Associate Fellowship Program Curriculum Recommendations

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Contents

Structured Abstract

Objective

The Associate Fellowship Program fosters career development for early career health science librarians through a program of structured curriculum, networking, project work, and professional development. Recent organizational changes at NLM, as well as changes due to the pandemic, served as an impetus for a re-examination of the formal curriculum of the program. This study seeks to recommend changes to the curriculum to mirror broader shifts in the Associate Fellowship Program overall while also improving instructional quality and effectiveness, allowing Associate Fellows to apply what they learn to advance a more equitable and innovative future in biomedical libraries.

Methods

This study used qualitative methods to develop a deep picture of the experience of the curriculum from the points of view of Associate Fellows and NLM leadership as well as informed expertise from other residency educators. Unit debriefs from three years' worth of Associate Fellow cohorts were inductively coded between the two authors and analyzed for recommendations. Relevant professional competencies were also investigated. Conversations were held between the authors and numerous stakeholders, including NLM leadership, Unit Coordinators, and the Program Coordinator, as well as with coordinators of similar multi-person professional residencies and fellowships in the library sciences.

Results

Two comparable post-graduate library science fellowships were identified, only one of which had any form of curriculum, which was brief and focused solely on institutional activities. Conversations with Unit Coordinators and NLM leadership revealed common interests in refining the structure and individual utility of the curriculum, as well as contradictory views on the relative prominence of NLM institutional knowledge and professional skills acquisition in the curriculum. A total of 44 debriefs were coded, resulting in unique codes revealing Associate Fellows' desire for a blend of institutional and practical training along with interactivity in education. The potential changing future of the format and purpose of the Associate Fellowship Program overall was also identified as a major factor impacting the curriculum.

Conclusions

Numerous recommendations were established based on these findings, aimed at both the Unit Coordinators and the Project Coordinator. These recommendations are designed to bolster and improve the curriculum's quality by balancing greater structure with the flexibility necessary to meet changing needs and trends, both at NLM and within the profession more broadly. These growth opportunities include the need for greater clarity on the aims of the curriculum, alignment between the curriculum and professional trends, better support and guidance for Unit Coordinators, and more interactive and flexible curriculum components.

Introduction

The Associate Fellowship Program of the National Library of Medicine (NLM) has included a 4- to 5-month curriculum element since 1966, when the program was expanded from its initial internship format. Arguably the most significant change to the Associate Fellowship Program came about suddenly, with the onset of the COVID-19 pandemic and mandated remote work in the Spring of 2020. With the 2020-2021 cohort, Associate Fellows were situated remotely across the country, and curriculum was moved to an all-virtual format. In the wake of these changes and new strategic directions at NLM and within Library Operations, the time was right to conduct an evaluation of the Associate Fellowship Program's curriculum unit.

This evaluation, conducted by two of the 2021-2022 Associate Fellows, set out with the goal of providing recommendations on how to adapt the Associate Fellowship Program's curriculum to mirror changes to the fellowship itself and give Associate Fellows the ability to effectively apply what they learn at NLM to advance an equitable and innovative future for biomedical libraries. The Investigation included identification of similar fellowship programs, conversations with NLM leadership and Unit Coordinators, and quantitative analysis of debriefs from the three most recent Associate Fellow cohorts. Professional competencies also played a key role in informing the evaluation, as the authors considered the use of those developed by the Medical Library Association (MLA) as well as the creation of NLM-specific competencies to reflect the added value of this fellowship being situated within the NLM. The recommendations themselves, developed with input from the Program Coordinator and Unit Coordinators, evolved over time during the investigation, and represent a variety of changes that could, in the view of the authors, further improve the Associate Fellowship Program's curriculum portion.

Associate Fellowship Program Curriculum Description

The Associate Fellowship Program begins with a five-month curriculum experience for Associate Fellows. The curriculum is comprised of units, which cover the major divisions of the library. Each unit may last between one and five days. Associate Fellows learn from staff in: Library Operations, Extramural Programs, Lister Hill National Center for Biomedical Communications, National Center for Biotechnology Information, and the Office of the Director (at the time of writing this report, the research areas of both Lister Hill National Center for Biomedical Communications and National Center for Biotechnology Information are forming an Intramural Research Program). The purpose of the curriculum is to teach Associate Fellows about NLM and the global impact NLM has on a variety of fields ranging from informatics to medicine. Within a curriculum unit, NLM staff utilize a variety of teaching tools including lecture, discussion, tours, and workshops.

Methodology

This study employed a mixed-methods approach including comparative analysis with similar fellowship programs, informational interviews with key stakeholders, and quantitative coding and analysis of free-form debriefs.

Examination of Current State of Comparable Fellowships

Upon investigation, the authors found very few comparable cohort-based residencies or fellowships. The authors restricted their search to paid full time fellowships that require an MLIS, so any professional experience offered to students still in school was excluded. Two post-grad library fellowships were identified using search engines and professional organizations' resource pages: Library of Congress Librarians in Residence Program (LOC) and North Carolina State University Libraries Fellows Program (NC State). The coordinators for both the LOC and NC State programs were contacted via email and asked to share whether the programs include a curriculum element comparable to the curriculum offered through the Associate Fellowship Program.

Informational Interviews with Unit Coordinators

Currently, there are 18 Unit Coordinators representing 18 units. They are responsible for organizing presentations from their work areas for the Associate Fellows. The authors met with six Unit Coordinators representing three units: Public Services Division, Organization of Information, and Standards and Terminology. Unit coordinators were asked to describe their unit planning process, the amount of time it takes to plan their units, and what informs the changes they make to their units year to year.

Informational Interviews with NLM Leadership

The authors also met with Associate Director for Library Operations Dianne Babski, Chief of the Office of Engagement and Training Amanda Wilson, and OET Engagement Section Head Blair Anton. Each leader was asked to share their views on what the Associate Fellowship Program would look like in an ideal scenario, how the Program could better support the NLM's strategic initiatives, the future role of the Program at the library, and any criteria for successful completion of the Program in their view.

Additionally, the authors met with Maryam Zaringhalam, the NLM representative on the E committee within the NIH UNITE initiative to get her perspective on how diversity, equity, inclusion, and accessibility (DEIA) could be integrated into the Associate Fellowship Program curriculum. The authors asked her how the Associate Fellow program could support the UNITE initiative.

Analysis of Coded Debriefs

44 debriefs were coded from Associate Fellowship years 2019-2020, 2020-2021, and 2021-2022. The 2019-2020 curriculum was conducted completely in person, while the 2020-2021 and 2021-2022 curricula were delivered virtually. The most recent 12 Associate Fellows contributed to the feedback contained in the debriefs.

A random number generator was used to randomly select one debrief from each of the three years, for both authors to examine and use grounded theory to develop codes from. After the authors separately coded the three sample debriefs, they came together to adjudicate and build a codebook. The codebook consisted of the code name, the definition of the code, and an exemplar coded excerpt from a debrief.

The codes followed the following format: ThematicCode/Subcode. ThematicCode refers to the main conceptual code, and SubCode refers to the clarifiers such as:

- Tone: Positive, Negative
- Level of Detail: Too General, Too Specific
- Session Length: Too Long, Too Short, Appropriate
- Session Timing within Curriculum: Appropriate, Needs Revision
- Engagement: Active, Passive
- Session Pacing: Too Slow, Too Fast, Appropriate

After codes were agreed upon and the codebook was established, the remaining debriefs from the three cohort years were split randomly between the two authors to code independently using the comments feature within Microsoft Word. The authors consulted one another to resolve exceptional cases or code application questions while analyzing the debriefs. After all the debriefs were coded, the authors inputted each other's coded debriefs into a spreadsheet as a means of checking for validity. If an author found a discrepancy or disagreement in coding methodology while transferring codes into the spreadsheet for analysis, they contacted the other author and resolved the discrepancy. Once everything was coded and validated, the Microsoft Excel spreadsheet was used to enumerate coded responses. The coded responses were then sorted by count frequency to identify the most and least frequently occurring codes within the three cohort years. The codebook can be found in Appendix A.

Results

Findings from Comparable Fellowships

The NC State program does not include a curriculum component to their three-year fellowship appointments. The LOC program does have a comparable element which they refer to as a "professional development series (PDS)" which is comprised of lectures of each of the major library divisions. In addition to the PDS they offer a mentorship program like the Associate Fellowship Program does, and optional career development workshops. What separates the LOC PDS from the Associate Fellowship Program curriculum is the length of the sessions. The LOC PDS occur once a week for an hour for a total of thirteen weeks, so the total PDS time commitment for the fellows is thirteen hours. In contrast, a single unit within the Associate Fellowship Program curriculum often lasts over ten hours.

Overall, the Associate Fellowship Program appears to be one of a handful of post-grad library fellowships still in existence. Its commitment to a robust curriculum component of the program makes it unique with no other similar programs currently in operation.

Feedback from Unit Coordinators' Informational Interviews

All the Unit Coordinators agreed that their planning begins with scheduling, and that scheduling consists of the bulk of their time commitment. They attempt to find a week where potential presenters are all available. They noted that there is not always a lot of information provided on what has been done previously when a new Unit Coordinator takes over planning. In general, the Unit Coordinator acts as a liaison for scheduling (this work often occurs months in advance) and not all Unit Coordinators orchestrate content of specific sessions within their unit. The Unit Coordinators reported using Associate Fellow debrief feedback to inform changes year to year but noted that it can be difficult to balance changes and feedback from year to year since each Associate Fellow cohort has different needs and backgrounds. One Unit Coordinator mentioned that they read the bios of the incoming Associate Fellows to help gauge the interests and level of understanding each Associate Fellow will have regarding the topics covered by their unit. All the Unit Coordinators the authors spoke to were receptive to being given more structured framing from the Program Coordinator of what their unit within the curriculum should accomplish, including explicit mention of goals and purpose of the sessions within their unit.

Feedback from NLM Leadership's Informational Interviews

NLM Leadership were asked the following questions:

What the Associate Fellowship Program ideally would look like with no budgetary or time constraints

Associate Fellows would be able to work with researchers and support the research ecosystem. They would use the fellowship year to take on projects outside of their comfort zones and gain professional skills. The Associate Fellows would continue to act as "fresh eyes" for NLM and help infuse new ideas and perspectives into the organization. Overall, the focus would be away from the curriculum, and towards a model of skill acquisition.

How the Associate Fellowship Program could better support the Library-wide strategic plan and the LO long range plan

Associate Fellows could be observers or contributors to teams working on strategic and long-range plans. Their position as fellows allows them to have more objectivity which can help move the process of

making change forward. Associate Fellows being able to complete projects that tie into the implementation of plans could better support the library, too.

The role the Associate Fellowship Program will play within NLM in the next 5 to 10 years

Leadership would like the Associate Fellowship Program to be experimental, innovative and focus on research. They would also like to expand the reach of the fellowship by including more people. This might include shortening the length of the fellowship to allow more fellows to cycle through. The idea of embedding informationists into research labs and partnering with PhDs and PIs to encourage a "symbiotic relationship" was brought up.

Criteria for Success

While criteria for success was not the primary topic of the conversations with leadership, the topic organically arose. One library leader felt that success should be measured based upon the goals of the individual Associate Fellow. In their view, the Associate Fellowship Program is successful if the individual's goals have been met by the end of the fellowship year and they are able to use their experience as a steppingstone to reach their next career goal. Another library leader mentioned that success is not necessarily indicated by an Associate Fellow securing a job within health sciences librarianship. Rather, remaining within librarianship more generally is a measure of success in their view.

DEIA

Maryam Zaringhalam suggested that a standalone unit on DEIA within NLM be added to the curriculum. She also suggested that the Associate Fellowship Program be advertised to HBCUs and Tribal Colleges and Universities.

Outcomes of Coded Debrief Analysis

The majority of the debriefs included mention of the following topics:

NLM Context (38/44)

NLM context is defined as "content within a unit that discusses the context of the unit and/or one of its products within NLM. The context could be historical or modern." The vast majority of the debriefs mentioned NLM context being an asset to the unit. They appreciated explicit mention of the unit's purpose in relation to the larger NLM organization and wrote about the 2021 PSD unit, "They linked their work back to NLM's strategic plan, so it was easy for me to contextualize their work within the larger picture of NLM."

Practice (38/44)

Practice is defined as "The incorporation of real examples (as opposed to hypothetical situations) into instruction." Practice can be contrasted with Theory, "The theoretical underpinnings of a unit's activities", which was mentioned in a positive light in fewer debriefs (10/44). A participant wrote about the 2021 NCBI Literature unit, "This unit also introduced me to some of the practical and administrative elements of NCBI's work; these "real-world" elements are sometimes missing from curriculum units, and their inclusion here is welcomed."

Interactivity (35/44)

Interactivity is defined as "educational content involving Associate Fellows' active participation in some manner, such as trivia games, mock peer review workshops, etc." The majority of the debriefs mentioned the value of interactivity being incorporated into the unit sessions and the connection

between interactivity and a deeper understanding of and engagement with session content. For example, in the 2019 Terminology debrief an Associate Fellow stated, "The hands-on sessions at the end were really useful. I almost would have liked to see/use each tool in action immediately after each session so I could keep them straight!"

Career Applicability (27/44)

Career applicability is the mention of "fellows' ability to apply unit content to their career." In the majority of debriefs, Associate Fellows noted the value of a distinct connection between unit content and skills or knowledge they may take from the unit and use in their careers as information professionals. For example, in the 2020 Extramural Programs debrief, a participant reported, "the conversation about data management plans and data sharing plans illuminated a role that librarians can play in crafting successful grant applications, which I found especially helpful as I work out the role I seek to play in supporting health sciences research in my future career."

Candid Viewpoints (25/44)

Associate Fellows repeatedly mentioned their appreciation of "presenters sharing their own personal viewpoints related to the unit topic." They were actively engaged with unit sessions where presenters opened up and shared personal anecdotes, career trajectory stories, and opinions on happenings within their unit or NLM. An Associate Fellow wrote in the 2020 Digital Collections debrief, "I very much appreciated the short career biographies that the presenters gave to us...Hearing candid viewpoints helps Associate Fellows contextualize the content of the unit and may help them connect the work presenters do for the unit with their own careers.

Future Directions (25/44)

The Future Directions code encapsulates "content within a unit that discusses the future plans of the unit and/or one of its products." Associate Fellows enjoyed discussions surrounding current topics within the unit's wheelhouse that may impact future plans for the unit, as well as any upcoming changes they are planning on implementing. In the 2020 NCBI debrief, an Associate Fellow stated their wish for future directions to be addressed. They said, "It would also be good to have plans for the future included, any talk about what improvements the team would most like to have, or what services/resources would look like in an ideal world."

Preparatory Materials (23/44)

The Preparatory Materials code covers "whether preparatory materials (pre-session readings, training materials, etc.) were of value. Includes mention of flipped classroom teaching method." The majority of debriefs mentioned the use of preparatory materials in a positive light, however specific suggestions were made repeatedly such as giving ample time for Associate Fellows to access the materials prior to the start of the unit and making clear the connection and value of the preparatory materials to the activities and topics covered in the unit. For example, in the 2021 NCBI Biology debrief, an Associate Fellow stated, "thanks for providing us so much prep material before the in-person curriculum. It really helped us get into the mindset, and I especially enjoyed the videos."

Workshop (23/44)

The Workshop code covers "hands-on elements of the unit in the form of a clinic or workshop." This should not be confused with a demonstration which does not allow time for the Associate Fellows to try out the skills or products taught to them the way a workshop does. Workshops lead to higher engagement with the unit material. In the 2019 Collection Development debrief, an Associate Fellow

shared that they "enjoyed having the opportunity to try [their] hand at selecting books for the library. This was a great way to put what [they] learned into practice."

Introductory Session (22/44)

Introductory Sessions "set a common foundation for Associate Fellows" at the beginning of a unit. Overall Associate Fellows noted that the presence of an introductory session is a grounding way for them to orient themselves to the workings of the unit as well as the role of the unit within the larger NLM ecosystem. For example, Associate Fellows wrote in one debrief, "I would have appreciated more conceptual ideas introduced in the very first session of the unit. I think having a general overview first would have helped with my understanding of the deep dives into each product."

Negative Themes

A few negative themes emerged from the code analysis including redundancy (15). Redundancy is defined as "whether the contents of a unit repeat content, either internal to the unit or from another unit." In the fifteen debriefs that included a mention of redundancy, Associate Fellows expressed frustration with the amount of content that overlapped either between sessions within a single unit, or between various units within the curriculum.

Several other negative themes appeared in about one quarter of the debriefs. They were: session length, level of detail, session pacing, and preexisting knowledge. For these codes, often contrasting critiques were present in a single debrief. For example, one Associate Fellow would report that the level of detail presented in the unit was too specific, while another Associate Fellow would report that the level of detail presented in the same unit was too general. This pattern appeared in session length and session pacing, and preexisting knowledge (whether or not it was assumed that Associate Fellows had background knowledge of the unit content) codes, too. The recommendations made in this report address these negative themes by suggesting increased assessment and centralized planning of curriculum units, thus allowing for purposeful and informed adjustments to unit content over time.

Discussion

Several common themes emerged from the results of this study's investigation surrounding the Associate Fellowship Program's curriculum's current strengths and opportunities for growth. The current and potential value of the curriculum for Associate Fellows' professional growth and development was especially prominent, appearing as both a desired outcome by Unit Coordinators and NLM Leadership as well as a positive comment on relevant units' debriefs. The desire for greater structure and guidance was also a common topic of discussion amongst both Unit Coordinators and Associate Fellows, who reported some confusion as to the intended purpose of the Program's curriculum. Along with pedagogical suggestions, the outcomes of the Associate Fellows' coded debriefs further reflect a desire for professional development, interactivity, and greater personal connection with their presenters.

Conversations with the Program Coordinator, NLM Leadership, and Unit Coordinators also revealed a contradiction in how key stakeholders of the Associate Fellowship Program view the curriculum's intent. Some of these stakeholders asserted that the key focus of the curriculum should be to teach the Associate Fellows about the NLM as an institution, with any professional skills acquisition as a desired but not required element. Others saw professional development and professional skills acquisition as a necessary part of the curriculum, given the Program's goal of preparing Associate Fellows for a career in health sciences librarianship. Notably, Associate Fellows' debriefs equally weighted the acquisition of institutional knowledge and professional skills, suggesting that Associate Fellows themselves desire a balance of the two.

In light of these themes, the authors sought out professional competencies that might help provide greater structure and professional skills descriptions for the Program Coordinator, Unit Coordinators, and Associate Fellows. Professional competencies provide a standard way of describing the skills and abilities necessary for success in a given field. Creating and reviewing such competency lists provides structure to professional development curriculum.

The Medical Library Association (MLA), a professional body of health sciences librarians with which NLM has a long-standing relationship, released their most recently revised set of professional competencies in 2017. They are included for reference in Appendix B of this report. These competencies are standardized and generalizable to all forms of health science librarianship, and thus provide a framework for understanding the needs and expectations of the profession. In addition to their competency list, the MLA has released a free competencies self-assessment tool which helps individuals gauge their skills in each area. The link to that tool is also included in Appendix B.

While the MLA Professional Competencies are valuable when considering professional development in the field generally, gaining NLM-specific knowledge is a key component of the Associate Fellowship Program. Relying on coded feedback from the unit debriefs and conversations with the Program and Unit Coordinators, the authors thus established a list of NLM-specific competencies, centered on 5 main themes. These competencies provide a greater framework of the curriculum to meet this mission objective and standardize the ways in which NLM-specific knowledge is conceived for greater clarity. The NLM competencies are designed to work in cohesion with the MLA competencies to guide the Associate Fellowship Program's curriculum. They can be found in Appendix C. These competencies, while not as granular as those developed by the MLA, cover a wide range of necessary knowledge areas expected of Associate Fellows.

Recommendations

This project was conceived with the goal of recommending changes to the curriculum to mirror broader shifts in the Associate Fellowship Program overall while also improving instructional quality and effectiveness, allowing Associate Fellows to apply what they learn to advance a more equitable and innovative future in biomedical libraries. As a result, two specific sets of recommendations have been developed: those targeted at the Unit Coordinators, and those aimed at the Program Coordinator. The recommendations intended for the Unit Coordinators are broken up into two categories: those focused on changes to the format of their units, and those focused on the pedagogical approaches that could be incorporated into units' sessions. The Unit Coordinator recommendations can be found in Appendix D, and the Program Coordinator recommendations can be found in Appendix E. Based on the findings from this investigation, our recommendations are designed for long-term success independent of future changes in the Associate Fellowship Program.

The recommendations proposed here have been developed alongside conversations and review with the Program Coordinator and Unit Coordinators. They are also tied heavily to both the MLA Professional Competencies included in Appendix B, and the NLM-Specific Competencies the authors created, in Appendix C. The NLM-Specific Competencies are designed to work in tandem with the MLA Professional Competencies, and the MLA Competencies alone are insufficient to guide the development of the Associate Fellowship Program curriculum, given its broad focus. As a result, the two sets of competencies should be deployed together, to provide a robust scaffold upon which to improve and refine the Program's curriculum.

The recommendations for both Unit Coordinators and the Program Coordinator are informed by the authors' belief that the Associate Fellowship Program's curriculum should equally pursue both the acquisition of institutional knowledge and professional skills for Associate Fellows. The findings of this study, especially regarding the results from the coded unit debriefs, suggests that Associate Fellows anticipate and highly value professional skills acquisition. Embracing professional skills development as a program aim thus increases the value derived by Associate Fellows' participation in the curriculum. This is especially important given the current expectation that Associate Fellows will find employment outside of the NLM after their program year; incorporating skills training into the curriculum better prepares Associate Fellows for the next stages in their careers. Furthermore, incorporating skills development alongside the acquisition of institutional knowledge better mirrors, and prepares Associate Fellows for, the successful completion of their hands-on project work throughout the program.

Future Considerations

The authors believe this report and the recommendations within it are a jumping off point for future change and implementation. The recommendations in this report are simply recommendations, not a timeline or map for implementation. This means that the recommendations within this report can be implemented in a myriad of ways. Because of the limited scope of this project, the authors foresee several future changes for the Program Coordinator, Unit Coordinators, and NLM leadership to address after considering the proposed recommendations.

There are many future considerations that the authors recommend exploring that fall under implementation. The first future consideration would be for the Program Coordinator to create more robust questions for unit debriefs to improve Associate Fellow feedback quality. This would occur after

the Program Coordinator defines the role of the debrief as recommended by the authors. To further extend this consideration, the creation of a structured debrief survey could be a project for a future Associate Fellow who is interested in assessment to take on.

The Program Coordinator may also wish to establish the amount of time allotted for Associate Fellows to review preparatory materials, and/or to standardize the length of units and sessions. The amount of preparatory work will likely directly correlate with whether the Program Coordinator chooses to shorten or lengthen the amount of time each Unit Coordinator schedules with the Associate Fellows each year.

Once the role of the Unit Coordinator is better defined, the Program Coordinator may wish to explore creating a list of requirements for Unit Coordinators that clearly communicates their role. This will help to maintain consistency within a unit when the role of Unit Coordinator is passed on to a colleague, and between units being led by different Unit Coordinators. If the Unit Coordinator role explicitly includes coordination between session speakers and other Unit Coordinators, redundancies between and within units could also be reduced.

After adopting the MLA and NLM competencies into the curriculum, the Program Coordinator may wish to consider the dispersal of said competencies across units. They may consider assigning specific competencies to individual units, asking Unit Coordinators to cover as many competencies as possible, or allow the Unit Coordinators to self-select a select number of competencies they would like to cover within their unit. Regardless of the specific implementation choice the Program Coordinator makes, they may wish to take a comprehensive look at which MLA and NLM competencies are being covered within the curriculum, and where there may be gaps in coverage. This could lead to potential future changes in the Associate Fellowship Program curriculum as a result of this examination. Additionally, the Program Coordinator may consider adding new content in the form of a unit on DEIA within NLM in response to the suggestions from library leadership and NLM strategic initiatives.

As part of the revision process of the Unit Coordinator recommendations, the authors solicited feedback from all current Unit Coordinators. Most of the feedback received came in the form of questions or comment specific to how the recommendations might be implemented for each individual unit. Due to the scope of this project, the authors were not able to advise on specific implementation strategies for Unit Coordinators. However, this revision feedback demonstrated a potential future consideration for the Program Coordinator to contemplate. They may wish to explore creating "tips and tricks for session presenters" or a similar document which explicitly lists examples of how the Unit Coordinator recommendations would ideally look at the session presenter level.

Limitations

A number of potential factors limit the findings of this project. Only the last three years' cohorts' unit debriefs were coded and analyzed during this investigation. All of those cohorts were impacted in some measure by the switch to remote work necessitated by COVID-19. As a result, these debriefs may reflect some of the benefits and challenges introduced by a rapid shift in curriculum content delivery. Additionally, both authors are members of the 2021-2022 cohort, whose debriefs were coded for analysis. Even though the unit debriefs themselves were anonymized, the authors' coding of their own debriefs could have introduced analysis bias. Furthermore, the authors collected data from past Associate Fellows via their unit debriefs, instead of primary interviews. This precluded the authors for identifying any long-term impacts of the curriculum.

Two major limitations are linked to the drafting of the proposed recommendations. First, the authors worked with the presumption that the Associate Fellowship Program would continue to operate, and would not change significantly, when drafting their recommendations. Changes in the length of the program, its eligibility requirements, or its core objectives might have impacted the ultimate curriculum proposals made here. Additionally, this report and its recommendations were drafted in concert with the Program Coordinator, which may have similarly impacted its findings.

Conclusion

This analysis demonstrates that by and large the Associate Fellowship Program curriculum is appreciated by Associate Fellows as a high value-add element of their time in the program, and that some additional changes could be made to further increase the positive impact and effectiveness of curricular instruction on the Associate Fellows. The recommendations outline potential changes that would be of a high positive impact for the Associate Fellows while providing better communication of expectations for Unit Coordinators and the Program Coordinator. The recommendations, in line with conversations with NLM leadership and coded debriefs, are also intended to be flexible, allowing for both long-term changes in the Associate Fellowship Program's structure and for Associate Fellows' individual professional interests.

These recommendations were developed in conversation with Unit Coordinators as well as the Program Coordinator and are proposed here with the understanding that (if adopted by the Program Coordinator) they will take time to implement. Some units and unit sessions may change dramatically over time, while others may only make slight adjustments. It is also anticipated that any changes, like these recommendations, will occur as part of broader conversations between Unit Coordinators, the Program Coordinator, and all other relevant stakeholders at NLM.

During the authors' investigation, a common theme that emerged from conversations with NLM leadership, the Unit Coordinators, and the Program Coordinator was the desire for the Associate Fellowship Program generally, and the curriculum portion specifically, to help improve Associate Fellows professional skills while exposing them to the NLM and the wide variety of roles available within health sciences librarianship. This became the primary focus of the authors in setting both these recommendations and the NLM-Specific Competencies that underpin them. As changes are made to the Associate Fellowship Program in response to shifting NLM work arrangements and new institutional strategic directions, this shared mission can be relied upon to help ground the program and steer developments to the curriculum.

As the premier post-graduate training program for health sciences librarians, the Associate Fellowship Program and its curriculum play an important role in shaping the workforce and its leading members. These recommendations acknowledge the importance of direct training in shaping the Associate Fellowship Program and, as a knock-on effect, the reputation of the program and its fellows. As the field of health sciences librarianship changes to incorporate new professional skills (such as NIH's recent embrace of data science and health science librarians' resultant additional responsibilities in this field) and address new health challenges, the Associate Fellowship Program must be poised to prepare Associate Fellows for a successful career in that field. These recommendations are thus made in the spirit of continuous improvement, as well as with an eye towards the potential for future significant changes to the Associate Fellowship Program similar to those that occurred when the Associate Fellowship Program was created out of a smaller internship program in the mid-1960s. The authors hope these recommendations will strengthen the Associate Fellowship Program by aligning it with established and emerging trends and skill needs in the field of health sciences librarianship, improving outcomes and instructional value for Associate Fellows while guiding manageable change for Unit and Program Coordinators.

Acknowledgements

Appendix A: Code Book

Thematic Code	SubCode	Definition	Example
External Content	Positive, Negative	Educational content delivered by individuals or groups outside of the NLM/NNLM. This can include other government agencies, professional bodies, or industry collaborators.	"Lastly, I really enjoyed hearing Jeff Smith from AMIA, Heather Joseph from SPARC, and Mary and Maggie from MLA share their viewpoints as organizations that can lobby for health IT and open science."
Diversity of Content Delivery	Positive, Negative	Educational content delivered in multiple formats or modalities, such as the combination of lectures, videos, interactive work, etc. The benefit here can be expressed either as a means of breaking up different modes in instruction into smaller/more manageable elements, or the value of the multitude of formats for increasing pedagogical impact.	"It was nice to have videos to break up the presentations as well."
Theory	Positive, Negative	The theoretical underpinnings of a unit's activities. Positive means that theory was helpful or would have been, negative means the focus was too much on theory	"I was also hoping Jeff would talk more about what the actual collaboration looks like (such as the process and discussions between AMIA and NLM) than just explaining the key issues we collaborate on in regards to informatics."
Practice	Positive, Negative	The incorporation of real examples (as opposed to hypothetical situations) into instruction. Positive means that practice was helpful or would have been, negative means	

Thematic Code	SubCode	Definition	Example
		the focus was too much on practice	
Social Element	Positive, Negative	The organic or inorganic creation of space for personal connections to be built between the Associate Fellows and the presenters	"The potluck was also a nice social touch to a long day of learning"
Interactivity	Positive, Negative	Educational content involving Associate Fellows' active participation in some manner, such as trivia games, mock peer review workshops, etc.	"I also think it would have been good to have more interactive features (discussion questions, scenarios, etc.) in future sessions to help with engagement. "
Lecture	Positive, Negative	Mention of lecture-based elements of presentations	"I was hoping the brown bag with Heather would be more of a discussion than a presentation…"
Discussion	Positive, Negative	Interactive discussion between Associate Fellows and presenters	"I was hoping the brown bag with Heather would be more of a discussion than a presentation because I had so many questions about the work SPARC does"
Visual Elements	Positive, Negative	Mentions Visual elements in the unit presentations	". I liked the photographs; the images were great for visualizing the research. "
Video	Positive, Negative	Mention of Videos as an instructional tool	"It was nice to have videos to break up the presentations as well"
Introductory Session	Positive, Negative	Whether a unit includes an introductory session to set a common foundation for Associate Fellows. Positive indicates that such a session was commented upon favorably, negative indicates that such a session was either noted as missing or insufficient by Associate Fellows	"Valerie Florence's and David Landsman's overview of intramural research at NLM provided useful context for the rest of the sessions"
Workshop	Positive, Negative	Mentions hands-on elements of unit in the	

Thematic Code	SubCode	Definition	Example
		form of a clinic or workshop	
Questions	Positive, Negative	Whether questions are encouraged, and time allotted for them in a unit	"I really enjoyed that the speakers were receptive to our questions and willing to go above and beyond to make sure we understood the material presented in front of us"
Level of Detail	A) Too specific, B) Too general, C) Appropriate	Whether the detail provided in the unit was (A) too specific, (B) too general, or (C) appropriate. This should be specified during coding	"I appreciated the level of detail provided and the context for why PMC and the PMC team work as they do. "
Redundancy	Positive, Negative	Whether the contents of a unit repeat content, either internal to the unit or from another unit.	"It was good to have some refreshers on PubMed"
Breaks	Positive, Negative	The building in of breaks within a unit. Positive means that breaks were or would have been appreciated, negative means they were too much	"It may have been helpful to have a lunch break at least one of the days."
NLM Context	Positive, Negative	Content within a unit that discusses the context of the unit and/or one of its products within NLM. Could be Historical or Modern context	"I could make the connections between the library's mission and the more informatics-focused topics, but I was a little confused about why some of the more biomedical research projects fell under the NLM umbrella rather than another institute within NIH."
Timing within Curriculum	Appropriate, Needs Revision	When a unit occurs in the context of the year's curriculum. Should be specified as Appropriate or needs Revision. Needs revision may have other subcodes	"I do believe that this unit should be scheduled earlier in the year" (Needs revision/Earlier)

Thematic Code	SubCode	Definition	Example
Future Directions	Positive, Negative	Content within a unit that discusses the future plans of the unit and/or one of its products. This can also include the unit's involvement in meeting the goals of the Strategic Plan	"It would also be good to have plans for the future included, any talk about what improvements the team would most like to have, or what services/resources would look like in an ideal world. "
Preexisting Knowledge	Positive, Negative	Whether Associate Fellows are presumed to have existing knowledge in a particular subject area before the unit. Positive indicates no anticipation of previous knowledge	"I liked them because I did not need a strong scientific background to understand them."
Session Length	(A) too long, (B) too short, (C) appropriate.	Whether individual sessions within a unit are (A) too long, (B) too short, or (C) appropriate. This should be indicated in the codes	"I think that to make up for the lack of scaffolding, it may be helpful to have a shorter presentation. I think having shorter 15 minute or less presentations may help with not needing much of a science background." (Too long)
Candid Viewpoints	Positive, Negative	Mention of presenters sharing their own personal viewpoints related to unit topic.	"I really enjoyed hearing Jeff Smith from AMIA, Heather Joseph from SPARC, and Mary and Maggie from MLA share their viewpoints "
Fellows' Engagement	Active, Passive	Mention of level of engagement between the unit and the fellows	"I also think it would have been good to have more interactive features (discussion questions, scenarios, etc.) in future sessions to help with engagement."
Career Applicability	Positive, Negative	Mentions fellow's ability to apply unit content to their career. Mention of skill acquisition is included.	"I can see myself using this information in order to help researchers in the future, as well as to organize my own research for a project I'm currently working on"

Thematic Code	SubCode	Definition	Example
DEIA	Positive, Negative	Unit discusses diversity, equity, inclusivity, and/or accessibility	
Session Pacing	Too Slow, Too Fast, Appropriate	Mentions the pace at which content was presented within a session either being too slow, too fast, or appropriate	"one presentation later on Tuesday morning (Licencing e-Resources) went a bit long at the end so some of the content was a bit rushed"
Session Order	Appropriate, Needs Revision	Whether the order of sessions within the unit is appropriate, or requires revision	" I think the order of the days presentations helped illuminate the steps in this process. "
Preparatory Materials	Positive, Negative	Whether preparatory materials (pre-session readings, training materials, etc.) were of value. Includes mention of flipped classroom teaching method. Positive indicates where preparatory materials are valuable or would have been valuable, negative indicates that they were not necessary, helpful, or valuable.	"thanks for providing us so much prep material before the in-person curriculum. It really helped to get us into the mindset, and I especially enjoyed the videos. "

Appendix B: MLA Competencies (2017)

Competency 1: Information Services - A health information professional locates, evaluates, synthesizes, and delivers authoritative information in response to biomedical and health inquiries.

At the core of what we do is find information to answer biomedical and health-related questions at the point of need. We are experts in assessing information needs and delivering information in a format and means of delivery best suited to the individuals and groups making requests.

Indicator	Basic	Expert
Assesses information needs.	Uses reference interview skills.	Uses the language of biomedical science.
Selects information.	Locates published information and assesses its authority, accuracy, objectivity, currency, and relevance.	Uses unpublished resources and consults with subject experts.
Searches databases and other online resources.	Describes steps in conducting a search; identifies relevant resources; formulates search strategies using appropriate search construction techniques, subject descriptors, and natural language and Boolean connectors.	Formulates and executes complex search strategies in a variety of information resources; customizes search outputs.
Finds published and unpublished studies for complex reviews.	Describes systematic review standards and guidelines; searches relevant subject-specific databases and other sources.	Filters results using predefined eligibility criteria; organizes and distributes results; documents search strategies and procedures for publication.
Customizes the organization and delivery of information.	Prioritizes information for ease of use; selects appropriate delivery method and technology.	Synthesizes results; explains strengths and limitations of sources.
Stays current with developments in bioscience, clinical, and health information.	Describes basic terms and trends.	Specializes in one or more areas of bioscience, clinical, or health information.

Competency 2: Information Management - A health information professional curates and makes accessible bioscience, clinical, and health information data, information, and knowledge.

Our strength is our ability to develop and organize collections tailored to specific audiences. In cataloging and classifying, including assigning metadata, we impose order to improve access. Traditionally, we have organized information resources into libraries, and personal records and artifacts into archives. Now, our expertise is being applied to organizing research data into collections that can be used electronically across institutions and countries. We know the value of and how to apply standards so that records of collections are universally comprehensible and enduring.

Indicator	Basic	Expert
Selects, acquires, manages, evaluates, and disseminates bioscience, clinical, and health information.	Describes collection management tools.	Uses current evaluation methodologies, including bibliometrics, to develop and implement collection management policies and strategies.
Organizes resources.	Organizes resources according to national and international standards.	Develops classification and metadata schemes for unique collections.
Adheres to copyright and intellectual property law.	Describes copyright and intellectual property law relevant to libraries.	Applies knowledge to open access publishing and virtual learning environments; contributes to copyright and intellectual property law discussions on behalf of institutions or associations.
Conserves, preserves, and archives print and digital materials to maintain historical and scholarly records.	Adheres to standards in archiving, digital preservation, and records management.	Formulates institutional strategies for archiving, digital preservation, and records management; promotes the significance of institutional asset management.
Provides access to resources using appropriate technologies.	Describes access, including open access, management systems, and services.	Negotiates terms and conditions of licensing contracts; monitors trends in open access publishing; promotes institutional repositories.
Promotes scholarly communication.	Describes open access and publishing models, institutional repositories, authors' rights, and public access policies.	Analyzes scholarly communication trends; collaborates on initiatives to promote and advance scholarly communication.
Implements data management plans.	Describes the data life cycle; identifies and describes data resources, tools, and repositories; explains data plan requirements of funding agencies.	Conducts data curation interviews; develops and implements data management plans and policies; consults on managing data across the data life cycle.

Competency 3: Instruction & Instructional Design - A health information professional educates others in the skills of bioscience, clinical, and health information literacy.

Librarians are educators. We help others, but we also enable people to be self-sufficient. What we teach continues to evolve, from how to use resources, to how to critically appraise research articles, to how to organize data collections. As the world becomes more and more an information space, there will be additional opportunities to teach information management skills. We also share our expertise with one another. Our teaching role requires that we be skilled in pedagogy and the use of technology-enhanced learning.

Indicator	Basic	Expert
Develops curricula using contemporary instructional design principles.	Describes principles of instructional design.	Develops face-to-face and online learning activities based on instructional design principles.
Uses learner-centered instructional approaches.	Describes learner-centered instructional approaches.	Uses learner-centered face-to-face and online learning approaches.
Uses innovative instructional and communication methods and technologies.	Describes trends in communication and instructional methods and technologies; uses social media and web-based technologies.	Evaluates, develops, and implements innovative instructional and communication strategies and technologies.

Competency 4: Leadership & Management - A health information professional manages personnel, time, budget, facilities, and technology and leads others to define and meet institutional goals.

Every health information professional has personal management responsibilities. Institutional management and leadership roles require skills beyond those learned through formal education. Management skills and a leader's abilities affect the culture and performance of coworkers and the effectiveness of an institution.

Indicator	Basic	Expert
Strategically organizes people and resources to serve institutional needs.	Identifies goals; initiates, plans, and delegates tasks to meet goals; analyzes and communicates outcomes to relevant stakeholders; fosters a positive team environment; serves as team member role model.	Establishes, justifies, and leads large-scale collaborative projects that demonstrate return on investment to stakeholders; provides and models value-based leadership through staff and resource administration.
Creates and implements strategic plans.	Describes the strategic planning process.	Creates and implements strategic plans.
Inspires and leads others to perform at their highest level.	Uses communication and collaboration skills.	Articulates a vision, motivates and leads others to contribute to realization of the vision, and guides institutional change.
Integrates multicultural awareness and appreciation of diversity and equality into professional practice.	Describes own cultural background and recognizes biases; values cultural norms, experiences of others, and expressions of diverse viewpoints; recognizes power dynamics in relationships.	Develops and implements practices that foster diversity and equality; contributes to correcting inequities; participates in external collaborations.
Practices fiscal accountability and stewardship, and follows institutional resource policies.	Describes established policies that safeguard assets consistent with institutional objectives and sound business principles.	Controls and supervises library resources consistent with institutional objectives and sound business principles; advocates for and secures institutional support to ensure maintenance and growth of the library.
Secures and manages external funding.	Describes grant and other external funding processes; identifies funding opportunities.	Applies grant-writing principles and strategies; identifies partners and collaborates to develop proposals; executes fundraising strategies; disseminates information about successful strategies and outcomes.
Develops and implements enhancements to the library user experience.	Describes the literature on library user experience and user experience assessment.	Uses results of formal and informal user experience assessments to propose and implement library user experience enhancements.
Identifies emerging technologies and advocates for their use.	Explores and evaluates emerging technologies.	Leads initiatives to incorporate new technologies.
Allocates space and facilities.	Describes common library functions and associated space; identifies standards for space and facilities allocation.	Proposes or leads design of library facilities.
Develops and implements effective advocacy, marketing, and communication strategies.	Promotes institutional mission and goals; forms internal partnerships.	Designs marketing and public relations strategies and programs; forms external partnerships.

Competency 5: Evidence-Based Practice & Research - A health information professional evaluates research studies, uses research to improve practice, conducts research, and communicates research results.

For many years, we have promoted and taught the skills of evidence-based medicine. Now, we need to apply these skills to our own practice. Not all of us are researchers in the academic sense, but we all have access to a wealth of data from local and published sources. Newer research methodologies—such as community-based action research, outcomes research, and data mining—may be useful in analyzing our activities and impact. As we develop research skills, we can use, create, and share evidence to improve practice.

Indicator	Basic	Expert
Finds and evaluates evidence to support decision making.	Describes evidence-based practice; formulates questions; develops search strategies; locates relevant, credible, and transferable published evidence.	Uses evidence to make and justify decisions.
Evaluates activities, programs, collections, and services using evidence-based methodologies.	Gathers data and user input on activities and services.	Identifies and develops evaluation methods and metrics for assessing and improving services.
Conducts research.	Describes the research process, structure of research papers, and common research methods, including bibliometrics; explains standards of ethical research.	Selects and implements appropriate research design; collects, manages, and analyzes data; interprets results; explains threats to validity of conclusions.
Interprets data and presents statistical and data analyses.	Describes basic statistical and data analysis concepts and terminology; interprets visual displays of data and bibliometric analyses.	Explains rationale for choice of statistical and data analyses; critiques and explains statistical and data analyses in published research; uses advanced data visualization tools.
Communicates research results.	Describes how research is disseminated; describes issues related to research dissemination.	Communicates research results; writes, edits, and revises manuscripts for publication.

Competency 6: Health Information Professionalism - A health information professional promotes the development of the health information professions and collaborates with other professionals to improve health care and access to health care information.

As members of a profession, we are motivated to contribute to society in ways that highlight our special knowledge and expertise.

Indicator	Basic	Expert
Collaborates with other health sciences professionals and promotes the contributions of health information professionals.	Describes the role of health information professionals in the biosciences, clinical practice, and health care.	Collaborates with fellow health information professionals to achieve common goals; advocates the value of health information professionals in improving health care and institutional return on investment.
Provides information and expert advice on current issues in health care information services.	Identifies current trends and their impact on information services and practices.	Employs expertise to influence programs, services, and policies; collaborates at the national or international level.
Applies knowledge of the health care environment to respond to health care trends.	Describes the health care environment and current trends in health care.	Assists institutions in meeting accreditation and legal

Indicator	Basic	Expert
		requirements; responds to trends by redirecting resources.
Advocates for health information access.	Promotes access to health information; participates in community outreach activities.	Employs expertise to influence health information programs, services, policies, and legislation.
Contributes to the profession and shares expertise through publications, teaching, research, and service.	Participates in professional organizations by serving on committees, publishing, or presenting; obtains Academy of Health Information (AHIP) membership.	Serves in a leadership role in a professional organization or publication; serves as representative to a national or international organization.
Participates in and fosters a culture of lifelong learning.	Identifies gaps in knowledge and skills; seeks professional development opportunities and mentors to address gaps.	Builds professional skills in advance of emerging trends; mentors others.

Appendix C: NLM-Specific Competencies

1. **NLM Organizational Structure:** An NLM Associate Fellow understands the library's overall structure, the composition of its divisions, and the role of the NLM as a national library.
    a. Knowledge of NLM's operational structures supports awareness of NLM's capabilities and responsibilities and makes Associate Fellows aware of the various job possibilities available within the field of library and information science.
2. **NLM Products and Services:** An NLM Associate Fellows comprehends the breadth and depth of the library's products and services, including collections, terminologies/standards, databases, research, and engagement and training work.
    a. First-hand knowledge of NLM's products and services, including their origins, design decisions, maintenance requirements, uses, applications, controversies, failures, and potential future states all enrich Associate Fellows' familiarity with the slate of resources they will use and rely upon as future health science librarians.
3. **NLM Strategic Initiatives:** An NLM Associate Fellow recognizes the strategic directions of both the library overall and Library Operations specifically and plays a part in supporting the implementation of those directions.
    a. Strategic planning and implementation are vital roles of future leaders and innovators in health sciences librarianship. Associate Fellows' awareness of and involvement in these processes for both Library Operations specifically, and NLM as a whole, provide opportunities for honing relevant professional skills.
4. **Health Sciences Library Policy and Legislative Affairs:** An NLM Associate Fellows can identify the role the library plays in advising and responding to health sciences and health information policy and legislative efforts.
    a. Associate Fellows can gain exposure to current and future policy issues and trends through their connection to NLM's policy development activities, helping to inform their future activities as health sciences librarians.
5. **Health Sciences Librarianship as a Profession:** An NLM Associate Fellow is cognizant of pertinent elements of health sciences librarianship that prepare them for success as a new entrant into the field.
    a. Associate Fellows' connection to the foremost health sciences library in the country (and the concomitant connection to NLM leadership and mentors) affords them an unmatched means of learning what it means to be a health sciences library professional, the emerging issues and trends in the profession, job prospects as well as salary and location expectations for these roles, and the potential for federal service in the field.

These competencies, while not as granular as those developed by the MLA, cover a wide range of necessary knowledge areas expected of Associate Fellows.

Appendix D: Recommendations for Unit Coordinators

Format-Based Recommendations

Incorporate both introductory sessions and wrap-up sessions to help improve Associate Fellows' understanding. Introductory sessions should provide a foundation for the entirety of the unit, including an overview of the important concepts or themes you will address, as well as introducing the staff. Such sessions are most effective when they discuss both the history and future directions of your operational unit. Wrap-up sessions at the end, in the form of either a structured or unstructured Q&A or a guided discussion around a set of "big picture" topics, help synthesize the information from different presenters and resolve any remaining ambiguities for Associate Fellows. You could also ask the Associate Fellows in advance to lead the wrap-up session themselves, as a form of active participation in the unit.

Provide both core and supplementary preparatory materials for Associate Fellows to learn from prior to your unit. Materials such as text documents, videos, and interactive training modules can be a good place for general overview content. Core materials should be directly related to the unit's sessions, and might include items like glossaries of relevant terms, organizational charts, example case studies, and other foundational information that will help prepare the fellows to understand what you will present. Supplementary materials that are relevant for future/further learning but are not directly related to the content of the sessions are helpful for those interested in pursuing a deeper understanding of the topics of the unit.

Incorporate interactivity and a diversity of delivery formats to actively engage Associate Fellows. The Associate Fellows want to actively engage with NLM staff members and your unit's content, so provide them with opportunities to interact with you, discuss concepts, and apply what they are learning. Ways to interact can take many forms, such as workshops (interactive hands-on content), structured discussions, visual elements, and flipped classroom activities. The Program Coordinator may provide examples of interactive delivery formats upon request.

Approach-Based Recommendations

Strike a balance between a general overview and a deep dive into your field. Aim your unit at an audience that is interested in your work but may never do your job or even work at NLM. Consult the MLA Professional Competencies [hyperlink] included in this document for guidance.

Reduce intra- and inter- unit redundancies to prevent overlaps in content coverage. Within your own unit, liaise with session presenters to ensure clear expectations of who presents what topics. Presenters should also be aware of concepts defined in any introductory sessions to prevent overlap. However, intentional intra-unit content repetition can be a useful instructional tool in moderation. You should also communicate with other units' coordinators to ensure that topics are not being repeated across the curriculum. The Program Coordinator will help facilitate communication regarding inter-unit overlaps.

Tie your sessions' content into the wider NLM context and significance in the field. Associate Fellows come to NLM to learn about the unique activities of the NLM. Address how your unit fits within NLM's organizational mission, the NLM Strategic Plan, or any applicable Long-Range Plans. Explain what is unique about your job, products, and/or services within the context of a national, federal library in the health sciences or as part of the National Institutes of Health. Consult the NLM-Specific Competencies outlined in this document for guidance.

Share personal experiences and perspectives about your work to supplement standard curriculum content. Associate Fellows are in the early stages of their careers, and so want to know why and how you are at NLM doing what you do. Information about your career paths, unique backgrounds, and personal experiences can provide an understanding and pathway for early career professionals. Candid viewpoints help increase Associate Fellows' understanding of you and of NLM while increasing their understanding of different career paths.

Appendix E: Recommendations for Program Coordinator

Adopt both the MLA and NLM Competencies into the curriculum as a means of ensuring adequate coverage of all the professional knowledge areas necessary for success as a health sciences library leader and innovator. The NLM competencies are designed to work in cohesion with the MLA competencies to guide the Associate Fellowship Program's curriculum.

Better define the role of the Unit Coordinator to improve administrative consistency across units and ensure appropriate staffing. Unit coordinator tasks may include describing the topics to be covered, identifying the learning objectives for the Associate Fellows, and using feedback to make changes over time. Unit coordinators should centralize the planning of a unit's content, with a cohesive and curated approach. Unit coordinators should be encouraged to include a selection of representatives for the unit, instead of comprehensive staff participation and project coverage.

Facilitate the reduction of content overlap between units to reduce redundancies. The Program Coordinator should identify known and potential areas of redundancy and facilitate their resolution with the impacted units.

Incorporate assessments of Associate Fellows' knowledge into the curriculum in the form of pre- and post- curriculum competency self-assessments. The MLA Professional Competencies Self-Assessment is ready-made for this task, and a similar tool could be created for NLM-Specific Competencies. Completion of self-assessments during on-boarding might help Associate Fellows identify specific competencies they wish to cultivate during their year, and re-completion during off-boarding might help the Program Coordinator identify competency areas not adequately met by the curriculum. Informal check-ins with Associate Fellows, potentially overlapping with Individual Development Plan check-ins, can help identify and clarify remaining ambiguities.

Make explicit the role of the debrief. Determine whether the purpose of the debrief is to facilitate formative assessment of Associate Fellows' learning, to spark Associate Fellows' self-reflection, and/or to provide feedback for Unit Coordinators.

Actively assess curriculum units' content and guide Unit Coordinators to ensure that sessions are aimed appropriately at the Associate Fellows and further the goals and aims of the Associate Fellowship Program. Each individual session within a unit should be clearly connected to the overall aims of the unit, as defined by the MLA and NLM competencies that the Unit Coordinators and/or Program Coordinator decided to focus on.

Create guidance for introducing new content to, or removing obsolete content from, the curriculum. New and obsolete content may be identified via strategic and long-range planning efforts, emerging professional trends, debrief feedback, and Unit Coordinators' input. These topics may be integrated into existing units' sessions or turned into standalone units. For example, informational interviews and debrief analysis recommends greater coverage of DEIA topics and initiatives at NLM.

Introduce optional and flexible elements into the curriculum to allow Associate Fellows to focus their studies based on their pre-assessed professional strengths and areas for growth. While this might take many forms, the ability for Associate Fellows to select areas for further education is a key part of their professional agency.

Change recording of sessions from an opt-out option to an opt-in option. Recording sessions may make session presenters feel that they cannot be completely candid with Associate Fellows and may make Associate Fellows feel that they cannot ask certain questions. Since recording sessions was not standard practice before the COVID-necessitated shift to virtual instruction, and since most sessions have now been recorded at least once previously, future sessions could be made opt-in recorded.

Enact greater structure and opportunities for interactions with leadership, to better meet the program's goals of preparing future library leaders. This might take the form of more structured and formalized shadowing of NLM leadership and/or setting additional times to meet with NLM leadership throughout the year in less formal settings (such as brown bag lunches).