

Service learning and literacy tutoring: Academic impact on pre-service teachers

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Abstract

How does service learning impact content acquisition? Undergraduate pre-service teachers participating in a literacy tutoring service-learning experience are compared with pre-service teachers engaged in self-selected and independently directed tutoring sessions. The findings of this study support previous assertions that service-learning positively influences student academic achievement. The data gathered provide evidence that this positive influence is related to several design features. Specifically, the value placed on the service increased student motivation to learn course content. The frequency and variety of opportunities to reflect coupled with academic goals being embedded into the actual service experience strengthened connections between service and academic content.

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1. Introduction

1.1. Addressing the research gaps

Between 1987 and 2002, the number of institutions of higher education in the USA utilizing service-learning (SL) pedagogy expanded from 98 to 868 (Campus Compact, 2003). With this expansion, both advocates and detractors have increased their call for research to provide evidence of the effects of service learning on student academic achievement. Giles and Eyler (1998) noted that SL research has grown, but also emphasized that many questions remain unanswered. Consistent with the findings of Giles and Eyler (1998), Billig (2000) and Eyler (2000) both reported that upon critically analyzing

the body of research studies, most of the research has documented the benefits of service learning in terms of personal growth and commitment to civic responsibility. However, there appeared to be a gap in the research in terms of the amount of knowledge gained or the impact service learning has had on students' acquisition of pedagogical knowledge. The information gap between the benefits of personal growth and the necessity of knowledge acquisition is the framework for the current study.

The present research was conducted to address the research gaps posed by these leaders in the SL field. Specifically, a call for inquiry that measures the impact SL has on students' acquisition of specific content knowledge and skills has been made (Billig & Furco, 2002). Further, the designs of SL curricula that lead to an accumulation of knowledge about "best practices" are needed (Billig, 2000; Eyler, 2000). In general, the call has been for

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research to be conducted that addresses the gaps in our understanding of the effects that SL has on academic achievement as well as determine the ways this impact is differentiated across SL contexts (Eyler, 2000).

When service learning is infused into teacher education, it allows pre-service teachers to go beyond the boundaries of university classrooms and connect theory to practice inside meaningful, authentic experiences (Dodd & Lilly, 2000). Service learning has been noted to develop pre-service teachers' professional skills by "providing additional means for reaching educational objectives, increasing student interest in the subject matter, teaching new problem-solving skills... and expanding course objectives to include civic education" (Bringle & Hatcher, 1996, p. 222). More specifically, Erickson and Anderson (1997) reported that engaging pre-service teachers as "service learners" helps learners to better understand course content.

Narrowing the focus to service learning within teacher education programs further highlights the need for research to address these gaps in understanding. The National Service-Learning in Teacher Education Partnership (1998) reported that approximately one-third of teacher education programs in the US provide SL experiences for pre-service teachers, and that many of these experiences involve tutoring children or adolescents (McCabe & Miller, 2003). The research in such contexts has provided evidence that tutorial reading programs are beneficial for both tutors and tutees (Fitzgerald, 2001; Good & Brophy, 2003; Jacobson et al., 2001; Malone, Jones, & Stallings, 2002; Vadasy, Jenkins, & Pool, 2000). However, while these tutorial contexts vary widely in procedures, purposes, and structures, they have been compiled into one single group of studies representing "pre-service teachers engaged in SL tutoring". In consequence, the contexts and specific designs of various reading tutorial programs have not been explored in any depth. Therefore, it is not known how the findings regarding service learning may hold across contexts.

Further, and the point of the current study, the emphasis of research studying reading tutorial programs has neglected the impact of such programs on the tutors' acquisition of pedagogic knowledge in literacy. This is the focus of the current study. Several studies emphasized the effects on the children being tutored (Fitzgerald, 2001; Hedrick, 1999; Invernizzi, Juel, & Rosemary, 1996/1997; Vadasy et al., 2000). Focus on the pre-service

teachers as tutors has mainly regarded effects on their reading ability or enjoyment of reading (Jacobson et al., 2001; Juel, 1996), their self-concept (Good & Brophy, 2003), their attitudes toward social issues (Fresko, 1997; Malone et al., 2002), but not on the pedagogical knowledge they may have gained.

The intent of this study was to compare how SL experiences and field-based learning experiences impact pre-service teachers' acquisition of course content. Specifically, the questions posed were: (1) Will pre-service teachers' understanding literacy assessment techniques differ between an embedded SL tutoring experience and a field-based tutoring experience? and (2) What design characteristics of such experiences provided the greatest impact on pre-service teachers' academic achievement?

2. Method

2.1. Participants

Four sections of an undergraduate teacher education "Linking Literacy Assessment and Instruction" course were selected to participate in this study. The pre-service teachers ($N = 63$) who were selected to participate in this study were organized into two comparison groups. One group of pre-service teachers ($N = 34$) participated in an embedded SL experience, in which they attended the "Linking Literacy..." course at a local community center and spent an hour each week with the university course instructor working as tutors with elementary students in a one-to-one basis at the community center. The second group of pre-service teachers ($N = 29$) participated in self-selected and independently self-directed weekly, hour-long field-based tutoring sessions (IND). The IND group also had the "Linking Literacy..." course instruction on campus where that course was connected to the independent tutoring through in-course activities. All participating pre-service teachers in both groups used comparable literacy assessment tools with tutoring clients; analyzed the literacy needs of their clients; planned for and implemented literacy strategies to meet diagnosed needs of the clients.

2.2. Data collection

As a mixed design study, a combination of quantitative and qualitative measures was utilized to investigate both of the research questions. This

use of mixed methods was selected to provide a more comprehensive view of the experience. Quantitative measures consisted of a pre/post survey of literacy assessment methods (Appendix A) and a pre/post literacy content knowledge test (Appendix B). Qualitative measures consisted of an open-ended questionnaire (Appendix C), focus group interviews, and students' written reflections.

The first quantitative measure, a 20-item Likert-scale survey of literacy assessment taken from a course text (Mariotti & Homan, 2001, p. 9). It was used as a pre/post survey that was administered during the first and last class sessions of the semester. This survey provided a self-report of the pre-service teachers' perceptions of their personal knowledge and competence regarding various literacy assessment tools and techniques. Each item required the students to rate their prior knowledge and on a scale from 1 (not familiar) to 5 (highly skilled). The 20 survey items were categorized into three theoretical components based on the overall course objectives: (1) administering assessments (e.g., "administering a running record to a child"); (2) interpreting and analyzing assessment results (e.g., "analyzing and scoring a running record"); and (3) utilizing assessment data to design and implement instruction (e.g., "using running record to design appropriate instruction"). We assumed that this assessment had a reasonable degree of content validity as it was taken from the text required for the course. The complete survey is presented in Appendix A.

The second quantitative measure, a reading content knowledge test was developed and used as a pre-post test that was administered during the first and last class sessions. This test consisted of 30 multiple-choice items selected from the teacher resource materials accompanying the other course text (Gillet, Temple, Crawford, & Cooney, 2003). Items were selected by a panel of experienced practitioners in the field of reading, in conjunction with the course instructors, to correspond to the three theoretical components established in the categorization of survey items. Prior to administering this measure it was tested for reliability. Professional teachers ($N = 31$) enrolled in two separate sections of a graduate level History of Reading course responded to the test. Test-retest reliability was moderately high (.82) across a three-week interval of administration. The content knowledge test is presented in Appendix B.

For the qualitative data, the following procedures were used in order to investigate how students

perceived their experiences. Thirty-minute, semi-structured focus group interviews were conducted with each group of participants midway through the semester and at the conclusion of their tutoring experiences. All interviews were taped and transcribed. During this same time frame, an open-ended questionnaire was also administered (Appendix C). Both of these data collection tools consisted of similar questions, designed to investigate how the tutoring experiences were impacting the pre-service teachers' academic achievement and reciprocally, how the course content was impacting their tutoring experiences. To provide further data triangulation, all participants' weekly reflections (a course requirement) were collected at the end of the semester. Themes from the reflection logs were compared with those derived from focus group interviews.

2.3. Procedure

Prior to the start of the semester, the four instructors involved in this study collaborated to establish the theoretical framework that would guide the construction of the learning contexts for their respective sections. As a group, the instructors agreed that knowledge was a function of the experiences in which it is situated and, therefore, needed to be presented in authentic settings that would normally involve such knowledge, or the ordinary practices of the culture practitioners participate in to develop and strengthen their tools of practice (Brown, Collins, & Duguid, 1989; Lave, 1988; Wenger, 1999). From this premise, a tutoring component was incorporated into all of the course sections to provide opportunities for pre-service teachers to apply and transfer learning from theory to practice through authentic learning experiences. The enactment of the two different tutoring groups is described below.

2.3.1. Independent tutoring experience

The independent tutoring experience (IND) is best described as a field-based experience, in which the pre-service teachers applied content and professional knowledge in authentic situations. These pre-service teachers were each directed to select a struggling reader from their local contexts, such as their neighborhoods or church communities, and to provide these children tutoring assistance with their literacy skills. These independent and unsupervised tutoring experiences took place at public libraries, school libraries, bookstores, and within the tutor or the tutee's home. Within the IND tutoring experience,

tutors wrote reflections following each tutoring session. These written reflections were then discussed during the weekly class meetings of the “Linking Literacy...” course. During class activities and through the reflective group discussions, peers had opportunities to collaborate in their plans for tutoring and compare results.

2.3.2. SL tutoring experience

In the embedded SL course, the pre-service teachers all worked simultaneously at a local community center in implementing an after-school tutoring program. These pre-service teachers attended the meetings of the “Linking Literacy...” course at the community center, and during that time, spent an hour working as tutors with elementary students on a one-to-one basis at the center. Within the SL tutoring experience, reflective group discussions immediately followed the tutoring session and took place within the context of the community center. The SL pre-service teachers then wrote their individual reflections as an assignment to be discussed during the next week’s class session. These pre-service teachers interacted during reflective group discussions, class activities and during the tutoring sessions. While tutoring, peers observed each other negotiating lessons, collaborated to implement lessons or discussed questions. During the tutoring sessions, the instructor also interacted directly with the pre-service teachers to intervene, provide support or offer feedback.

3. Results and discussion

3.1. Quantitative data—survey results

To address the first research question, the raw data from the survey were aggregated by group and

were compared across groups to determine if there were particular outcome patterns between the respective courses. There were no statistically significant differences in mean performance between the two groups in any of the pre-survey categories; Administering Assessments ($t = -1.51$, $p = ns$), Analyze/Interpret Assessments ($t = -2.53$, $p = ns$), Designing Instruction ($t = -1.98$, $p = ns$).

Upon analysis of the survey data comparing pre/post mean scores, a general pattern was evident that both groups of pre-service teachers reported a higher self-assessment within each theoretical component as well as in their overall knowledge acquisition (see Table 1). Mean gains were calculated for each group of pre-service teachers. The use of these means was appropriate because both groups started out with very similar pre-survey means. Therefore, any differences in gain would not likely be due to either growth curve effects or regression to the mean.

A t -test of mean difference was conducted for the total survey composite score. A mean difference in composite survey scores between groups was found significant at the $p < .05$ level, gains within each theoretical component were calculated and compared. The results are presented in Table 2, and show consistent differences in gain scores that favor the $s-1$ context.

3.2. Quantitative data—literacy knowledge test results

Also directed toward the first research question, Table 3 presents mean pretest, posttest, and growth differential scores of IND and SL tutoring groups on literacy knowledge acquisition. Pretest scores indicated no statistically significant differences between groups. However, a t -test analysis showed

Table 1
Means and standard deviations of survey pretest and posttest comparing independent and service-learning tutors

Group	Administer	Analyze/interpret			Design instruction		Total survey	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
<i>Independent (n = 29)</i>								
Mean	2.6	3.4	1.94	3.57	2.7	3.24	2.3	3.16
SD	0.67	0.75	0.67	1.06	0.84	0.88	0.7	0.84
<i>Service-learning (n = 34)</i>								
Mean	2.82	4.37	2.36	4.52	3.02	4.31	2.7	4.23
SD	0.47	0.41	0.64	0.41	0.7	0.62	0.5	0.44

Table 2
t-test results of differences in mean gains on survey items

Group	Administer	Analyze/interpret	Design instruction	Total
Independent	0.81	1.24	0.52	0.86
Service-learning	1.55	1.88	1.32	1.58
Difference in growth	0.746	0.63	0.79	0.72
	<i>t</i> = -3.26*	<i>t</i> = -2.12*	<i>t</i> = -2.51*	<i>t</i> = -2.78*

**p* < .05.

that for both groups, growth was statistically significant compared to the pretest scores. Further, a *t*-test analysis also demonstrated that SL tutors scored significantly higher on the literacy content knowledge posttest ($M = 79.82$, $SD = 5.65$) than did the IND tutors ($M = 72.55$, $SD = 9.59$), ($t(61) = -6.29$; $p < .0001$).

3.3. Qualitative data—questionnaire

In order to address research question two, content analysis was applied to responses from the open-ended questionnaire to gain additional insights into the pre-service teachers' perceptions of what components of the course design (Context of Design section) most influenced their academic growth. The responses were synthesized by groups and compared between groups. A majority of the participants from both courses (IND 75%, SL 100%) reported that the tutoring had the most impact on their learning course content. Common themes that emerged from both classes as reasons to explain this impact were: "actually being able to apply what was learned", "the opportunity to see how it works with a real child", and "doing helps understanding".

As evident from the data analysis results, the SL group, self-reported higher ratings in all three course objectives: (1) administering assessments, (2) interpreting and analyzing assessment results, and (3) utilizing assessment data to design and implement instruction. Combining these results with the fact that 100% of the SL group reported that the tutoring experiences had the most influence on their academic achievement, necessitated an analysis of the interviews, written student reflections, and field notes to understand the influences leading to this higher perception of skill and knowledge acquisition. The triangulation of these data sources lead to specific programmatic factors that mediated the pre-

Table 3
 Comparison of content knowledge test results

Group	Pretest	Posttest	Differences in growth
Independent	67.4	72.55	5.14
Service-learning	65.15	79.82	14.68
	<i>t</i> = .86	<i>t</i> = -3.59**	<i>t</i> = -6.29**

***p* < .001.

service teachers' academic growth and provided a deeper understanding of the impact these specific factors had on their academic achievement.

Investigation of the research questions entailed the exploration of both the content knowledge acquisition of pre-service teachers and the contexts in which this development occurred. So the questions then became, "If both groups reported that the tutoring experiences facilitated their learning, why did one group report their learning at a higher level? In what ways did the SL context promote a sense of higher academic achievement?" The themes that guide this discussion were derived from systematic analysis of the qualitative data. A discussion regarding the transformative relationship between the service experience and the course content will provide a metaphor to describe how the SL context impacted academic achievement and what design characteristics facilitated that impact. The following themes were derived using recursive analysis in a constant comparative method (Bogdan & Biklen, 1998).

3.4. Development of ownership

Tutoring provided students an opportunity to engage in a real-world experience, applying the skills and tools learned in class in what was, for

them, “real literacy” (Willinsky, 1990). As noted by Dewey (1966), deeper learning requires the learner to see meaning and relevance in the experience, and this meaning and relevance will “depend on the degree to which learners are able to make learning their own” (Dudley-Marling & Searle, 1995, p. vii). One key to developing ownership of learning evolves from structures and processes that promote learner responsibility, power, voice, and autonomy (Dudley-Marling & Searle, 1995). These structures and processes will be elaborated in the following sections.

3.4.1. *Responsibility*

It was within the tutoring experiences that the greatest difference between the two course sections could be noted. The IND pre-service teachers reported that this experience provided them an opportunity to “practice” their skills, or to apply what they were learning. For this group of students, it appears that the relevance of the experience was equated to that of another learning assignment. The following quotes are from IND pre-service teachers’ describing how the tutoring was meaningful to a prospective educator.

Well, it wasn’t really tutoring; it was more like assessing students. I am a hands on person, and I know I wouldn’t have understood the assessments unless I was forced to do them (Written reflection IND#13, 11-8).

It really helped me practice how to do all of the assessments (Written reflection IND#16, 11-8).

Getting a chance to practice what you hear about really makes it stick. It’s one thing to just read a book, but to do it really helps (Written reflection IND#8, 11-8).

In the SL context, the pre-service teachers understood the tutoring that they provided as important and “real”. Therefore, the tutoring act itself provided students the opportunity to take responsibility for their own learning. As these quotes demonstrate, these pre-service teachers took responsibility for their own learning because they felt accountable to the child they were tutoring.

The tutoring gives me more of a reason than “I will be a teacher in a couple of years,” it’s more like “I need to know this information to tutor in an hour, and then next week, and so on (Written reflection SL#22, 11–15).

Service-learning is beneficial to the learning process. It allows you to become a part of what it is you are learning about. It makes everything you learn authentic and adds purpose to the content. This experience has made me feel more confident as a future teacher and a student (Written reflection SL#30, 11–15).

We are sending out a message that we care for the improvement of the community by helping the students with a subject that is going to play a major role in their life (Written reflection SL#25, 11–15).

Academically, I felt I had to work harder and pay closer attention to the course content because what I learned in the class I may be able to carry through to the service-learning tutoring session, so I had to be sure that I knew what I was doing (Written reflection SL#28, 11–15).

Therefore, the need for the tutoring was established as a community need with real consequences. Therefore, the SL pre-service teachers perceived the tutoring as valuable, and this motivated them to take responsibility for their learning. As one student said during a reflective discussion:

The service-learning project has been a positive experience to me academically, ... you really need to digest the material that we are presented with in order to use it correctly as a tutor. I also feel my mind set was changed, I was no longer learning something for a test, I had to learn it and know it or I may fail my student (Written reflection SL#18, 11–15).

3.4.2. *Voice+Power = Autonomy*

According to Rogers and Freiberg (1994), learning is facilitated when the learner has control over the nature and direction of the learning process. Structures within the social context of the learning must provide spaces for students’ voices to be heard. Beyond just having the space to be heard, however, the learner must also see that their voice has value. Within both contexts, IND and SL, student voice was given a space during group reflective discussions. As evident in the following excerpt from a reflective discussion after the fourth week of tutoring, this time of reflection provided opportunities for students to witness how their voices had power; their interests, ideas, and concerns expressed

during these discussions led to negotiating course content.

The SL context opened spaces for students' voices. These discussions often led to transformations in the course content, as described above, and in transforming the context of the SL experience itself. The following dialog provides an example of such transformation:

Melanie: Today we worked on Echo Reading, which I could see is a good strategy to help Javon stop guessing words based on the beginning consonant sound. The noise level, however, is too high in the room and he has trouble concentrating and staying on task.

Instructor: What do you think we could do to fix it?

Shonda: Well, if we were allowed to go outside, it might spread the students out and make it less noisy (SL group discussion, 9–21).

In the session that followed this vignette, the students presented their case to the director of the community center, who subsequently gave permission to the students to work with the children outside and around the community center property. That afternoon, in a written reflection (SL#30, 9–28), Melanie commented, "By the way, class went much better today since we could go outside. There were much fewer distractions". Another example of student voice transforming the SL context was a request to extend the transition time between class instruction and the tutoring session. This extension was requested to allow the students more time to gather and prepare their instructional materials. However, extended transition time meant negotiating with the community center staff, a task the tutors successfully performed. Such instances, explicitly and concretely showed the students the power they held to transform and control both what they were learning (the content of the course) as well as how they would learn (the context of the service experience itself). Therefore, the SL setting represented a context that valued the SL pre-service teachers' voices. Recognizing that their voices held power to control the learning environment motivated them to take ownership for that environment, in particular, by suggesting changes that would facilitate their acquisition and application of in-

structional strategies that would strengthen their tutees' literacy skills.

3.5. *Evolution deconstructed*

The structures and the processes enacted within the SL context in this study align with the structures Dudley-Marling and Searle (1995) reported to develop student ownership of learning. However, in both studies, student ownership of learning evolves from these processes and structures, and cannot be considered an isolated effect. Analysis of this evolution of process and structure that incubates student ownership highlights the essence of the SL context as compared to the IND context. Vygotsky's (1978) theory that learning emerges first on a social or interpersonal plane and then later on an internal or intrapersonal plane provides the basis on which to frame this process of evolving student ownership. In this study, the evolution of student ownership can be viewed as the process by which SL pre-service teachers acquired literacy assessment and teaching methods as they gained personal understanding through observing, reflecting, and engaging with peers, child tutees, the course instructor, and community members. The following themes derived from student data support the Vygotskian framework.

3.5.1. *Interactions as scaffolds*

In viewing learning as a process of evolution from a social to an internal plane, Vygotsky (1978) suggested that it is during this transitional phase that learning depends on guidance, explanation, demonstration, and interaction with more knowledgeable teaching/learning partners. Although both classes were designed to promote collaborative teaching/learning, the socially grounded, or embedded, nature of the SL context afforded opportunities to interact with each other and with their instructor while tutoring. The IND context only provided student and instructor interaction during scheduled class time. SL pre-service teachers reported that interactions with their instructor facilitated their learning, through active guidance, modeling, and coaching, all at the point of need (Nelson, 1991).

I remember my instructor coming over to me one day while I was watching the children playing and he showed me a way to listen to the students' oral conversation and turn it into a

comprehension strategy. I thought to myself, WOW, I would have never thought of that (Written reflection SL#24, 11–15).

You don't have to feel the pressure of performing wrong, since the instructor's there to guide you throughout the process (Written reflection SL#22, 11–15).

Having the direct feedback from the teacher to help us understand why something didn't work or to find a better way to do it helped me a lot (Written reflection SL#16, 11–15).

I have been able to ask questions and learn from other students in the class from their experiences with their students, and ... just by observing how my professors interacted with the students (Written reflection SL#21, 11–15).

The instructor's presence as a guide helped students connect new information to their experiences, figure out new solutions to problems, and above all, provided the necessary level of information and support so as to maximize the ability to take responsibility for learning (Mayer, 1996). The instructor served as a mediating context, or a translation medium between the discourses of the methods course and the discourses of the tutoring work. Mediation was delivered at the point of students' need, when they initiated their needs for assistance. In concert, the instructor must contour the support so that students get just enough information to make their own decisions about their tutoring instruction. Serving as a mediator, the instructor must work to scaffold the students through the process of internalizing the skills within their own conceptual frameworks. This scaffolding through assistance might guide students to reflect on their observations, interpret the observations, propose actions, analyze the potential of the proposal, and then design a course of action.

Usually, this more knowledgeable other in schooling contexts is the teacher. But expertise also resides in peers (Resnick, Levine, & Teasley, 1991). Pre-service teachers in the SL context were provided more opportunities to enhance their learning through interaction with peers.

It helped all the while being surrounded by your peers and instructors to aid you if you get stumped (Written reflection, SL#22, 11–15).

We have the benefit of instructors readily available to assist, before, during, and after each session, as well as the ability to discuss, seek advice from and vent with peers facing similar

challenges to ours (Written reflection, SL#14, 11–15).

A benefit is that I am not in this alone. I not only have the instructors available, but I also have my peers who have had similar or different experiences that I am learning from (Written reflection, SL#29, 11–15).

3.5.2. *Interactions promote contexts for learning*

In essence, the SL context was a learning environment that could be described as a "community of practice" (Lave, 1988; Wenger, 1999); a social context in which learners collaborate on knowledge construction supporting and learning from one another, as well as from the physical environment (Kerka, 1997). In using the term "community", the implication is for a unifying or joint pursuit. In the SL context, it was the unifying experience that provided a sense of refuge.

I am seeing the joint effort of everybody coming together and working along side each other to help one another as being a great benefit. The over-all atmosphere of this class has made me (and I believe, everyone else as well) feel safe to try new strategies and to turn to one another as well as our instructor for support and answers (Written reflection, SL#17, 10–25).

This sense of safety fostered the openness and security that led to learners sharing their insights and perspectives. In sharing so that others' may improve their practice, learners must actively reflect on their learning. Reflection entails the process of constructing knowledge at the point of need in order to present it to someone else to understand and use. Within the SL context, this process was facilitated by the fact the reflection immediately followed the tutoring sessions. This immediacy benefited the quality of discussions, for as one SL pre-service teacher described (SL group discussion, 10–25), "It helps me talk about it while it's fresh in my mind. Otherwise, I might forget some of the details if someone asks me a question".

The IND class also made space for reflection time, but a week could have elapsed since the session was conducted. Written reflections also would have provided a reminder of the general activities, but some details may have been forgotten. Plus, over a period of time, self-reflection may have allowed for the student to work through the problem on their own; therefore, not providing a "real" or needs-based opportunity for the others to

learn from the initial inquiry, at the point of need. Further, a process of isolated reflection may have prompted the process of reflection to end with the single episode of initial reflection. Reflecting immediately after the session provided an opportunity for students to receive immediate feedback on their progress and quality of learning. This time of reflection was important in the process of student ownership of learning by actively moving it from the social to the internal plane. This active processing of information appears to have promoted the internalization of that information.

3.5.3. *Internalizing knowledge*

As mentioned, the group reflection provided one mechanism for students to receive feedback on their learning process. However, the overall course assessment provided another mechanism for this feedback. In the IND context, assessment was based on artifacts of the tutoring sessions and occurred at the end of the course. In contrast, the SL assessment was embedded in the tutoring sessions and the debriefings that followed. As Wiggins and McTighe (1998) point out, if a concept is to be understood deeply by students, then the assessment should be as contextualized and project-oriented, as the learning activities. The embedded nature of the SL course allowed for direct observation of the pre-service teachers' performance in actual situations. The SL context provided immediate feedback that facilitated the students' self-assessment and provided another opportunity to internalize the concepts taught.

In a sense, this self-assessment is the qualitative marker that denoted the transformation the students experienced in taking knowledge from the interpersonal plane and connecting it to their own knowledge. The processes that self-assessment requires forces learners to evaluate whether they have learned what they intended to learn, as well as evaluate the quality of that learning. During a written reflection, an SL pre-service teacher pondered the previous group discussion.

I think I made a mistake when I was trying to get him [tutee] to draw a picture that represented the entire book. This week I want to try and read to him without letting him see the pictures in the book, and have him draw what he sees. That seemed to be a successful approach for some other students in the class (Written reflection, SL#17, 11–8).

In this example, the learner is evaluating the effectiveness of her learning a particular comprehension strategy, and in that process, she must reflect on how that strategy was initially presented, how she appropriated the strategy, the effectiveness of how it was utilized, and whether further learning is needed and how that learning might be realized.

Evolution can be defined as a process that selects productive changes that favor a particular organism's propagation. In this case, evolution is deployed as a metaphor for the process by which pre-service teachers' ownership over academic knowledge acquisition was enhanced by the choices they made. Through structures embedded within the context of the learning environment, the pre-service teachers gradually gained control over their learning process. As with selection in evolutionary theory, pre-service teachers' selection must occur in social contexts that have real consequences for particular choices. Otherwise, the choices made, understood as "teaching strategies" through reflection, will not have an impact that causes learning on the part of the pre-service teacher. Traditional teacher education programs typically lack the social consequences—and to a lesser degree, reflection to turn knowledge into practice. Likewise, missing for in-service teachers is the space and opportunity to reflect and make practice reflexive and inform pedagogy. Through interactions with peers, with the instructor, and with the students being tutored, knowledge was presented and negotiated on a social or interpersonal level in the SL context. Facilitated by this interaction, the pre-service teachers moved the information presented to an internal or intrapersonal level, as marked by self-assessment of appropriated knowledge. The following description of metacognitive thinking best summarizes this process of evolution.

When I first started, I knew some of the topics in theory only. With this service, I got the chance to learn them, see how it works, get feedback with the teacher, and tweak anything that did not seem to work, or that just needed a little adjustment (Written reflection, SL#22, 11–15).

4. Conclusion

4.1. *Goals revisited*

In this study, SL has its greatest influence over student learning through its power to promote

student ownership of their learning. As noted, this ownership is a process, which develops over time and appears to emanate from structures promoting student responsibility, voice, power, and autonomy (Dudley-Marling & Searle, 1995). For the pre-service teachers participating in this SL experience, this process began with student responsibility, which was enhanced by the value they placed on the service. This value was related to the meaning and relevance students saw in the service as it related to their learning, that is, the authenticity of the service, its grounding in course content, and the intended consequences of providing the service. As one SL student synthesized several students' comments during the final group reflection,

It allows students to develop a sense of empathy and understanding in their education, rather than view their education as a means to an end. Many students get caught up in simply wanting to complete the “program” for the purpose of obtaining a degree, becoming certified, and getting a job. An experience such as this [service-learning] causes us to pause a moment and remember what matters—the children we touch (SL group discussion, 11–15).

Within this particular context of implementation, that is, an embedded context, several features figured prominently in promoting the development of student ownership of the learning process. Most notably was the “community of learners” that was created. This model provided opportunities for students to interact with their peers during the service, which appears to have facilitated the power of the service to function as a learning opportunity. The presence of the instructor during the service assisted students in connecting course content to the service being provided through immediate feedback and support, which appears to have facilitated the learning that occurred during the service. Feedback during group reflection was noted as beneficial; however, it was the immediacy of the feedback that appears to have been most valuable in promoting self-assessment and ownership of the learning process.

These particular practices, taken singly are not unusual in teacher education contexts. Students in the IND condition did demonstrate a positive gain

in their acquisition of content. That is, traditional tutoring experiences do augment traditional methods classroom practices. However, the gain for the IND group was not so great as that for the SL group. Further, the sense of self-efficacy for the SL group was powerful. It is their combination in this project that created a powerful synergy. These synergistic structures provided the framework through which the bi-directional transformation between service and learning was enacted. Through active participation, facilitated by the aforementioned structures, the SL pre-service teachers were able to shape the context and nature of the service being provided. Students voiced their needs, and their power was made visible as the service experience was transformed to meet those needs. Consequently, the transformations made to the service guided the transformations to the course content. In essence, this reflexive transformation process could be viewed as the linchpin for the evolution of the students' ownership of the learning process; for, evolution fundamentally depends on adaptations to bring about advantageous changes.

4.2. Implications to the field

The intent of this study is not to promote a specific SL model to be adopted, and subsequently reproduced as a prototype. As Wilson (1996) notes, an environment that is good for learning cannot be fully prepackaged and defined. Rather, the intent was to provide a framework for designing SL experiences, which can be adopted and adapted to create similar positive experiences within local contexts of enactment. Successful SL programs should recognize and respond to specific contexts and adapt the model to fit those particular contextual needs (Furco & Ammon, 2001). In this case, the SL pre-service teachers' recognition of the literacy needs of the children changed the needs for particular instructional strategies, structures, and tools. In turn, these needs changed the direction of the course content and the structure of the tutoring experience. The embedded nature of this SL experience facilitated the negotiation of these adaptations between the SL pre-service teachers, the instructor, and the community center coordinator. It is through such adaptations that SL experiences may hold the most potential to serve all who are involved.

Appendix A. Self-assessment of proficiency in reading diagnosis

Directions: Rate your level of proficiency in performing each of the behaviors listed below by circling the number to the right that best describes you. If you do not know what the behavior is describing, circle the number to the left of the behavior. The value of this assessment lies in your honest appraisal of your abilities. Assessing your skills honestly will help you identify the areas in which you should concentrate during the course. Review this form again after you have finished this course to determine your level of progress.

Behaviors	Limited skill		Some skill	Strong skill	
1. Conduct systematic observations of students.	1	2	3	4	5
2. Interview children, parents, and/or teachers.	1	2	3	4	5
3. Administer and interpret the concepts about print test.	1	2	3	4	5
4. Read and follow directions in test manuals.	1	2	3	4	5
5. Interpret standardized reading-test.	1	2	3	4	5
6. Administer a standardized reading test.	1	2	3	4	5
7. Develop questions on different levels of comprehension.	1	2	3	4	5
8. Informally assess a child's reading comprehension abilities.	1	2	3	4	5
9. Informally assess a child's word-analysis skills and strategies.	1	2	3	4	5
10. Administer an informal reading inventory (IRI).	1	2	3	4	5
11. Determine students' reading levels based on IRI results.	1	2	3	4	5
12. Record a student's oral reading miscues.	1	2	3	4	5
13. Analyze a student's oral reading miscues.	1	2	3	4	5
14. Administer a running record.	1	2	3	4	5
15. Interpret a close test.	1	2	3	4	5
16. Synthesize test data and form conclusions.	1	2	3	4	5
17. Write a summary diagnostic report.	1	2	3	4	5
18. Determine in a student is in need of corrective instruction.	1	2	3	4	5
19. Group students for instruction based on test data.	1	2	3	4	5
20. Assess a student's content reading abilities (science, math, social studies, etc.).	1	2	3	4	5

Marintti, A. S., & Homan, S. P. (2001). *Linking reading assessment to instruction. An application worktext for elementary classroom teachers*. Mahwah, NJ: Lawrence Erlbaum.

Appendix B. Reading content test

Name: _____ Date: _____

- (1) Which of the following are social aspects of reading comprehension and response?
- Knowing the strategies used during reading
 - Knowledge about how different language forms are structured
 - Knowledge of word order rules
 - The context you establish for reading in your classroom
- (2) Scaffolding instruction refers to:
- How you organize your beliefs about reading instruction
 - A type of literature program
 - Providing temporary support to students
 - None of the above

- (3) What is Metacognitive Knowledge?
- (a) Knowledge about the strategies used during reading
 - (b) Knowledge about how different language forms are structured
 - (c) Knowledge of word order rules
 - (d) Knowledge of word meanings
- (4) Decoding Instruction:
- (a) Helps students to recognize the meanings of words
 - (b) Helps students determined the oral equivalents of words so that they can then access meaning
 - (c) Is an important inferential skill
 - (d) Helps students learn the correct usage of words
- (5) When helping children to recognize words like colonel, one should probably use:
- (a) A sight word method
 - (b) Inductive phonics
 - (c) Deductive phonics
 - (d) Analytic phonics
- (6) Which of the following is a goal of emergent literacy programs?
- (a) Motivate children about literacy
 - (b) Help children understand what reading is
 - (c) Help children to know the names of the letters
 - (d) All of the above
- (7) A think aloud procedure is most useful for
- (a) Thinking through a complex problem
 - (b) Illustrating critical thinking skills
 - (c) Writing activities
 - (d) Modeling reading processes
- (8) Which of the following is usually not a step in a read-aloud session?
- (a) Choose a book
 - (b) Proofread the book
 - (c) Practice reading the book
 - (d) Read the book aloud
- (9) Literature discussion groups are most often used to:
- (a) Support the development of decoding knowledge
 - (b) Develop emergent literacy
 - (c) Develop knowledge of narrative discourse structure
 - (d) Encourage a wider pattern of response to literature
- (10) Writing is important to consider in a literacy program because writing:
- (a) Develops vocabulary knowledge
 - (b) Develops syntactic knowledge
 - (c) Helps children enjoy literacy experiences
 - (d) Develops all aspects of the comprehension and response processes

- (11) Editing takes place late in the writing process because:
- (a) We want students to correct many of their mistakes earlier
 - (b) We want to develop a sense of audience first
 - (c) We want students to first attend to the content of their writing
 - (d) It is hard to do
- (12) Writing experiences are most appropriate when they:
- (a) Take place after reading
 - (b) Require students to create complete, extended texts
 - (c) Take place before reading
 - (d) Use invented spelling
- (13) Which type of response journal has teachers writing back to each of their students?
- (a) Reader response journals
 - (b) Dialogue journals
 - (c) Buddy journals
 - (d) Write-back journals
- (14) Function words should probably not be taught:
- (a) To primary grade students
 - (b) In a holistic fashion
 - (c) In context in isolation
- (15) Examples are useful during vocabulary instruction because they:
- (a) Provide useful practice opportunities
 - (b) Clarify the distinguishing features behind related concepts
 - (c) Motivate students
 - (d) None of the above
- (16) Schema theory suggests that:
- (a) Concept webs are useful for developing vocabulary
 - (b) Thematic units are useful for developing vocabulary
 - (c) Synonyms and analogies are useful for developing vocabulary
 - (d) All of the above are true
- (17) During Reciprocal Questioning:
- (a) Text-connecting inferences seldom occur
 - (b) Teachers and students question each other
 - (c) Teachers read aloud
 - (d) Slot-filling inferences seldom occur
- (18) In response to higher level questions, you will need to:
- (a) Allow greater variation in responses
 - (b) Check more frequently in the text
 - (c) Ask more children
 - (d) Check in your notes for the correct answer

- (19) Reciprocal questioning and reciprocal teaching are intended to mainly help students develop:
- Metacognitive knowledge
 - Decoding knowledge
 - Vocabulary knowledge
 - Text-connecting inferences
- (20) The procedural steps of a DRA may be used when:
- Teaching a chapter in a social studies text
 - Teaching a lesson in a published reading program
 - Teaching a chapter in a science text
 - All of the above
- (21) Study guides are usually:
- Written in a workbook
 - Written by students
 - Written at three levels
 - Used to develop syntactic knowledge
- (22) Semantic maps may be:
- Used as a pre-reading activity
 - Used as a note-taking activity
 - Used in a guided discussion following reading
 - All of the above
- (23) Advance organizers may be used to:
- Set up expectations
 - Build background knowledge
 - Clarify concepts
 - All of the above
- (24) K-W-L stands for:
- Knowledge, wonder, link
 - Keep, wait, learn
 - Know, write, learn
 - Know, want to know, learn
- (25) A DRA contains the following procedural steps in this order:
- Preparation, guided reading, skill development and practice, and enrichment
 - Vocabulary instruction, silent reading, oral reading, and discussion
 - Preparation, oral reading, skill development, and enrichment
 - Preparation, skill development and practice, guided reading, journal writing
- (26) Jigsaw and Jigsaw II grouping:
- Is used mainly with science texts
 - Is used mainly with social studies texts
 - Is used mainly with math texts
 - Encourages active participation in cooperative learning groups

- (27) A running record:
- Measures comprehension
 - Measures reader response
 - Provides an indication of oral reading strategies
 - Is more complex than an IRI
- (28) Readability formulas do not:
- Consider word complexity
 - Consider sentence length
 - Consider background knowledge
 - Consider sentence complexity
- (29) The main focus of a running record is:
- Comprehension
 - Oral reading behavior
 - Affect
 - Literature knowledge
- (30) Four types of individual differences in reading make an important difference in reading They are:
- Background knowledge, reading interests, reading achievement levels, and parental background
 - Reading skills, reading interests, reading achievement levels, and stained score
 - Reading skills, reading interests, reading achievement level, and visual discrimination
 - Background knowledge, reading interests, reading achievement level, and reading skills

Appendix C. Reflection questions

- Describe what you found beneficial about your tutoring experiences.
- In what ways was this tutoring experience meaningful to you as a prospective educator?
- Describe how the tutoring experiences assisted you in course content and academic performance. Specifically, think about the various areas covered in this course: Assessment, Analysis of Assessments, and Instruction.

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