

Inquiry learning: educating librarians for their educational role

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Abstract

Inquiry learning is a concept familiar to Brazilian librarians, who have been expressing concern about their contribution in innovating the learning process. It is therefore necessary that future librarians experience this learning strategy during their education. This study aimed to investigate: 1) how library students exposed repeatedly to strategies of inquiry learning react; 2) the difficulties they encounter in the process; 3) and what types of learning they acquire. Data were collected through in depth interviews with undergraduate library students taking an Information Literacy Course. Data analysis was based on Kuhlthau's ISP model (2004) and in the five types of learning (Kuhlthau; Maniotes & Caspari, 2012) Results, that cannot be generalized, show that students reacted positively to the strategy, although they reported several difficulties. In conclusion the repetition of the inquiry learning process became important for students to feel more secure and confident and for their difficulties to be minimized. On the whole the acquisition of the five types of learning was observed.

Keywords: Inquiry learning, Librarian's education, Brazil

Introduction

The concept of inquiry learning originates from the movement of educational renewal that advocates the use of active learning methods and considers the student responsible for the construction of his/her knowledge (Detlor, B. et al., 2012; McKinney, 2013). It is based on ideas of educators and researchers such as John Dewey, George Kelly, Jerome Bruner,

David Ausubel, Jean Piaget, Lev Vygotsky and Howard Gardner (Kuhlthau, Maniotes & Caspari, 2007).

In Brazil, inquiry learning roots are found in the movement called New School or Active School, that occurred in the 1930s and whose guiding belief is the student as a free, active and socially motivated person, demonstrating curiosity to learn. The focus of instruction is in the learning process, so students are at the center of the pedagogical action (Vidal & Faria Filho, 2003).

The concept of inquiry learning is familiar to librarians, since the library is allegedly the place to search for information, an activity that supports – or should support – such a process (Campello, 2009). Inquiry learning gives librarians opportunity to exercise more clearly their pedagogical action, guiding students in acquiring information literacy skills while working with teachers in the teaching of curricular content (Maniotes & Kuhlthau, 2014; Oberg, 2004).

Problem statement

In Brazil, since the 1960s, school librarians have been expressing concern about their role in the research process (Campello, 2003), feeling responsible for the development of a range of cognitive skills, showing wish to contribute in innovating the learning process (Carvalho, 1967). Currently, this function is clearly integrated in librarians' desired profile and therefore it is understood they should be prepared to perform it.

The perception that librarians in Brazil are not properly prepared to carry out this function (Campello and Abreu, 2005) has led some library schools to include in their curricula information literacy courses (Mata, 2014). In the School of Information Science of Federal University of Minas Gerais, an Information Literacy Course (OTI088) is offered since 2009 to undergraduate library students as a compulsory subject. OTI088 aims to raise awareness of future librarians to their responsibility in developing users' information literacy skills using inquiry learning as main instructional strategy, in order to make them repeatedly experience the research process. Over the time the course is being offered, some questions emerge, relating to how students react to this strategy.

Thus, the present study sought to investigate: 1) how students repeatedly exposed to strategies of inquiry learning react; 2) the difficulties they encounter during the process; 3) and what types of learning they acquire.

Literature review

Inquiry learning is a teaching strategy that seeks to stimulate students to be fully involved in the learning process. It is an instructional approach where students are encouraged to use higher-order thinking skills – for instance, analysis, synthesis, reflection, evaluation – in a critical way, and reflect on their learning (Detlor et al., 2012). The process starts with issues or problems – not just themes or topics – proposed by the teacher who motivates students to seek answers, raise other issues and create knowledge.

An enormous amount of research has been conducted on the subject of inquiry learning (Hmelo-Silver, Duncan & Chinn, 2007). In this context the contribution of library science is significant, being Carol Kuhlthau's work worth mentioning. Kuhlthau's model Information Search Process (ISP) incorporates three realms: affective (feelings), cognitive (thoughts) and

physical (actions) and is composed of six stages. In the *initiation stage* the common feelings are uncertainty and apprehension; optimism and readiness to seek are characteristic in the *selection stage*; confusion, doubt and frustration are common in the *exploration stage*, feelings that are replaced by a sense of clarity in the *formulation stage*; the *collection stage* is marked by the sense of direction and confidence and the final *stage of presentation* is marked by relief that can come either accompanied by the feeling of satisfaction or disappointment (Kuhlthau, 2004).

Kuhlthau's theoretical work served as foundation for the development of the idea of guided inquiry (Kuhlthau, 2007) that seems to reinforce the notion of mediation – or guidance – significantly present in the studies that support ISP model (Kuhlthau, 2004, p. 69). According to Kuhlthau, Maniotes & Caspari (2012, p. 8) “an important advantage of Guided Inquiry is the variety of different competences and knowledge that students develop while engaged in the inquiry process”. Curriculum content, information literacy, learning how to learn, literacy competence and social skills are the five kinds of learning that can be accomplished by means of guided inquiry (Kuhlthau, Maniotes & Caspari, 2012).

Recent research shows that active learning strategies yield more positive effects than passive instruction. Results in the study of Detlor et al. (2012), who investigated the use of active methods in teaching information literacy skills, suggest that active strategies have a direct effect on producing positive student learning outcomes, while passive strategies do not. The kinds of outcomes observed were: psychological (decreased anxiety/increased self-efficacy using online library resources, improved perceptions of online library resources, and improved perceptions of librarians in terms of helpfulness and value), behavioral (improved use of librarians) and the benefit outcomes of time savings and effort reduction in finding information (Detlor et al., 2012, p. 156).

Methodology

Data collection consisted firstly of an interview (conducted by the first author) with the instructor responsible for the course (the second author). Next, in-depth interviews with four students who volunteered were performed. These interviews (also carried out by the first author) were performed from one to 10 days after the end of the information literacy course and after the grades were assigned (December 2014). They lasted 25 minutes to one hour and were recorded and transcribed in their entirety.

The Information Literacy Course (OTI088) is a required subject, with a workload of 30 hours, offered on the 5th period of the Undergraduate Library Program. This means that when attending it the students are about halfway through the course, which has eight periods to be completed in four years. Most courses in the Undergraduate Library Program run 60 hours, so this is one of the few that have half the workload of the standard courses. It is offered in eight weekly meetings, each with four hours over two months (October and November/2014 in the case of the investigated class). The purpose of this course is to provide students with an understanding of the concept of information literacy as a basis for the librarian educational action. At the same time it gives them opportunity to exercise informational skills and reflect on them.

The interview with the instructor sought to clarify the teaching strategy used. As she said, inquiry learning is used over the 30 hours so that students go through four tasks on the

course topics. They are encouraged to search for information, reading, analyzing, evaluating and developing critical outcomes, whether in the form of written assignments, discussions and oral presentations which allowed the construction and sharing of new knowledge.

| Research question | Task | Outcome |
|---|---|---------------------------------------|
| 1 st assignment How the notion of information literacy presented by Brazilian authors converge? | Individual assignment (homework), carried out in the first week of the course, with individual assistance during the following week to students who needed support. 20 points. | Written text and classroom discussion |
| 2 nd assignment Are there Brazilian librarians who are playing an educational role in school? | Individual assignment (homework), carried out in the second week of the course, with individual assistance during the following week to students who needed support. 25 points. | Written text and classroom discussion |
| 3 th assignment What factors can facilitate the development of information literacy programs in school? Are these factors present in the Brazilian educational context? | Collective task, carried out in the 5 th week during class, based in texts provided by the instructor. 15 points. | Classroom discussion |
| 4 th assignment Who contributed to the development of librarianship in Brazil? What contributions were the most important? | Group project (homework), which began in the 2 nd week and held for six weeks, with oral presentation in the last class. The purpose was to provide students an opportunity to perform a longer assignment, which would allow the mobilization of a number of diverse skills. 35 points. | Oral presentation using Power Point |

Table 1. The four assignments of the Information Literacy Course (OTI088)

The interview with the students started with questions about their expectations for the discipline, that is, if they knew something about the course or the instructor in advance. Then questions were asked about each of the four assignments carried out. For each one the

feelings of the respondent at the beginning (when the assignment was proposed), during its implementation and after its completion were investigated. The next question sought to know if the student used the second chance to improve his/her grade, since there were times when the instructor allowed the assignment to be redone or that the student took a test to replace a bad grade. Following, questions about the students' perception on what they had learned in each assignment, the difficulties faced and the strategies used to develop it were made. In the last part of the interview questions were raised concerning the participants' impressions about inquiry learning strategy and suggestions for the course improvement.

Data analysis was based on the ISP model (Kuhlthau, 2004) and in the five types of learning suggested by Kuhlthau; Maniotes & Caspari (2012, p. 8), that are: curriculum content, information literacy, learning how to learn, literacy competence and social skills.

Data analysis

Expectations for the course

Data indicated that the previous reference that students possessed of the course was related more to the teacher – mainly because of her publications (articles and books on school library) and her visibility not only at the University but in the Brazilian context – than actually to the course subject (information literacy). None of them had attended another course with that Professor, and if some participants knew her was only in sporadic contacts.

Most respondents had a first contact with the subject – information literacy – one or two months before the beginning of the course, because in other compulsory course they have attended they had the opportunity to study various types of literacy, including information literacy. Some showed curiosity about what would be covered in the course, but only one of the interviewees had a specific strategy to prepare to take the course. She said she searched – on her own initiative – for texts written by the course instructor that focused on information literacy. She located and read two of them a week before the course started. She explained: "Since everyone else said the course was very difficult, and we had a week off between courses, so what did I? I found two texts by her (the course instructor) on Information Literacy, and gave it a quick skim". As the interviewee indicated, it is a common students' strategy to ask colleagues who already took a course on its difficulty. For this the main informants were former students, colleagues of later periods.

Kinds of learning

According to Kuhlthau, Maniotes and Caspari (2007, p. 8) "an important advantage of Guided Inquiry is the variety of different competencies and knowledge that students develop while engaged in the inquiry process. When inquiry is guided in this way, students accomplish five interwoven, integrated kinds of learning". During the interviews it was possible to detect indications that the students developed all these types of learning to a greater or lesser degree. Table 2 summarizes how respondents described what they learned from the course:

| Kinds of Learning | Competencies developed | What the respondents learned |
|-----------------------|--|--|
| Information Literacy | Concepts for locating, evaluating, and using information | "... Select information, collect, develop [use]. Unfortunately our high school is deficient in this matter; at least in government schools. In private schools I do not know how it is" (E1). "... you have to really understand and know how to use the databases, to know what the sources are and what you cannot use, what is reliable and what is not. Then I realized that it is not easy, is not simple, but I liked the research process" (E3). |
| Learning how to learn | Self-directed learning and personal interaction within the inquiry process | "I learned to build, to make the search path, what we need to do in a research task, so you find a subject that you want to search, that you want to talk about. This was the best learning I had in the entire course, not only in this assignment, but in the whole course" (E3). |
| Literacy Competence | Reading, writing, speaking, listening, viewing, and presenting | "I learned to better organize the information in a text, to write and present my work. The text should include a purpose statement, the methodology; yah ... I think the analysis methodology and the conclusion" (E2). |
| Social skills | Interacting, cooperating, collaborating, habits of mind, dispositions in action | "And then each one searched a topic and shared it. Then later we met in the library and assembled the text (...) we were all enthusiastic. We even discussed about the author, right? We talked about him; so there was a lot of material" (E2). |
| Curriculum content | Constructing new knowledge, interpreting, synthesizing, and applying facts and ideas | "I learned that Librarianship has a history here in Brazil. Where did these persons live? Are they still alive? ... And that these persons had a very strong role in Library Science and even [contributed] to the recognition of the profession" (E2). |

Table 2. Five kinds of learning through Guided Inquiry – Adapted from Kuhlthau, Maniotes and Caspari (2012, p. 9) with data collected during interviews (December, 2014).
Information Literacy

Participants mentioned that the experience of learning through research, rather than lectures, to which they are more accustomed, enabled them to exercise and enhance skills to locate, evaluate and use information.

Some respondents mentioned their inability to use specialized electronic databases to locate information sources and provided positive feedback on the practical lessons in the course, when they were guided by the instructor in this process.

Although Kuhlthau, Maniotes and Caspari (2012, p. 10) mention that finding information is an easier task than to evaluate it, there were few comments from the respondents on the issue of text interpretation. This probably was due to the fact that they were unaware of the degree of difficulty with this task. Among the respondents, there were those who did well in the whole process, but most showed a high level of difficulty, especially in the first assignment, which explains the repeatedly use of the inquiry learning strategy by the instructor in order to enable students to mobilize new information skills. The performance of students in the first assignment showed that many do not even come to understand what was required of them.

The instructor gave to those who had not fared well in the first task the opportunity to redo it after it was discussed in class, when they shared their results to build a body of common knowledge. Only one respondent said she did not have to go through this process because she had achieved a good result at the first attempt. When asked about the discussion in class, where each student had the chance to evaluate her/his own work, this respondent described her colleagues as naive, because they had not completed the task as required: "I do not know if I can talk about the class as a whole, but I found that the folks were a little naive. They did something that was not what the instructor was expecting. They were naive, both in the text construction, in the search and in the text production. So what the instructor was expecting was not what the class presented. Most of the class did not share what they had done." On one hand, this can be regarded as a difficulty in evaluating and interpreting the text and, therefore, in the use of the information. On the other hand there is a perceived lack of involvement of a large part of the students in the learning process. This is reinforced when, given the opportunity to redo the work, many of them had not yet improved their performance.

Learning how to learn

Students compared the proposed assignments in the Information Literacy Course with those they were doing in other courses, and emphasized the autonomy that is distinctive in the former. According to them, previous assignments they did were so "stiff", meaning that they were already defined *a priori*: the title, content, structure, etc. Now they had the freedom to create, to give the title, select sources and trace the paths. For many of them this was the first opportunity to do that, as rarely in the basic education level or even at the undergraduate level they were given the opportunity of learning through guided inquiry.

When asked about the feelings experienced when the first assignment was proposed, respondents who mentioned tranquility were the ones who said they had already studied the subject (information literacy) in an earlier course. Kuhlthau (2004) considers that one of the first actions in the initial stage of the search process is to try to relate the problem with past experiences. The author also emphasizes, as a corollary of the uncertainty principle, the fact that feelings and emotions experienced vary between positive and negative throughout the process.

In this study, the feeling of apprehension was mentioned when the respondent referred to the fact of not knowing what to write. The answer of one respondent illustrates the variation of emotions peculiar to the research process (Kuhlthau, 2004), showing how she learned how

to learn and to deal with her emotions: "I was apprehensive because I did not know what I would write. But after I read the text, I made my notes, and then I went to prepare the text to be delivered, and then I was already relieved."

Literacy Competency

The best way to learn every aspect of literacy competency – namely reading, writing, speaking, listening, viewing, and presenting – is to practice. Therefore in the Information Literacy Course the development of several assignments using the strategy of inquiry learning were repeatedly proposed. It was clear to the respondents that the course should be longer. All said they would like to have had the opportunity to do an intermediary assignment between the first and the second one – even though they had a chance to remake the first. One student said: "My suggestion is that the course should be 60 hours long for us to have a little more time to develop the tasks. Maybe between the two first assignments we could have a third, so students do not feel that leap, perhaps more assignments with opportunity to write because I miss writing, I feel a lot of difficulty." About the second assignment it was evidenced also a sense of security gained from the first: "I did it [the second assignment] with more will. I read more, the ideas, the proposals, right? I had more courage".

One of the stages that deserve to be detailed is presentation. Different strategies of presentation were adopted for the proposed assignments. In the first, students should submit a written report which, after examination by the teacher, would be led to discussion with the class. Each student should present to the colleagues the concept of information literacy of one particular author, and in the debate points of convergence and divergence would be raised. In the second assignment the presentation of a written text also was expected of each student, followed by a debate in the class. In this case the text was based on the question "are there in Brazil librarians who play an educational role?" A third assignment was conducted collectively with the whole class and not individually by each student. In relation to this case, it was perceived in the interviews that none of the respondents referred to it as part of the inquiry learning process. One cannot say that it was because an information search or a written assignment were not required – the task was done in one class period, after they read a text chosen by the instructor, or whether the subject did not interest the students. The fact is that none of the respondents referred to the third assignment as a process of inquiry learning. In every interview, when asked about this class or this assignment, students showed up scattered or confused. Finally, there was a fourth assignment providing opportunity for a formal oral presentation of a group project, which was developed during six weeks.

It was perceived that in the presentation stage of the tasks the participants reacted in different ways to different forms of task presentation. One said: "I'd rather write than present verbally. Everyone knows that I'm not very good at presenting, but anyway ...". On the other hand, a student who did poorly in written assignments described his oral presentation as follows: "I said to the instructor, 'if I could stay here two hours talking about the topic I searched, I could go without repeating anything', because I was prepared, I was excited about this thing".

For many respondents the individual and written presentations were more profitable than the discussions in class. Individual talking with the instructor about the tasks seems to have been an important factor in learning because some respondents (regardless if their performance

was good or not) cited this strategy as positive for their learning. One respondent said: "... I felt safer after her evaluation ... not because of the grade, but because of the comments she made". Other stated: "Well, I felt I needed to improve. She said 'this is wrong, you have to clarify this part [in the text] ... Then the next text was better".

The success of an oral presentation depends not only on the student's commitment to learning, but also of the participation of the classmates, which does not always occur. In the case of this class in particular, the presentation of some groups coincided with a national university library conference that occurred in the city. For this reason, many classmates were absent attending the conference.

The presentation also generates emotions and feelings in the presenter, because it is the stage of completion of the research process. There is an anticipated tension to present to an audience of people interested in the subject. One of the respondents revealed his disappointment: "... I was very upset when I was to present my work; there were only about eight persons in the room. The people came late. I was really upset about it". At this point all the commitment and dedication of the instructor is useless. For the student this is not an individual commitment as the presentation of a written text. It is a stage that requires interaction. If this does not occur, a part of the process is not complete. When a person prepares a presentation, he/she presupposes an audience. Here the focus is speaking and listening skills. While a group of students is mobilizing speaking skills, it is expected that the audience exercises listening skills, which seems not to have occurred.

Social Skills

Social skills were encouraged and necessary in practically every step of the process. Even when the assignment required a written text, there was a further step in that the knowledge produced was shared with classmates. In addition, each student should individually engage in interaction with the instructor, the librarian, with colleagues, that required mutual cooperation and collaboration.

Participants mentioned visits to the library and interaction with the librarian, which was named by her first name, in a friendly way, as someone who helped and shared the difficulties of the research. One respondent said: "... and then I realized that the research process, when you have to use information sources, it is really more complex; you have to know how to search, you must know where to search, what to do, seek help from the library people, to [the librarian]; I asked for help".

Ask for help to colleagues who previously took the same course was also a common strategy, which revealed the existence of an informal learning community. There were many references to this kind of advice, especially in the beginning of the course, when the "rules of the game" were still unclear: "So I also asked some folks for help, who had already taken the course, so I asked for any tips, like what were the methods of the instructor; if she liked long texts, only one sheet, or if she wanted two, what she liked in a text, the structure of the text ...".

Finally, cooperation between classmates was evidenced by the aid they offered each other in clarifying and implementing individual projects, but especially when the final assignment was proposed, which was a group project. One respondent mentioned that "Together it's easier

because everyone is already used to do group projects, then we take advantage of more information from each one in the group, each one can contribute better."

Curriculum Content

When asked about what they learned from each assignment, most respondents answered about having learned to write, to structure a text, to make a presentation, to develop the steps of a thorough research, to investigate. In addition, they learned curriculum contents. One participant said: "I realized that Brazilian librarians are already using the concept of information literacy" (2nd assignment) and "I learned that the library has a history in Brazil" (4th assignment).

It could be observed that when there was little learning in other categories, this also reflected in the learning of curriculum content. It seems the topics could have been better assimilated if, for example, the social skills of collaboration and cooperation were better used, if the listening skills were more practiced, if the commitment of students with learning was greater. Probably by the suggestion of respondents, for the Information Literacy Course to be longer than 30 hours, it could be possible to get greater involvement of students, thereby improving social skills and competences thereof.

Matching methodology and curriculum content

The study investigated what understanding the students had at the end of the course about information literacy, after having experienced the strategy of inquiry learning and after having worked with the concept. In the interview the question was asked as follows: At the end of our conversation, briefly define what you mean by information literacy. Definitions presented by the respondents were:

E1: Teaching and learning.

E2: To know how to use information well.

E3: To know what you are doing and what skills you have.

E4: To search information anywhere and to be able to use the information to turn it into knowledge.

Then they were asked: How do you relate the strategy that was used throughout this course with the concept of information literacy? The relationship was readily established. The strategy of the course was inquiry. Inquiry is to find and use information to learn. It was clear that the essence of the process was seized. It was noticed, throughout the investigation, much immaturity and a lack of student's commitment to the learning process, but it can be assured that the strategy should continue to be applied, and should be improved, as the students are having a positive result from the experience. Those most affected are getting – and this is quite clear by analyzing their interviews – plentiful experience in all the five kinds of learning. Some are still having incipient experiences, but even those are at least assimilating the major point: the essence of the concept of information literacy and of inquiry learning strategy, and they are also establishing the relationship between theory and practice.

Limitations

It is recognized that the study's results are constrained by certain limitations and that they cannot be generalized. First, results must be viewed in the light of a small sample (although seven students have accepted to participate and have scheduled the interview, only four

attended) and as a means of providing the basis for further investigation. Participation of the course instructor may have influenced the students' statements. Although her participation was minimal, the students interviewed were aware that she would know the results. On the other hand, this fact did not appear to inhibit participants.

Conclusions

In response to the objectives proposed by the survey, it's noticed that the library students, when first exposed to learning inquiry strategies, reacted with bewilderment and apprehension, using different strategies such as seeking help from colleagues who have already taken the course. As the process was being repeated, however, they felt more comfortable and safer. Repetition is seen as important for getting confidence and learning to learn. The main difficulties encountered in the process relates to the understanding of what was required, with finding information in electronic databases and with the lack of autonomy that students felt to develop alone all the steps of a search. Finally, it was evident that they had all five types of learning provided in guided inquiry (Kuhlthau, Maniotes & Caspari, 2012).

Future research should investigate the subject using an expanded sample that enables comparison between students in relation to different variables as their seniority level, age, engagement or level of interest.

Since the present study relied mostly on subjective perceptions, further studies could use more objective measures of learning comprising a bigger sample.

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Title in Portuguese: Aprendizagem pela pesquisa: educando os bibliotecários para sua função educativa

Abstract in Portuguese

A aprendizagem pela pesquisa é um conceito familiar para bibliotecários brasileiros, que têm manifestado preocupação sobre sua contribuição em inovar o processo de aprendizagem. A percepção de que os bibliotecários no Brasil não estão devidamente preparados para desempenhar essa função tem levado alguns cursos de Biblioteconomia a incluir em seus currículos disciplinas de competência informacional. Na Escola de Ciência da Informação da Universidade Federal de Minas Gerais, desde 2009, essa disciplina é oferecida aos alunos do Curso de Graduação em Biblioteconomia, com o objetivo de conscientizar os futuros bibliotecários sobre sua responsabilidade no desenvolvimento das habilidades informacionais dos usuários. Neste curso, a principal estratégia didática é a aprendizagem pela pesquisa. O presente estudo tem como objetivos investigar: 1) as reações de alunos expostos repetidamente a estratégias de aprendizagem pela pesquisa; 2) as dificuldades com que se deparam durante a disciplina; 3) e quais os tipos de aprendizagem adquirem. Os dados foram coletados por meio de entrevistas em profundidade com alunos que

cursavam a disciplina Competência Informacional no primeiro semestre de 2014 e que se voluntariaram. A análise foi baseada no modelo Information Search Process de SP (Kuhlthau, 2004) e nos cinco tipos de aprendizagem sugerido por Kuhlthau; Maniotes & Caspari (2012, p. 8): conteúdos curriculares, competência informacional, aprender a aprender, habilidades de leitura e escrita e habilidades sociais. Os resultados, que não podem ser generalizados, revelaram que os estudantes reagiram de maneira positiva à estratégia, embora tenham relatado diversas dificuldades. Concluiu-se que a repetição do processo de pesquisa fez-se importante para que os alunos se sentissem mais seguros e confiantes e que suas dificuldades fossem minimizadas. No conjunto dos entrevistados foi observada a aquisição dos cinco tipos de aprendizagem.

Biographical notes

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