stages of the research life cycle.
- Help build and deliver an information literacy program that is integrated into the curriculum to create scientists and engineers who are sophisticated users of technical information and data.



- Contribute to collections strategies that are sustainable and responsive to user needs.
- Develop and deliver innovative consultation services drawing on established and emerging computational research methods.
- Represent the library locally, regionally, and nationally.
- Actively contribute to the library science profession in the areas of science and engineering librarianship.

#### *Supervisory Relationships:*

This position does not have supervisory responsibility; this position reports administratively and functionally to the director of the Science and Engineering Library.

#### *Education and Certifications:*

- Master's degree in Library and Information Science from an ALA-accredited institution.
- Additional degree in a STEM discipline.

#### *Experience and Skills:*

- 0–5 years' experience in an academic research library.
- Outstanding communication skills and a demonstrated ability to effectively teach and present.
- Knowledge and/or interest in using emerging technologies to enhance the delivery of information services.
- Demonstrated ability to work independently and collaboratively on teams.
- Ability to manage multiple priorities in a fast-paced and changing environment.

The following are preferred:

- Experience working as a science or engineering subject specialist in an academic research library.
- Knowledge of current research practices and issues, including data science, open science and open research, research impact, data visualization, etc.
- Experience writing grant proposals.

#### *Key Characteristics of a Successful Team Member in this Work Unit:*

- **Creative Thinking**—Goes beyond the boundaries of the job description, willingly takes on new challenges, finds creative solutions rather than always awaiting direct instructions.
- **Helpful Nature**—Offers to help lighten the load for others in times of need. Volunteers rather than waiting to be asked. Understands that almost no one works in a silo and [everyone] needs the help of others to do their job well; recognizes that by helping others first, others will likely reciprocate.

- **Optimistic**—Is friendly, tirelessly cordial, polite, and genial. Comes in to work with a good attitude and doesn't bring their own personal "little black clouds" into the work environment.
- **Reliable**—Does what they say they will do, when they say they will do it. Shows up for work when expected. Doesn't push the burden of work volume or deadlines to others.
- **Teamwork**—Genuinely values teamwork and coworkers; make[s] them feel valuable and important by acknowledging what they do well. Doesn't expect from others effort that one is unwilling to do themselves. Finds ways to acknowledge others' strong suits.

\*The Wond'ry offers makerspaces and programs to promote innovation.

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