

Learner Centered Teaching vs Constructivist Learning by Traditional Classroom Teaching: An Experimental Study

Klasik Sınıf Öğreniminde Öğrenci Merkezli Öğrenimin Yapılandırıcı Öğrenim ile Karşılaştırılması: Bir Deneysel Çalışma

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ABSTRACT

Aim: The involvement of trainees has increased in all aspects of teaching and learning sessions as a result of the learner-centered approach. This experimental study sought to find out if there is an effect on learning due to involvement of the trainees in objective development.

Methods: A randomized controlled trial was conducted during the continuous professional development program. The participants included a total of 57 general practitioners including both males and females – they were divided randomly into two groups. One group participated in the development of the learning objectives while the control group did not. The main outcome measures were overall score difference in pre- & post-tests (scale 1–10), and matching and recalling of objectives by general practitioners. The association between difference of scores and motivation was assessed by age, sex, and experience of the general practitioners.

Results: No significant difference ($p>0.05$) was found between those who developed five learning objectives (the experimental group) and those who just followed the predefined objectives by the teacher (the control group) with regards to the mean scores difference as well as the development of objectives and recalling of objectives. The level of motivation had a significant ($p=0.02$) association with high mean scores. No association was found between gender and the mean score ($p>0.05$).

Conclusion: The results suggests that there should be some sessions without binding students with pre-defined objectives to give them a chance to ‘think out of the box’. Nevertheless motivation was found to be more important than any other factor.

Keywords: continuous professional development, inquiry based learning, motivation, general practitioners

ÖZET

Amaç: Öğrenci merkezli yaklaşımın sonucu olarak, eğitim alanlar her türlü öğrenim ve öğretim faaliyetlerine daha fazla dahil olmaktadır. Bu deneysel çalışma, eğitim görenlerin gelişim hedeflerinin belirlenmesinde sürece dahil edilmesinin, öğrenme üzerine etkisi olup olmadığını belirlemek için yapılmıştır.

Yöntemler: Sürekli Mesleki Gelişim Programı boyunca, randomize kontrollü bir çalışma uygulandı. Erkek ve kadınlardan oluşan, rastgele iki gruba bölünen 57 aile hekimi çalışmaya dahil edildi. Deneysel gruba öğrenim hedeflerinin geliştirilmesine katkıda bulundu, kontrol grubu bulunmadı. İlk ve son testlerin (1-10 arasında skorlandı) ortalamaları arasındaki değişiklik, ve katılımcılar tarafından hedeflerin seçilmesi ve hatırlanması değerlendirildi. Skorlar arasındaki farklar ve motivasyon birlikteliği, yaş, cinsiyet, deneyim ile değerlendirildi.

Bulgular: Deneysel grubunun 5 adet hedef geliştirilmesi ve kontrol grubunun daha önceden belirlenmiş hedefleri izlemesi karşılaştırıldığında, hedeflerin geliştirilmesi ve hatırlanması arasındaki ortalama skorlar istatistiksel olarak anlamsızdı ($p>0,05$). Motivasyon düzeyi, yüksek skorlar ile beraber daha yüksek tespit edildi ($p=0,02$). Cinsiyet ve ortalama skorlar arasında bir ilişki tespit edilmedi ($p>0,05$).

Sonuç: Sonuçlar, bazı durumlarda öğrencilerin önceden belirlenmiş hedefler ile bağlanmaması gerektiğini, onlara farklı açıdan düşünme şansı da verilmesi gerektiğini göstermektedir. Motivasyon, diğer tüm faktörlerden daha önemli bulunmuştur.

Anahtar kelimeler: sürekli profesyonel gelişim, araştırma temelli öğrenim, motivasyon, genel pratisyenler

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Introduction

During last two decades the academic world has witnessed tremendous changes in teaching and learning styles, however the basics remain same as proposed by Malcolm Knowles (1,2), the father of andragogy and he proposed five factors involved in adult learning: an independent self-concept and self-directed learning, apply life experiences, learning needs closely related to changing social roles, problem-centered, and application of knowledge and motivated to learn by internal rather than external factors. Knowles used these principles to propose a program for the design, implementation and evaluation of adult learning. Since the development of his theory, Knowles has acknowledged that the principles he outlined did not apply solely to adult education (2). The development of the theory simply illustrates that the designer "should involve learners in as many aspects of their education as possible and in the creation of a climate in which they can most fruitfully learn" (3).

The application of Knowles (1,2) theory is not fully established as yet and the learners are involved in some areas of teaching and learning during any training session (4). Needs assessment usually done with the participants at the beginning of the session and later they are involved in an interactive discussion. One area that is not well developed with the consensus of learners is the pre-defined learning objectives. A learning objective is an outcome statement that captures specifically what knowledge, skills and attitudes the learners should be able to exhibit following instruction (4).

Inquiry-based learning (IBL) (5,6) is the use of learning by questioning as a teaching strategy. This can achieve Malcolm Knowles (1,2) three main teaching and learning principles: an independent self-concept and self-directed learning, apply life experiences, learning needs closely related to changing social roles. IBL or open learning is when there is no prescribed target or result, which the students have to achieve. In many conventional traditional science experiments, students are told what the outcome of an experiment will be, or is expected to be, and the student is simply expected to 'confirm' this (7). In open teaching, on the other hand,

the student is either left to discover for him or herself what the result of the experiment is, or the teacher guides them to the desired learning goal, but without making it explicit what this is. Open teaching is an important but difficult skill for teachers to acquire (8,9).

A common misconception of objectives is that the learners are supposed to learn what the teacher or presenter believes to be important, based on competency-based outcomes. The whole workout depends upon pre-defined learning objectives developed by the teaching faculty. Indeed, creating clear learning objectives serves to connect the content and assessment around learning, gives learners a clear picture of what to expect and what is expected of them. It forms the basis for evaluating the teacher, learner, and curriculum effectiveness. It is believed that adults involved in professional development should not be bound by pre-defined limited objectives and should also be involved in defining the objectives by themselves or it should be an open Inquiry Based learning (IBL) (10).

This experimental study was designed for the general practitioners continuous professional development course. The null hypothesis was that there is no difference in outcome between two groups: those who participate in a teaching group where objectives are defined by the teachers at the beginning and those who participate in another group where objectives are defined by trainees at the end of the session. This study also tried to determine whether outcome is associated with variables like motivation, experience, age or sex.

Methods

Participants and setting

The study was conducted with general practitioners (GPs) at the Postgraduate Centre of Studies of Family & Community Medicine, Ministry of Health- Saudi Arabia during a continuous professional development (CPD) program. The postgraduate center took the lead in designing this course for enhancing knowledge, skills and to change attitude and to develop essential skills of family medicine. The course included seven modules and each module included 3-days teaching relevant to family medicine topics (11). The study consisted of

57 GPs who undertook this CPD course during the 2010-2011 academic year.

The course consisted of several modules and topics related to family medicine. Each topic had a consistent sequence of educational activities: lecture, small group work, practical course, interactive lecture, etc. and the formal assessment of all topics took place on the final day of the course. During the course a "Clinical Audit" topic was selected for this experimental study for several reasons: practical application of learning, can have good practical exercise during session and easy to discuss different steps.

The whole session was conducted in one hour and thirty minutes starting with a warm-up exercise, then a PowerPoint interactive presentation with content sequence of general-to-specific approach, followed by small group work with a practical exercise. At the end, the session was summarized by the trainees and facilitators. Each training session had at least two trained and qualified facilitators; the content and materials were developed with the consensus of all trainers and pre-tested on several occasions with GPs in different settings.

Randomization

A list of participants was prepared and randomized into the two arms (experimental and control) of almost equal numbers. No one knew at the time of randomization that who would be in the experimental group. There were two small-folded green and red color slips of paper available on the table and each participant picked one and after that it was disclosed that green color was for the experimental group (Figure 1). As gender may influence learning behavior and learning efficacy (12) so we tried to have a 1:1 ratio of males to females in the experimental as well as in the control group. At the time of designing the study a list of all the GPs was available and we sent a special invitation to maximum number of female GPs to have more females for equalization of the ratio in the experimental and control groups. No other variables were considered as the bases for randomization.

Experiment

The participants were informed about the experiment and it was explained in a briefing session

before starting the training session. A verbal consent was taken from participants and it was assured to them that this experiment would not affect their final evaluation - the participation rate was 100%. Both groups were supposed to appear in a pre-test before the session and later at the end of session had to take a post-test. In the experimental group the presenter did not show the learning objectives at the beginning and asked the participants to write on a paper five learning objectives relevant the content of topic and according to their need which at the end are going to match these five learning objectives with the other group. The control group did not develop learning objectives however they were asked to recall five learning objectives which were shown to them at the beginning of session. Furthermore, a small questionnaire was used to enquire about the reason for participating in the session for an assessment of motivation.

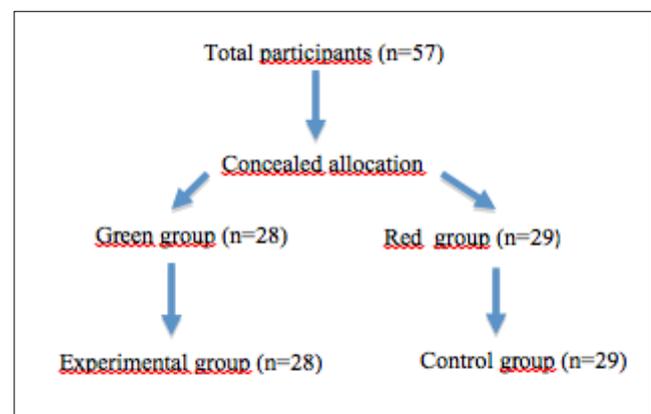


Figure 1. Randomization of the participants

Outcome measures

The main outcome measures were the overall score of the pre- and post-test and their mean difference, which was assessed on the bases of multiple-choice questions scored from 1 to a maximum of 10 points. An inter-group analysis was performed to assess any difference between the experimental and control groups with regards to their mean scores. Age, experience and sex, as well as motivation level were included to determine their effect on the outcome measure.

There are four types of motivation (13): Positive Intrinsic (Motivation towards a goal from insight), Positive Extrinsic (Motivation towards a goal from outside), Negative Intrinsic (Motivation away from a

goal from insight) and Negative Extrinsic (Motivation away from a goal because of external forces) so far demonstrated by the literature. Asking the respondents about why they are attending the course collected this information and their answers were classified according to the abovementioned categories of motivation based on already published literature with valid questionnaire (14,15).

Data Analysis

The data was entered and analyzed using SPSS 18.0. For each attribute, the mean and standard deviation of pre and post-test scores for the two groups i.e. experimental and control were calculated. These were tested using Mann-Whitney-U and Kruskal-Wallis tests for significant differences. A p-value of <0.05 was considered as statistically significant. The relationship between age, experience and mean difference of scores was also determined using the Pearsons correlation coefficient.

Results

The experimental group had 28 participants while the control group had 29 participants. Table 1 shows the comparison of the basic characteristics of the participants.

Table 1. Basic characteristics of the participants

		Experiment group (n=28)		Control group (n=29)	
		n	%	n	%
Sex	Male	14	50%	16	55%
	Female	14	50%	13	45%
Level of motivation	Positive & Intrinsic	16	57%	12	41%
	Positive & Extrinsic	4	14%	6	21%
	Negative & Intrinsic	5	18%	5	17%
	Negative & Extrinsic	3	11%	6	21%
Matching/ Recalling of number of objectives	1	7	25%	7	24%
	2	8	29%	13	45%
	3	9	32%	7	24%
	4	4	14%	2	7%

The male and female ratio was 1:1 in the experimental group and 1.2:1 in the control group. The mean age of the experimental (38.9±5.4 years)

and control (39.4±4.9 years) groups was similar (p=0.72). The mean years of working experience of the experimental group was 9.5±3.8 years whereas the GPs in the control group had 8.6±4 years of experience (p=0.39). Regarding the motivational level, the positive and intrinsic motivation was found in higher percentage in both groups. The experimental group showed 57% and control group showed 41% for the positive and intrinsic motivation style. As far as writing and matching of learning objectives is concerned – in the experimental group 13 (46%) were able to write three or four objectives as defined by the trainers as compared to nine (31%) in the control group (p=0.23).

Table 2 shows that there was no significant difference between the two groups with regards to the mean scores difference among males (p=0.17), females (p=0.22), negative intrinsic motivation (p=0.31), negative extrinsic motivation (p=0.51), positive extrinsic motivation (p=0.84). However positive intrinsic motivation (p=0.02) and matching / recalling one objective (p=0.006) showed higher mean scores in the experimental group.

Table 2. Comparison of mean score difference between the Experimental & Control groups

		Experiment group (n=28)	Control group (n=29)	p-value (Exp vs Control group)
		Mean with 95% CI	Mean with 95% CI	
Sex	Male	2.6	1.6	0.17
	Female	2.3	1.62	0.22
p-value within group		0.43	0.98	
Level of motivation	Positive & Extrinsic	3.0	2.8	0.84
	Positive & Intrinsic	2.8	0.3	0.02*
	Negative & Extrinsic	0.7	1.2	0.51
	Negative & Intrinsic	1.6	0.8	0.31
p-value within group		0.02*	0.02*	
Matching / Recalling objectives	1	1.3	-0.4	0.006*
	2	1.6	1.3	0.41
	More than 2 objectives	3.6	3.7	0.89
p-value within group		0.001*	0.001*	

* Significant difference at p<0.05

Table 2 also shows that the level of motivation had a significant ($p=0.02$) association with high mean scores within the group. Those who had positive & extrinsic motivation scored higher in the post-test in both groups. Similarly those who have written more than two matching learning objectives had a higher mean score difference ($p=0.001$) in both groups. There was no significant difference in the scores with regards to the gender. There was no correlation found between age or experience with the mean scores difference in the two groups.

Discussion

The importance of development of learning objectives is obvious from the literature, but this study does not show a significant difference between the experimental and control groups.

Open learning or IBL is usually applied in different practical settings (16,17), this study is based on the topic of "Clinical Audit" which requires practical work for better understanding. Not defining a pathway in a non-traditional way of teaching has many benefits; for instance, the students do not simply attend the session in a routine manner, but actually think and focus about the content they learn and what it means. Because the path taken to a desired learning target is uncertain, open lessons are more dynamic and less predictable than traditional lessons (9). Another interesting point is that students can be further involved in the learning process by asking them to concentrate on the content of courses and develop objectives. The involvement of students in the learning process has already been proven to be an important role in enhancing learning (2,3). When participants know that they are supposed to develop learning objectives, which would be used as an

outcome measure and would also be part of their assessment, then they try to be more focused during learning session.

The gender, age and working experience did not show any effect of mean score difference between the pre- and post-test scores of both groups. This study showed that the main thing, which makes shows a difference in both the two groups is the motivation level. This has been shown by other studies (13, 18-20), which demonstrated that motivation is an essential part of learning. This study shows that positive extrinsic motivation plays an important role in learning for both the groups. Therefore learners' motivation is useful for all learning activities.

The study design, a prospective randomized controlled trial can be considered to be robust, because selection bias, information bias and confounding bias are highly unlikely. The primary outcome of the study, i.e. the score of the formal examination, is unequivocal. Despite randomization and all attempts to remove biases there are always some other inherited limitations present in learning and teaching sessions. Each subject or learning area has its own characteristic content, special vocabulary and concepts. The type of learners, the competence and strengths of the trainer(s), the ability of the facilitators of learning also has to be taken into consideration when selecting content (21-23).

Conclusion

This study reinforced the IBL and open teaching methodologies, and highlighted a new instructional method to involve learners to develop learning objectives. Furthermore, the study confirmed that the positive intrinsic motivation of participants is important for learning.

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