Investigation of Learning Contracts in Pharmaceutical Education

Patrick Hardigan

School of Pharmacy, University of Wyoming, P.O. Box 3375, Laramie WY 82071-3375

This study explored the outcomes of using learning contracts in an undergraduate pharmacy patient counseling course. Sixty-one students who participated in the 1993 and 1994 core course were surveyed for data concerning: (i) their preferences and evaluations of contract grading, and (ii) their predisposition toward learning self-directedness. Statistical evaluations determined that most students were highly inclined towards learning self-directedness, found learning contracts to be very clear on grading expectations, found that contract grading facilitated the learning process, and found that contract grading reduced anxiety and competition in the classroom. Despite the overwhelming support for contract grading in a pharmacy communication course, most pharmacy students would not recommend using them in all of their professional courses.

INTRODUCTION

The evaluation of students has been and remains one of the primary bases upon which educational systems are judged (1). In the past, evaluation has taken the form of grades, either a letter grade or some variation thereof, which is mandated by teacher-directed criteria. This teacher-directed approach presents an interesting dilemma. More often than not, the grade in and of itself, will become the goal of the course. In fact, what occurs in many situations is the grading system actually becomes a barrier to effective learning.

In an effort to correct this problem a unique and highly effective learning tool has been developed—the learning contract. Developed by Malcolm Knowles, contract grading finds its roots in self-directed learning. Self-directed learning is defined by Caffarella and O'Donnell (1989) as a form of study in which learners have the primary responsibility for planning, carrying out, and evaluating their own learning experiences (2). Allan Tough (1967) provided the first comprehensive description of self-directed learning as a form of study in 1967 (2-4,18). Contract grading attempts to reduce the emphasis on the actual grade by stressing the student's study in 1967 (2-4,18). Contract grading attempts to reduce the emphasis on the actual grade by stressing the student's study experiences (2). Allan Tough (1967) provided the first comprehensive description of self-directed learning as a form of study in 1967 (2-4,18). Contract grading attempts to reduce the emphasis on the actual grade by stressing the student's study experiences (2). Allan Tough (1967) provided the first comprehensive description of self-directed learning as a form of study in 1967 (2-4,18). Contract grading attempts to reduce the emphasis on the actual grade by stressing the student's study experiences (2).

In traditional education, learning activities are structured by the teacher and the institution. The learners are told what objectives they are to work toward, what resources they are to use and how (and when) to use them, and how their accomplishment of the objectives will be evaluated (5,6). This imposed structure conflicts with an adult's deep psychological need to be self-directing and may induce resistance, apathy, or withdrawal (5,6). Learning contracts help to reduce the conflicts which invariably occur in teacher-directed courses. Table I lists reasons in support of contract grading.

Key to the success of learning contracts is an understanding of two basic ideas. First, when adult students enter into a learning environment they bring with them unique self-images, experiences and goals. Second, these characteristics are applicable to all age groups. For instance, such attributes as unique self-image are identified with people as young as fourteen (or younger); the key is maturity level. As a result, using learning contracts can be applied with freshmen college students. The fundamental purpose of learning contracts is to empower the adult learner in the learning process. In order to effectively perform this function one must acknowledge the differences between adult and children's learning styles. Table II provides the adult learning characteristics most often identified in the literature. In reference to these characteristics, the key point to remember is that unless the learner feels the need to learn, and unless there is a relationship between subject matter and the learner's goals, little learning will occur.

Over the last ten years, contract grading has begun to gain acceptance in more learning environments (3-20,23). For instance, learning contracts have started to appear quite frequently in formal higher education; both nationally and internationally. In post-secondary education they have been used to negotiate course content, learning objectives, grading criteria and in some cases they have even been used to specify a student's graduation requirements. Table III offers additional examples.

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In the health care arena, nursing schools appear to have embraced the concept of contract grading most readily (12,14,17). For instance, contract grading has been used in the classroom and in clinical education to help train future nurses (16,17). Further, in an effort to combat patient

Table I. Objectives of a learning contract

<table>
<thead>
<tr>
<th>Objective</th>
<th>Description</th>
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<tr>
<td>1.</td>
<td>Learning contracts provide a means for negotiating a reconciliation between the external needs and expectations of the teacher and institution, and the learner's internal needs and interests.</td>
</tr>
<tr>
<td>2.</td>
<td>Learning contracts provide a vehicle for making the planning of learning experiences a mutual undertaking between a learner and his or her helper, mentor, teacher, and, often, peers.</td>
</tr>
<tr>
<td>3.</td>
<td>The learning contract is a means for making the learning objectives clear and explicit for both the learner and the teacher.</td>
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</tbody>
</table>

*Reference 5, p. 29.
Table II. Adult learning characteristics

1. Adults tend to prefer learning experiences which actively involve the problems they encounter in everyday life.
2. Adults tend to withdraw from learning environments that are destructive to their self-concept.
3. Adults possess a large variety of learning styles.
4. Adults possess a large reservoir of life experiences which they tend to utilize in learning situations.
5. Adults have competing demands on their time and thought processes.

*Reference 6, p. 46.

Table III. Application examples of learning contracts

1. At New College (Alabama) and Ottawa University (Kansas) learning contracts are used to specify the overall graduation requirements.
2. At Minnesota Metropolitan State College and at Empire State College learning contracts provide structure over time for individualized academic work for each student.
3. At Karolinska Institutet, Stockholm, Sweden (medical school) and Medizinische Fakultät Witten/Herdecke, Germany (medical school), students are asked to negotiate the objectives and course content for each class.

Where learning contracts have been applied, most participants (teachers and students) overwhelmingly approve of the process. At the University of North Carolina, Chapel Hill, students enrolled in the radiology program all gave contract grading high marks(17).

In a survey at Mohawk-McMaster University, educators (90 percent) found the learning contract to be a useful evaluation and learning tool(17). Furthermore, students at the University discovered the learning contract to be very helpful in developing learning objectives, learning strategies, finding learning resources, and developing criteria for evaluation(17). The only negative comments arose out of initial frustration with the learning tool.

Little empirical data exists concerning the evaluation of learning contracts in pharmacy education. As the only previously published study Berger and Felkey (1987) found that contract grading seemed to improve both performance and evaluation in the communication course. However, little information exists concerning students’ evaluation of the effectiveness of contract grading towards developing learning objectives and learning strategies, finding learning resources and developing criteria for evaluation.

From all indications the use of contract grading in the health care field is more than just a new gimmick or fad. Many disciplines, from nursing to pharmacy, have begun to acknowledge the problems associated with traditional methods of grading(1-23). Learning contracts have begun to show promise as alternatives to traditional teaching techniques(1-23).

This paper examines the question of contract grading in pharmacy education. While learning contracts have been used with some regularity in other health care educational environments, they have largely been ignored in pharmaceutical education(7). This is in spite of the fact that when students have been asked, they have given very favorable ratings to contract grading(1,7,2,16,17).

METHODS

The basis for this study was to determine if pharmacy students view contract grading as an effective learning tool. As stated earlier, little empirical data exists which would support or negate the use of learning contracts in pharmacy education. The only published study on the subject used teacher evaluations as the basis for their inquiry(7). This study’s findings concluded that students’ perceptions of the instructor improved, as did students’ performance in the class(7). While a causal relationship can be made between increased performance in the classroom and the general purpose of the learning contract, the study does not address the relevant issue of why. The reason is that the study did not ask the students if learning contracts did indeed perform the intended function; empower the learner in the learning process.

Hypothesis

Based on the idea that learning contracts, as opposed to traditional methods of grading: (i) provide a means for negotiating a reconciliation between the external needs and expectations of the teacher and institution, and the learner’s own needs and interests; (ii) provide a vehicle for making the planning of learning experiences a mutual undertaking between the learner and teacher; (iii) provide a means for making the learning objectives clear and explicit for both the learner and the teacher; the following hypotheses were investigated. Compared to traditional methods of grading:

(H1) contract grading makes clear to students what they must do to achieve each grade level;
(H2) contract grading involves the student’s experiences in the learning process;
(H3) contract grading is a more equitable method of grading;
(H4) contract grading facilitates the learning process;
(H5) contract grading requires students to make use of a wider variety of resources.

Subjects

Subjects of the study were enrolled in a required pharmacy communications course (Patient/Professional Interactions—PHCY 3610) at the University of Wyoming during the 1993 and 1994 spring semesters. The goal of the course was to provide pharmacy students with the skills necessary to communicate effectively with patients and other health professionals.

At the end of the course an anonymous attitudinal questionnaire was given to the students. Sixty-one subjects (19 male and 42 female) returned valid questionnaires: twenty-eight from the Spring, 1993. class and thirty-three...
from the Spring, 1994, class. The mean age of the subjects was 25 and seven of the respondents had used learning contracts before. Class standing showed all subjects were senior I’s (second professional year in pharmacy, fourth collegiate year).

Instruments

Two instruments were used to solicit information from the subjects: a five-point Likert scale and a seven-point Thurstone scale. Both were developed to assess three general categories:

1. Function of the learning contract—did it perform the function it was intended to: (i) facilitate learning; (ii) involve experiences: and (iii) make use of a wide variety of resources.
2. Students evaluation of the learning contract—(i) was the learning contract fair; (ii) was the learning contract a useful learning tool; and (iii) was the learning contract clear.
3. Students evaluation of the contract grading process—would students prefer to use learning contracts in all their courses.

Both instruments were tested for their reliability and validity. Four professionally ranked faculty knowledgeable about contract grading were asked to assess the instruments as to their wording, relevance of the questions to the issue of contract grading, and relevance of the instrument’s content to the research question. Internal consistency of the Likert scale was also measured using Chronbach’s alpha. From the aforementioned process five questions, both on the Likert and Thurstone scales, were eliminated.

Statistical Analysis

Item analysis was performed on the Likert questionnaire. The total score for each person, a mean and standard deviation for each item, and the item-total correlation for each question was calculated. Correlations of gender and age with total scores were also performed; however, both correlations proved to be insignificant.

Item analysis was also performed on the Thurstone questionnaire. Mean and standard deviation values were computed. A correlation statistic was run between the Likert scale and the Thurstone scale. A significant relationship was found between the two scales (significant at the 0.01 level). See Table IV.

A student’s t-test was run for the Likert and Thurstone scales to ascertain differences between the 1993 and 1994 respondents. No significant differences were found for either scale based on respondent’s enrollment year in course.

** - Significant at 0.01 level (2-tailed)
* (Significant) relationships are signified by **.

**Table IV. Correlation scores between variables**

<table>
<thead>
<tr>
<th></th>
<th>AGE</th>
<th>GENDER</th>
<th>THURSTONE</th>
<th>LIKERT</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE</td>
<td>1.0000</td>
<td>-0.1337</td>
<td>-0.0588</td>
<td>-0.1568</td>
</tr>
<tr>
<td>GENDER</td>
<td>-0.1337</td>
<td>1.0000</td>
<td>0.2351</td>
<td>0.2268</td>
</tr>
<tr>
<td>THURSTONE</td>
<td>-0.0588</td>
<td>0.2351</td>
<td>1.0000</td>
<td>0.7666*</td>
</tr>
<tr>
<td>LIKERT</td>
<td>-0.1568</td>
<td>0.2268</td>
<td>0.7666**</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

**Table V. Likert Scale—mean responses and standard deviations for specific questions: All groups combined**

<table>
<thead>
<tr>
<th>Question #</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.53</td>
<td>0.50</td>
</tr>
<tr>
<td>2</td>
<td>1.42</td>
<td>0.07</td>
</tr>
<tr>
<td>3</td>
<td>3.44</td>
<td>0.90</td>
</tr>
<tr>
<td>4</td>
<td>3.61</td>
<td>0.63</td>
</tr>
<tr>
<td>5</td>
<td>3.78</td>
<td>0.98</td>
</tr>
<tr>
<td>6</td>
<td>2.23</td>
<td>0.99</td>
</tr>
<tr>
<td>7</td>
<td>4.24</td>
<td>0.62</td>
</tr>
<tr>
<td>8</td>
<td>2.24</td>
<td>0.87</td>
</tr>
<tr>
<td>9</td>
<td>2.62</td>
<td>1.16</td>
</tr>
<tr>
<td>10</td>
<td>2.13</td>
<td>0.87</td>
</tr>
<tr>
<td>11</td>
<td>2.81</td>
<td>0.83</td>
</tr>
<tr>
<td>12</td>
<td>1.21</td>
<td>0.62</td>
</tr>
<tr>
<td>13</td>
<td>3.63</td>
<td>0.92</td>
</tr>
</tbody>
</table>

5=Strongly Agree, 3=Neutral and 1=Strongly Disagree.

RESULTS

The Likert’s scales mean total for both classes was 47.37. The minimum value was 34 and the maximum was 62; the highest possible rating on the instrument is 65 and the lowest is 13. The reliability alpha was 92.85 percent. Spring of 1993’s mean response was 48.10 while 1994’s was 46.64. For this scale, the higher the rating, the more favorable attitude towards contract grading. Based on this analysis subjects were very supportive towards contract grading for this course. Concerning specific items on the scale:

a. students overwhelmingly agreed that contract grading, as applied in the communications course, made clear minimal expectations what each student had to do to achieve a specific letter grade.

b. students generally agreed that the learning contract helped them learn from their experiences.

c. students found contract grading, as opposed to traditional methods of grading, to be more equitable.

d. students found contract grading more straightforward than traditional methods of grading.

e. students found that learning contracts facilitated the learning experience.

f. students would want to use contract grading again.

Table V displays the combined mean and standard deviations for each question.

Despite the general support for using learning contracts, a majority of the students stated that they would not want to use contract grading in all of their classes. While the Likert scale did not address the issue of why, one possible reason is that students may not feel learning contracts can be accurately applied in courses with large number of facts to be memorized.
The Thurstone scale had a mean of 4.56 with a standard deviation of 24. The highest score found was a 5.7 and the lowest was 3.56 (the highest possible score is a 7 and the lowest is a 1). The scale measured opinions on a 7-point scale where a ‘1’ signified a critical opinion against contract grading and a ‘7’ signified a high opinion of contract grading. Table VI provides a frequency histogram of the findings.

The 1993 class had a mean response of 4.61 with a standard deviation of 0.54. The highest score was 5.58 while the lowest was 0.332. The 1994 class had a mean response rate of 4.59 with a standard deviation of 0.53. The highest score was 5.71 and the lowest was 3.53.

The Thurstone questionnaire substantiated the findings of the Likert questionnaire, both through the high correlation between the two instruments and through the high mean scores. A student’s t-test was run for both scales to determine if significant differences were present between the two classes. No significant differences were found for both scales: Likert scale: t-value = 9, df = 59, P>0.20. Thurstone scale t-value = 1.40, df = 59, P>0.37. All were measured at alpha = 0.05.

DISCUSSION
In 1993, all but one student contracted for an A. All of the students were successful in achieving their contracted grade. The quality of work in the class was extremely high while the number of activities the students were involved in increased from the previous semester.

In 1994 all but two students contracted for an A. Again, all students were successful in achieving their contracted grade. A few modifications were made between the two classes. Namely, the 1994 class was required to write two more papers while taking one fewer test.

Student’s comments received from both classes were very positive. Similar to Berger and Felkey’s findings, many students could not believe that the learning contract could help them achieve their desired grade. The only problem was the initial confusion surrounding the application of the learning contracts. Since the majority of the students had never used a learning contract before, many had a difficult time understanding how to correctly use the learning contract. This problem corroborates earlier studies (1,7,17).

Obstacles all students had with the learning contract included uncertainty of personal learning goals and objectives, and hesitancy to define personal evaluation criteria. However, any obstacles students had were eventually resolved. Nevertheless, a definite pattern became apparent with the two classes. Student’s initial confusion was always followed by discovery and individual growth. This would indicate that the learning contract in the communications course was working as planned.

CONCLUSION
Contract grading was implemented in the communications course as a means to improve the quality of education. Effective communications is not a collection of memorized facts but rather, an adaptation to various stimuli. While students can learn effective ways to communicate, ultimately it is an individual response. Contract grading facilitates this process by empowering students to learn effective communication; each at their own pace and style.

Results of the study tended to substantiate the conclusions from other investigations (7,16). Further, contract grading did meet the goal it was intended to: empower the learner. Nevertheless, there are still certain questions which need to be answered. First, a study needs to be undertaken to determine if, indeed, learning contracts improve classroom performance. Second, most students stated that they would not want to use learning contracts in all of their courses. The reasons behind this statement need to be investigated.

In conclusion, results of this study were very encouraging. Students found the experience to be both meaningful and useful. This is important in pharmacy school where most classes revolve around rote memory and teacher directed instruction. Pharmacy educators need to examine other areas for pertinent educational and evaluative methods. In keeping with the 1984 Argus Commission report to “develop sophisticated, broadly based means to assess in students the acquisition and the ability to use identified knowledge and skills, contract grading will continue to be used in PHCY 3610 (patient/professional interactions) (21-22).

References
(14) Henfil, V. and Waldron, H., “The use of competency statements to


