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Implementation of a Two-Way Feedback (Student-Faculty) During Learning Anatomy

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Implementation of a Two-Way Feedback (Student-Faculty) During Learning Anatomy

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A dissertation submitted in part fulfillment of the degree of MSc in Leadership in Health Professions Education, jointly awarded by the Royal College of Surgeons and University of Sharjah

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I hereby certify that this material that I now submit for assessment for the Project Dissertation and Action Learning Sets module on the MSc in Leadership in Health Professions Education is entirely my own work and has not been submitted as an exercise at this or any other University.

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Finally, I would like to dedicate this dissertation to my small family, Abeer, Ahmed and Rawan. Thank you for being so amazingly supportive, our take home message will be that there is no limit for the continuous education and improvement. We gain strength, and courage, and confidence by each experience we face.

(Mohamed ELadl)
Abstract

Background:

Assessment of learning could promote deep learning, but it does not provide sufficient feedback to drive further learning and training. Although the students are subjected to some formative exams throughout the PBL units, feedback is not given appropriately and timely. We noticed that students want to know and use the reasoning behind judgments and they are always complaining that assessment criteria need to be explained.

Aim of the work:

The aim of this project is to implement a two-way feedback session (TWFS), in which both faculty and students have an opportunity to discuss their reflections on learning and examination processes.

Methods:

An Anatomy formative assessment is introduced to 100 students followed by implementation of TWFS. The faculty members provided the students with a structured and timely feedback on their performance in general and on the formative exam in particular. Also, the students reflected on the whole learning process, including the real examination experience and contents. The researcher used HSE Change model through the project and the reaction was measured using quantitative and qualitative instruments, covering level one of the Kirkpatrick model.

Results:

High satisfaction toward TWFS implementation was obtained. The students and the faculty recommended the implementation of this session in different courses and units.

Conclusion:

TWFS has been implemented and both students and faculty agreed that it enhanced the students’ learning and performance by helping them identify gaps between standard and actual performance. It also helped faculty to adapt teaching to learners needs and to keep up with their progress.
Chapter 1

Introduction
Chapter 1: Introduction to the dissertation

1.1. Introduction

Although formative assessment is a valuable tool for improving student learning, its associated feedback component is critical (Cooper, 2015). In this dissertation, we are aiming to implement an approach for two-way feedback delivery after formative assessment and explore the impacts of providing the students with an early feedback and receiving theirs during their learning. Implementation and analysis of how beneficial is the two-way feedback session (TWFS) for both faculty and students is a particular focus of the project.

In this chapter, the organizational context, background and rationale for carrying out the project are highlighted. The aims and objectives are described, and the role of the researcher in the organization and the project is explained.

1.2. Organizational context

The research place is in the college of medicine in one of the universities in the Gulf region. The university was established in 1997 as a non-profit institution under a governmental sponsorship and Ministry of Higher Education authorization. It includes fourteen colleges providing various levels of degrees including Bachelors, Masters and Ph.D. levels.

The College of Medicine was established in 2004 to produce quality doctors to serve the community. It has differentiated itself with the full spectrum of medical education as one of the leading colleges in introducing innovation in medical education in the Gulf Cooperation Council (GCC) countries. Its vision
stated that the College of Medicine would aim for national and international distinction by distinguishing itself through superiority, in the full spectrum of medical education at the undergraduate, postgraduate and continuing professional development levels. Its mission is to afford education for medical students and medical experts through the production of a scholarly atmosphere that fosters excellence in the lifelong goals of education, research activity and compassionate patient care (Sharjahacae, 2016).

The College of Medicine has approved an integrated, Problem-Based Learning (PBL) curriculum, in addition to the implementation of different strategies of authentic learning like Team-Based Learning (TBL) and Task-Based Learning. The curriculum is spread over six years (Appendix 1) with the first year being Foundation year, with an average of 100 students per batch. The founders of the College of Medicine believed that the curriculum should be dynamic and responsive to students' needs, closing the gap between curriculum on paper, curriculum in action and the learned curriculum (Sharjahacae, 2016).

This research project is conducted during learning anatomy in the pre-clerkship phase for year two medical students.

1.3. Organizational impact

Implementation of a well-planned, needed educational change is crucial and vital for the college of medicine. Introducing two-way feedback during teaching anatomy as an innovation supports college of medicine graduating students’ outcomes that characterized with critical thinking and lifelong learning. It has a positive impact on the college of medicine and the university
as a whole. The university will be capable of meeting learners and community needs and can compete with the other universities. The change will also reflect on stakeholders’ satisfaction regarding the methods of teaching and the quality management, as well as have more competent graduates with up to date knowledge and excellent skills.

1.4. Rationale

The anatomy course as a subject matter is one of the most important and challenging tasks for undergraduate medical students (Stefan et al., 2014). Faculty continually look for new teaching techniques that give the students a more interesting and advantageous experience in the course.

Although assessment of learning could promote deep learning, it does not provide sufficient feedback to drive learning, which may act as a barrier to further training (Schuwirth & van der Vleuten, 2010). The students tend to study what they expect to be tested on and use weighing of assessments as a mean to rank the importance of various parts of the curriculum. The researcher recorded that little care has been given to promoting students' active participation in getting feedback on learning anatomy.

Also, although the students are sometimes subjected to some formative exams during the anatomy course throughout the PBL modules, feedback is not given appropriately and timely to the students. It has been noticed that students want to know (and use) the reasoning behind judgments and they are always complaining that the assessment criteria need to be explained.

Traditionally, feedback was seen as a something presented by the teacher to the student 'as a gift'; with students play the role of passive recipients or
observer (Furey, 2014). Recently, there is a considerable change in the application of feedback and it is proved to be required for both faculty and learners to identify the weaknesses and achieve improvement. Feedback may lead to some significant modifications, revisions or repetitions when indicated for improving teaching and learning. In addition to that, there is an extensive acknowledgement that students should play a more active part, which makes a great difference to the quality of their learning. The course coordinator could provide two-way feedback namely teacher feedback and learner feedback searching for areas of improvement (Siddiqui, 2013).

1.5. Project Description

Implementing a TWFS, after a formative assessment, is the core of this planned change project to enhance an effective and timely feedback process as such a system does not exist.

The first semester for the second year medical students (semester five) is fifteen weeks (Appendix 1). It includes three units; cardiovascular system unit (six weeks), respiratory system unit (four weeks) and endocrine system unit (five weeks). Each unit shows several integrated courses, like Anatomy, Physiology, Biochemistry, Pharmacology and immunology.

A TWFS after a formative assessment is a session that the researcher planned to implement at the end of teaching the anatomy course of the cardiovascular and respiratory units during the tenth week. In this session, both the faculty and the students are expected to have the opportunity to discuss their reflections on the learning and examination processes. The faculty members will provide the students with a structured feedback on their
performances in general and in the formative exam in particular. They will discuss the ideal answers of the formative exam with the students and highlight their common mistakes. They will also supply them with the details of the assessment procedure, starting from the way of selecting the questions and ending by the item analysis of their achievements in the exam. Besides, the students will be able to reflect on the whole learning process, including the real examination experience and contents that they have encountered in the formative assessment.

The researcher assumes that introducing the TWFS after the respiratory unit (in week ten of the semester) will give the students the advantage of having five more weeks before the final exam, so that they can benefit from the feedback provided to them by the faculty. Also, these five weeks will allow the faculty members to make any required modifications in teaching and assessment processes based on the obtained feedback during the session.

An Anatomy formative assessment is introduced to the second year medical students at the end of the respiratory unit, including materials from cardiovascular system and respiratory system units. The formative assessment consists of the two parts; written multiple-choice questions (MCQ) part and Objective Structural Practical Exam (OSPE) part. This formative assessment gives the students a great chance for orientation for not only the exam’s content but also its situation format as well (Evans, 2013).

The TWFS is implemented immediately after the formative assessment. The extent of satisfaction of the students and faculty is identified and analysed by gathering quantitative and qualitative data through a questionnaire and focus group discussions. Interviews with the anatomy faculty members also explore
the impact of that feedback process on the staff. This process informs through analysis; process and behavioural changes that will lead to an improvement in the learning process.

1.6. Aim and objectives

1.6.1. Aim

The aim of this project is to implement an approach for two-way feedback delivery to enhance students’ learning and performance by helping them to determine expected outcomes and identify gaps between these expected and the actual performance. This will also help faculty to adapt teaching to learners needs & to keep up with learners’ progress.

1.6.2. Objectives

The project will be implemented to:

- Design feedback session between students and faculty based on formative assessment.
- Encourage the students to reflect on their learning.
- Measure the students and faculty perception on the feedback process and its impact on the students learning.

1.7. Role of the researcher in the organization and the change process

The researcher is an assistant professor of anatomy and embryology. He is teaching anatomy and embryology to undergraduate medical students and acting as PBL facilitator. He is also the unit chairperson of the cardiovascular, respiratory and many other units for the second year medical students.
Regarding the proposed change, the researcher will share teaching the anatomy course together with his colleagues, as well as introducing the formative assessment at the end of the respiratory system unit. Also, he will introduce a TWFS with the students, providing them with the instructors’ feedback and receiving theirs.

The staff in the basic medical science department will help in the coordination of the formative assessment and TWFS with the students and they will help in getting the feedback from the students. They will assure the participating students that the recorded discussions will be secured and will remain strictly confidential, which will enable the students to state their feelings more freely and honestly.

In the following chapters, the main themes related to the review of literature will be critically discussed in chapter two. They will provide an analysis of the latest literature and further justification for the rationale for the change. In chapter three the appropriate steps for change are structured using the Health Service Executive (HSE) change model will be explored. Chapter four deals with the project evaluation through quantitative and qualitative data collection and analysis. Finally, Chapter Five reassesses the findings from the project.
Chapter 2

Literature Review
Chapter 2: Literature Review

2.1. Introduction

By using educational and academic databases, the review of the literature was conducted for a demonstration of the existing change project. In this chapter, the researcher will critically analyze selected references with its association with the current change project. The researcher will set out the principles behind giving effective feedback after formative assessment, considering different classes and models by which feedback can be given and exploring some of the issues associated with giving feedback to students, trainees and colleagues. He also will explore the impacts of providing effective feedback for both faculty and students.

2.2. Purpose of literature review

This literature review has been conducted to clarify the following exciting areas:

1. What is the formative assessment and explore how it can be used to understand student achievement and improve faculty performance
2. What are the classes and models of providing feedback, and elaborate what are the barriers and challenges associated with giving effective feedback
3. What is the impact of providing an effective feedback on students' learning and performance as well as its impact on faculty

2.3. Search strategy

The literature was gathered from textbooks, web-based databases and journals. The researcher relied on the internet-based search engines
including the RCSI & the UOS libraries online databases, which were set up to be linked to Google Scholar. In addition to Science Direct, Medline, Medline with Free Text and Research Gate. Some or all of the following keywords were searched: “Formative Assessment or Assessment for Learning”, “Anatomy Education or Undergraduate Medical Education” and “Effective Feedback or Formative Feedback". The titles were chosen according to its pertinence to the research, and the abstracts were read painstakingly to explore how far they are corresponding with the gist of the research. Articles that are not peer-reviewed or not published in the English language were excluded. Finally, appropriate articles were distinguished and comprehended in the literature.

2.4. Review themes

Research for explanations for the previously mentioned review of literature inquiries has generated three themes. These include the formative assessment, the effective feedback, and the impact of providing an effective feedback for both students and faculty. Following is a critical discussion of the three themes.

2.4.1. Formative Assessment

Scriven (1967) was the first who introduced the differentiation between the summative and formative forms of assessments. He considered the information provided by the summative assessment judge the overall value of an educational programme and make the final decision of what the learner had achieved at the end of a course or curriculum while these results from the formative assessment target at facilitating programme improvement.
Perhaps the best way to put the formative/summative distinction is due to Robert Stake (2004): when the cook tastes the soup, that’s formative assessment; when the guests taste the soup, that’s summative assessment’. Individual would never assume a cook not to examine his soup before serving it to guests; it would be appalling to the cook if he did not afford himself the opportunity to taste the soup before serving it to a guest. This saying clearly describes the requirement for both formative and summative assessment, and their connections.

The purpose of formative assessment is to provide feedback and correctives at each stage in the teaching-learning process. The term formative indicates that data is collected during curriculum formation or development and so allowing revisions (Brookhart & Nitko, 2015). In education, the purpose of formative assessment is to gain information for programme improvement. The term summative indicates that information is collected at the end of the implementation of the curriculum programme and decisions will be made as a result of this evaluation. Faculty members know if learners accomplished the objectives or whether the programme produced the targeted outcomes (Bloom, 1969; Ruangcharoon, 2012).

Formative assessment by experts is valuable before full-scale implementation of the programme. The experts would evaluate the harmony between the learning activities, materials used, and the learning outcomes, and any mismatching could be modified in the curriculum plan. This experts’ revision may provide useful information for adjusting selected strategies (Ruangcharoon, 2012).
The formative assessment also may involve the learners in the revision of curriculum tools and methods of evaluation of their effectiveness. The feedback obtained from these formative reviews could be used to revise and improve instruction strategies and whether or not it fit the programme before full implementation (Ludvigsen et al., 2015).

Some authors believe that the formative assessment is an instrument or a diagnostic test. Popham (2008) stated that formative assessment is a process but not a test. In this view, the process creates not so much credit as a qualitative awareness into student perception. Such adaptation will typically occur over short cycles, within or between lessons (Morris, 2015).

Although the summative assessment should fulfill its primary purpose of documenting what students know and can do, it should also successfully meet a secondary purpose of support for learning if carefully crafted. There is no doubt that any summative assessment can support learning effectively. It can be a valuable learning experience if the content, format and design of the test offer a sufficiently rich domain representation (Rohrer & Pashler, 2010). Also, taking a test can both improve learning by encouraging the reproduction of information regained during the test and also reduce the rate of misremembering (Shepard 2006; Rohrer & Pashler, 2010).

Well-designed and implemented formative assessment should be able to suggest how instruction should be adjusted, as well as recommend to the teacher what students know and can do. Thus, we should be capable of plan assessment systems in which summative tests, besides fulfilling their primary purposes, routinely boost learning, and formative assessments routinely add to the teacher’s overall informal evaluations of student performance.
Anatomy is one of the oldest basic medical sciences and is considered not only core to medicine, but also to some associated and complementary health disciplines. The first person who introduced the term ‘anatome’ was Aristotle (384-322 BC). It is a Greek word meaning cutting up or taking apart. It was first studied formally in Egypt and was taught in Greece by Hippocrates (460-377 BC) who is considered as the “Father of Medicine” (Ashalatha & Deepa, 2012).

Evaluation of anatomy teaching and learning in the medical programs has been profoundly studied, and assessment is seen as one of the most important drivers of change and innovation in education, as it outlines the aims for both learners and faculty. This is also linked directly to effective teaching and learning by rewarding understanding and achievement of learning outcomes (Shittu et al., 2006; Strkalj et al., 2011).

Azzi, et al. (2014) have used formative assessments to assess and predict students' outcomes on summative examinations. They stated that formative tests helped recognize students at risk of failing the clinical anatomy course. Spandorfer et al. (2014) stated that peer assessment by students in anatomy offers students an opportunity to improve their interpersonal skills and work habits and that the use of peer assessment tool was associated with advances in work practices and interpersonal characteristics, particularly by the cohort of students who received the lowest mid-course feedback.

Abutorabi (2015) concluded that formative assessment along with summative assessment improves the quality of anatomy and histology education, motivation to study, and self-directed learning among students. But
they indicated that it also significantly reduced students’ scores and learning in the anatomy course.

2.4.2. Providing feedback

Feedback lies at the center of teaching, learning and assessment and is considered the base of many important developments in modern health profession education, such as workplace-based assessment, the move towards competency-based curricula, and evaluation and coaching. Feedback assists learners to maximize their potentials in professional development, increase their awareness of intensities and areas for enhancement and identify procedures to be taken to improve performance (McKimm, 2013 and Williamson et al., 2015).

2.4.2.1. Feedback and learning process

Kolb (1984) indicates that experience forms the basis from which learning extends itself which is consistent with stages of human growth and cognition regarding the learning process. He proposed that learning happens in a circular fashion and that learning is experiential (learning by doing) with the ideas being formed and modified through experiences. Four distinct learning phases have been described (Figure 1) from this cycle of experiential learning (Concrete Experience, Reflective Observation, Abstract Conceptualization and Active Experimentation.)
A typical presentation of Kolb’s two dominant learning abilities continuums is that the horizontal axis is called the Processing Continuum (either Reflective Observation, or Active Experimentation; how we approach a task) and the vertical axis is called the Perception Continuum (either Concrete Experience, or Abstract Conceptualization; our emotional reaction, or how we feel or think about it).

Konak et al. (2014) identifies the essential use of feedback in the learning cycle, in supporting reflection and contemplating how theory relates to practice. Faculty and learners can work together to adjust and plan future learning needs and experiences. To help learners accomplish their learning aims, faculty need to start with an understanding of what is the current level learner has reached, what is his/her experience and what is the needs and
goals of this learning regarding knowledge, skills and attitudes. The teacher may need to observe more than one of these learning domains at the same time. He has to be capable of identifying where and how far the learner has progressed towards the learning aims, where he/she may have gone away from the track and what further learning or practice may be required.

2.4.2.2. Informal and formal feedback

Two major classes of feedback have been described; formal feedback, for instance as part of the assessment of learners' performance and Informal, in which there are multiple conversations between different people regarding the performance, behavior, and goals (Harolds, 2013).

A supportive feedback setting is directed more to the informal class of feedback and surpasses the limitations that derail from formal performance feedback (Dahling & O'Malley, 2011) and has been connected with a plenty of encouraging outcomes (Sparr & Sonnentag 2008). Informal feedback occurs as a daily confrontation between faculty and learners, between colleagues or peers through questioning techniques, planning appropriate teaming exercises and building in time for discussion (Hill & Reddy, 2007; Van Waeyenberg et al., 2015).

Providing informal 'on the job' feedback might need only a few minutes to be most efficient; the feedback should be provided at the time of the activity or as soon as possible after, so that those involved could not forget the changes. Informal feedback should start positive and specific, focusing on the learner’s strengths and helping to reinforce desired behavior. The dialogue is maintained moving with open-ended questions, which can be followed up with
more probing questions. Learners should be inspired to be proactive in seeking feedback from others as this is often more timely and relevant to learners' needs (Johnson & Connelly, 2014).

On the other hand, formal assessment is often required based on remarks on learners over a duration of time, for specific purposes (e.g. evaluation, end of course interviews) or as part of continuous assessment. If ongoing feedback has been repeatedly carried out then, formal feedback should not contain any wonders for the learners. It can be given in small groups or on a one-to-one basis. It is important that both the feedback givers and those who are receiving feedback are fully prepared, and the structure for giving feedback is agreed between them (Cherry-Bukowiec et al., 2015).

2.4.2.3. Feedback models

Some different models have been developed for giving feedback in a structured and positive way. A chronological statement of observations is the simplest of these models. Replaying the experiences that happened throughout the session back to the learner can be effective for short feedback sessions, but can become difficult during long sessions (du Boulay & Luckin, 2015).

The best-known approach to feedback is a model formalized by Pendleton and colleagues in the 1980s in the context of consultation skills training in general practice (Pendleton et al., 1984), which ultimately became known as 'Pendleton rule'. This model intended to provide balance and safety to counteract the historical tendency for feedback to focus on negative aspects, often with little or no emotional support, turning it into potentially distinctive
and demotivating process. The aims of the approach are to encourage self-evaluation and, by focusing on positive first, to reinforce strengths and forestall a spiral of defensiveness (Williamson et al., 2015).

Rees et al., (2015) described several models of peer feedback: a collaborative model, an evaluation model, and a developmental model. In the collaborative model, colleagues inspect each other’s teaching and provide feedback. This will enhance self and mutual criticism and advance teaching process. In the evaluation model, the seniors make judgments on the performance of juniors. In the developmental model, expert educators provide feedback based on their observation of juniors and to improve their competencies.

Other models include the ‘feedback sandwich’, which begins and ends with positive feedback, with the perspectives for improvement 'sandwiched' in between (Gabay, 2015).

2.4.2.4. Giving effective feedback

The feedback context is a broad construct and may consist of multiple dimensions. The quality of feedback refers to the consistency or usefulness of the feedback provided (Steelman et al. 2004). High-quality feedback is consistent over time and specific and considered more useful compared with low-quality feedback (Wang et al., 2014).

Regardless it is formal or informal feedback; there are some basic principles that make feedback more effective. Feedback should be provided when asked to do so or when the learner accepts the feedback offer and as soon after the event as possible. The overall focus is on the positive and should be part of the overall communication process and 'developmental dialogue'. To be
effective, it is important to develop harmony, mutual respect and confidence between the teacher and the learner (McKimm, 2013).

Confidentiality is preferred wherever possible especially when giving negative feedback. Being concentrated on the current situation and not bringing up old matters or earlier mistakes, except if this is to highlight a pattern of behaviors but focus on specific behaviors that can be improved, not personality traits, giving examples where possible and do not evaluate or assume motives (Kenyon et al., 2015; McKimm, 2013).

When giving negative feedback, the suggestion of alternatives is essential. The feedback giver should remember that feedback is for the recipient, not the giver, so he has to be sensitive to the impact of his message. Consideration of the content of the message, the process of giving feedback and the congruence between verbal and non-verbal messages is crucial (Iskander, 2015; McKimm, 2013).

2.4.2.5. Barriers of giving effective feedback

Frequently in medical education, a wide range of health professionals are concerned with formal assessments. This can cause anxieties and barriers for both those giving and receiving feedback. Time, emotional aspects and harmful effects on mentor-student relationship were frequently identified within the literature. Wells and McLoughlin (2014) identify some barriers to giving effective feedback in the context of medical education. The student resistance or defensive when receiving criticism is sometimes forming a great barrier. Too generalized feedback and not related to specific facts or observations is also a common barrier. Duffy (2003) had recognized that some mentors
potentially avoid failing a student, claiming practical barriers of time as the reason. However, good mentors who are motivated and well qualified for the task should be able to overcome these possible barriers. Several authors claimed emotional involvement as a potential barrier to feedback and linked the perceived harmful effect on mentor-student relationships that negative feedback can have as a barrier to undertaking feedback (Clynes & Raftery, 2008; Fowler & Wilford, 2015; Woodcock, 2009).

Learners do not sometimes receive feedback positively, and fear of this can inhibit experts giving regular face-to-face feedback. People's responses to criticism vary and learners often discount their ability to take responsibility for their learning. Their responses may present the negative ways, including anger, denial, blaming or rationalization. It is useful to think in a structured way about how feedback might be received and to encourage an open dialogue and receptivity (Johnson & Connelly 2014).

Proper student peer feedback may not occur for several purposes, including social discomfort when identifying a peer's weakness; the associated responsibility; inadequate knowledge; and insufficient training (Gallagher, 2015; Rees et al., 2015).

When peer feedback is not accurate, there is a hazard that significant areas of performance will persist unchanged (Cantillon & Sargeant, 2008; McCune & Rhind, 2014). Also, peer judgemental feedback may result in a deterioration of performance (Cantillon & Sargeant, 2008). Some studies have observed that students receiving peer feedback are afraid of being criticised by their peers (Wen & Tsai, 2006; Gallagher, 2015).
2.4.2.6. Impact of effective feedback

Educational environments are typically associated with uncertainty about how to reach a particular goal, and high-quality feedback provides a sufficient and useful tool to overcome this uncertainty and results in less role ambiguity, increased self-awareness and information to improve performance (Mom et al., 2015; Van Waeyenberg et al., 2015).

Koh (2008) stated that effective feedback could be linked to student self-esteem and motivation. He assumed that faculty hope to motivate the student to want to learn and develop by providing effective feedback, and they should be aware that hiding negative feedback issues could actually hinder the students’ development. Liao et al. (2013) concluded that giving effective feedback should be provided to enhance residents’ learning as a process of quality improvement.

Clynes and Raftery (2008) claimed that without contextualising feedback in practice, students might compare themselves to more senior colleagues, which could have an adverse impact on their self-esteem reinforce the benefits of constructive feedback. Medina et al. (2013) stated that the most effective strategy is to provide specific verbal and written problem-solving feedback to students regarding their performance on team-based learning. Wells and McLoughlin (2014) stated that mentors play a substantial role in delivering competent practitioners into the profession, and constructive feedback sessions play a vital part in this.

Effective feedback also provides the faculty and the administrators with comprehensive data on student performance as a demonstrative mean to
understand areas of student deficiency and to focus their teaching efforts better (Muralidharan & Sundararaman, 2010). Boudet et al. (2005) stated that there is a potential effectiveness of low-stakes examinations include the benefits of greater information in enhancing teaching fashion and increases the intrinsic motivation of teacher by directing attention at student learning levels and improving their ability to set and work towards goals. A useful way to differentiate these two approaches is to believe of low-stakes tests as assessments for learning and high-stakes tests as assessments of learning.

Systems that make the feedback on student performance available for faculty are accompanied by varying levels of training and coaching of faculty on the effects of the feedback for improving teaching practices (Muralidharan & Sundararaman, 2010).

2.5. Summary

Formative assessment is the assessment that should not be mainly intending grading students' knowledge, but aiming for improving learning. The advantage of formative assessment is the opportunity for feedback and while the concept of such low-stakes testing is promising, there is very limited rigorous evidence on its effectiveness. There are benefits and challenges for students and faculty involved in the feedback process. Feedback empowers students to keep abreast of their weaknesses and strengths and help faculty to understand areas of student deficiency and to focus their teaching efforts better, thereby promoting and improving their learning. However, this feedback should be given effectively with basic knowledge of its barriers and how to manage.
Chapter 3

Change Process
Chapter 3: Change Process

3.1. Introduction

For the application of a successful change in an organization, a sufficient readiness for the change should be installed before the implementation process. It is important before initiating change within an organization to distinguish the current situation and what is the targeted position where it needs to be in the future, and furthermore how to control the changes required to get there (Todnem, 2005).

Many authors claimed that low level of readiness led to a failure of change efforts. Also, the absence of change model may lead to the limited success of these reform efforts (O Connor & Fiol, 2006; Leeman et al., 2007). Therefore, it is essential for the projects’ managers or changes agents to adopt an appropriate change theory or model that provides a structure for implementing, managing and evaluating change (Mitchell, 2013).

There are several strategies to change that are reported in the literature; of these are the planned, prescriptive, and contingency approaches. The researcher will discuss each one of them in the next sections.

Introducing a two-way feedback while learning anatomy is the chief concern of this organizational change project. In this chapter, the researcher will present an overview of the methods used as part of the change project. The researcher will explain the different phases through the application of the Health Service Executive (HSE) model of change, which include initiation, planning, implementation and mainstreaming. The justification for considering this particular change model will also be presented.
3.2. Action Research

Action research; also known as Participatory Action Research (PAR) is perceived as a research method joined with emancipatory practice, which is essential for building sustainable educational settings. It offers the opportunity for combining social research and social action and provides the improvements in education, science and society (Davis, 2010).

Kurt Lewin developed the action research methodology in the late 1940s and defined it as a problem-solving technique (Barnett, 2016). It is, as the name implies, a research method with double purposes of action and research (Dick, 2002). Change is not only a privilege of the research process; it is integral to it and follows continuously. It starts with a meditation on current activities, including what is missing, and advances to new actions that are investigated which results in a continuous spiral with each cycle leading smoothly and unavoidably to the next (Figure 2). Therefore, it is ongoing and constituted by a flow of related events over time and not a linear research procedure (Davis, 2010).

![Figure 2: Action Research Cycle. From Rossouw (2009)]
Within the sample of explanatory theory, action research is used as a kind of investigation that empowers classroom educators to investigate matters of interest critically in the setting of their classrooms in a trial to improve their practice (Rossouw, 2009).

A “culture of sustainability” is the desired result of the action research in an educational environment, which brings sustainability thinking and traditions into all phases of its teaching, services, atmosphere and connections. This is where sustainability practices and habits between all those involved become part of every-day routines, learning and relationships (Davis, 2010).

3.3. Organizational Change

Change is an inevitable element in all organizations and so, businesses must adapt and respond to new challenges so that they continue to grow and cope with external factors (Winceket al., 2015). Learning, education, and training could and should focus and act on the learning quality improvement for learners by learning innovation to fit the tremendous and exciting changes in civilizations and its influence on citizens, businesses, and countries (Stracke and Shamarina-Heidenreich, 2015). Modern educators are working in a rapidly changing environment, which brings privileges to students, faculty as well as educational institutions. Change in the educational landscape results in a continuous increase in the leadership and management responsibilities of educators (Lee and Lee, 2015).

Change is needed due to an obligation or as a reaction to difficulties and regardless the demand for change, there must be an intrinsic passion and vision for change (Bell, 2015). Kotter (2012) referred to this as creating a
sense of urgency. He contends that change should have a structured approach that requires time, preparation and various phases. Regardless of how well planned organizational change is the success of the project may be hindered if the culture is disregarded (Werkman, 2009). Culture is an essential element in every organization as it reveals the public behaviours and beliefs of those employed there (Parmelli et al., 2011). Therefore, if these aspects are neglected during the change; the change agent may misrepresent the context of the change process. Hence, employee resistance and lack of change continuity occur (Anders and Cassidy, 2014).

3.4. Change models

3.4.1. Planned approach to change: Lewin's model

In 1947, Kurt Lewin designed one of the leading models of change. He identified three stages of change; unfreeze, change and refreeze. 'Unfreeze', which requires investigating the current situation then enhancing the leading capabilities for change; 'change', which necessitate progress, connecting individuals and achieving changes; 'Refreezing' means maintaining the changes and the desired outcomes constant (Mitchell, 2013).

The problem in Lewin's approach is that it assumes that organizations function under steady states and that change can move in a preplanned manner from one station to another neglecting the fact that organizational change is a continuous and endless process rather than a pre-identified collection of separate and independent events. Authors also argued that the model only fits for small changes that happen in constant conditions; hence, it is not suitable for situations that require an accelerated transformational shift. Moreover, the some authors claimed that the planned approach to change
assumes that all stakeholders in a change project are keen to achieve the change, the fact that ignores organizational politics and conflicts (Mitchell, 2013; Todnem, 2005).

3.4.2. Prescriptive approach to change: Kotter's model

Kotter Model (Kotter, 1996) advanced the Lewin’s model and designates a type of prescriptive control of change where a sequence of steps has to be happened to conduct a successful change. It consists of eight levels and starts with creating a sense of urgency, creating guiding partners, designing the concept of change, empowering staff, planning short-term wins, staying steadfast and making the change persistent (Figure 3). Kotter claims that skipping any of these levels never produces the wanted outcome and only generates the illusion of speed (Kotter, 1995).

![Kotter's Eight Steps of Change](image-url)

**Figure 3:** Kotter model (Kotter, 1996)

Although Lewin's and Kotter's models have distinct associations, Kotter’s eight-step model presents more extended direction for achieving the change.
Kotter puts a significant emphasis on the weight of the team, sharing the vision and praising short-term wins.

A significant problem with following prescriptive procedures is that it does not allow the unpredictable issues that naturally arise in most change processes. Moreover, the model orders the control of change to a straight course thus neglecting the various repetitive nature of change (Shanley, 2007).

3.4.3. Situational approach to change: Contingency models

The situational or contingency model is an approach to change that based on the hypothesis that the structure and the achievement of an organization depends on the situational factors that it faces. It recommends modifying change approaches to reach "optimum fit" with the changing environment. The theory assumes that organizations and managers do not have any authority and options over situational factors and structure (Todnem, 2005).

Furthermore, the Senior and Swailes model of change consolidate every part of the organization, and the individuals engaged there. While building a vision for the prospect is also an essential element in this model, the importance focuses on the change means. The change factor is accountable for driving the change forward and is settled at the center of the design. Thus, in the setting of this model the change agent is eventually responsible for the accomplishment or failure of the move (Senior & Swailes, 2010).

3.5. Change models selected for this project

Although the researcher acknowledges the importance of the change agent during the change, he also recognizes the complexities of the education process. It tends to be more reactionary than strategic, as it is required to
respond to external factors. Also unlike Kotter’s and Lewin’s change models which are linear and thus do not equate with the complexity of change, educational context change is not linear and is a continuous and adaptive process that can be influenced by people and external forces (HSE, 2008). For these reasons, the researcher decided that the HSE model of change would be the most suitable model to guide this project.

The HSE model is based on an organizational development approach, which puts more focus on actively involving key stakeholders and staff. The researcher had also chosen the HSE model for its dynamic processing between the stages, which endure the complexity of change and affords a reasonable applicability to the change process.

Initiation, Planning, Implementation, and Mainstreaming are the four major elements of the HSE Model. The researcher believes that the backbone of the HSE model is in the initiation stage, which qualifies for successful planning and implementation. Each category also contains sub-categories that offer further clarity and guidance.
In the remains of this chapter, the researcher will elaborate on the different stages of the project applying the structure of the HSE model of change.

3.6. Initiation Stage

The first stage of the HSE model is initiation. The purpose of the initiation stage was to establish a soil for a successful change and making an early sense of the width and intensity of the change effort. It directs the researcher to have assistance within the organization and to build eagerness to drive the change. The stage includes early planning by recognizing the important factors that would impact the change as well as the people involved. That was an essential step to recognize the motives and to justify the needs for the change.

3.6.1. Drivers for the change

The researcher is involved in teaching anatomy course to year two medical students and is coordinating the cardiovascular system and respiratory system units. He had access to the curriculum documents including students’ reflections and feedback throughout the previous years. It is obviously noted from these curriculum documents that students’ summative assessment through written exams and Objective Structured Practical Exam (OSPE) did not include a structured feedback given to the students. In addition to that, directing meetings with the students and faculty indicated that the students don’t get benefit from their own feedback provided after each unit. They even lost the interest of providing the regular feedback at the end of each unit, without knowing what is the reaction of the faculty towards this feedback. They have also expressed their hope to receive immediate feedback on their
performance in written and OSPE exams. Those stated observations were the drivers that generated the change.

3.6.2. Stakeholders and Key Influencers

The term stakeholder refers to the person, group or organization that must somehow be considered into account by leaders, managers and front-line staff. Early mapping out the stakeholders in the initiation phase is an important step to involve them in the change process by defining their responsibilities and making their duties clear. The progress of an organization depends on the key stakeholders and what they consider as valuable (Cheung et al., 2015). On the other hand, neglecting to consider the stakeholders’ concerns and disregarding their participation is a weakness that might lead to low performance or even failure (Cheung et al., 2015). However, that does not indicate that all potential stakeholders should be settled, committed, or completely taken into account but rather the key stakeholders who have a significant political, ethical, and judgmental role. And so there’s more to knowing the stakeholders than just identifying them and stakeholder prioritization become a requisite before implementing change within an organization (Bryson, 2004; Cheung et al., 2015).

The researcher prioritized the stakeholders by considering the influence of each stakeholder on and in a project, as well as their level of engagement in the project due to the influence it may have on them. A good rule of thumb when prioritizing the stakeholders is to keep in the mind the well-known power/interest grid for stakeholder prioritization. The gird (figure 5) demonstrates four groups; one group includes those who possess both interest and significant power in the organization. Another group includes
those who have interest but little influence. The third group involves those who possess power but have little interest and finally the last group contains those with little interest and low power (Pandi-Perumal et al., 2015).

The dean and the head of the department are having both interest and significant power in the organization. They show interest to achieve the change, but they need maintaining close and good working relationship. The students and the faculty, who have high interest but little influence, have also shown their enthusiasm for the proposed project and so they require special considerations to maintain their interest. The curriculum and assessment committees’ members possess authority but have little interest and are

Figure 5: Power/interest Grid
considered as a source of risk that requires careful monitoring and management. Engagement of the dean and the head of the department was of great help in convincing these committees about the advantages of the project and its possible great outcomes. Finally, the organizing staff, who had little interest and little power, they have some involvement but relatively low priority (Pandi-Perumal et al., 2015).

3.6.3. Preparing to lead the change

During initiation stage, the researcher performed a Force Field Analysis and studied the drivers of change thoroughly and considered any resisting forces. The data identified the drivers and resistors for change and also highlighted the possibility of successful change.

According to the force field theory, some of the forces are acting in opposite direction in a balanced mode to keep the ‘status quo’ of any organization. A change in an organization needs a shift in this balance. The change will occur when the forces promoting the change are greater than those that are resisting it. The acting forces may be either idea about the fashion the organization should operate or the evaluations of individuals or groups in the organization (van der Hoorn, 2016).

The researcher explained the details of the project to his colleagues involved in implementing the project, to the head of the department, and to the dean to get their views and share and to genuinely engage them in the change. The unlimited support and collaboration of people in the medical college was obviously noted by the researcher.
In spite of the extraordinary effort that has to be afforded by the faculty and staff to implement the project, the enthusiastic spirit that found overcome these negative forces. Figure 6 illustrates the positive and negative drives that would influence the change. The forces that promoted the introducing the change project included students' needs for the feedback, interest of faculty and staff participate in the project and organizational needs for achieving the accreditation criteria of getting structured feedback from the students. Also, the literature that supports the advantages of the feedback on students' learning was a very good positive drive.

Figure 6: Force Field analysis of the change

On the other hand, the researcher had anticipated the negative energies resisting the change. These were students' resistance and fear from the new assessment, as the formative assessment needs an extensive preparation and readiness. Also the great effort needed from the staff and faculty with unwillingness of some of them to have more workload. Moreover, the time management needed for preparation of the OSPE and the written exams and lack of resources.
3.6.4. Managing resistance

While implementing a project, understanding of why people might oppose changes is crucial for success. The reasons might be ’a disorientation of the change and its influence, a belief that the change is not compatible with the organization, a quiet fortitude for change or a desire not to lose anything of significance’ (Kotter & Schlesinger, 2008). Communicating ideas and educating people through discussions, presentations, or memos and reports can help them make out the need for and the reasoning of the change and it the most common approach to overcome resistance to change (Kotter & Schlesinger, 2008). Also, Burnes (2015) stated that staff and faculty require support during the planning and implementation phases, which will install commitment and overcome refusal. This support would encourage healthy change during the transitional period and promotes stability.

The detail of the change was adjusted and developed over several weeks. The researcher arranged separate meetings with the head of the department, with some of year two students, and with the anatomy faculty and staff members. The purpose of the meetings was to increase their engagement and to clarify their roles in the project. During these meetings, the researcher was able to investigate possible barriers that might build resistance and thus delay the project. Accordingly, inquiries and concerns were acknowledged and were clarified.

The researcher identified that the core cause of resistance was the great effort needed from the staff and faculty with the reluctance of some faculty members and staff to have more workload. However, he did not consider this response to be entirely negative as according to Ford et al. (2008), resistance
to change can be positive if it drives to open discussion and investigation. While the conversations were not entirely constructive, the researcher acknowledged that this was an indication of progress; and that these replies were reflective of engaged participants (Robbins & Judge, 2013). The outcome of these meetings was the decision of introducing the TWFS after a formative exam for year two students at the end of the respiratory system unit to discuss the cardiovascular system and respiratory system units.

Once the decision has been taken, the researcher submitted the project proposal to the ethical committee for approval before progressing with the project. They provided the approval on 27th of October 2015 (appendix 2), provided that any change to the design or methodology should be reported to the committee for approval before implementing any change and asking for six-monthly progress report starting from November 2015 and so the first report will be due in April 2016.

The researcher decided the dates of the formative assessment and announced them to the students. He also encouraged the students to work hard for the coming formative assessment and highlighted its advantages and its impact on their learning.

Another essential step for the project to go ahead was to identify and prepare the resources that are required for the planning and implementation of the project such as rooms, and personnel. The researcher, who has been a unit coordinator of the cardiovascular system and the respiratory system units, was aware of the units’ timetable of the students and the faculty members who may be interested. The head of the basic medical sciences department and the dean were interested and supportive to the change project. The
anatomy faculty members were willing to help in the formative exam processing and the managing staff agreed to prepare the labs and the rooms. At this stage, the researcher had a sharp vision of the magnitude of the change project and the required information: the driving forces, the key stakeholders, the expected sources of resistance, and the available resources. The researcher believed that the positive forces would drive towards the successful implementation of the TWFS.

3.7. Planning Stage

The aim of the planning stage of the HSE model was to gain a large deal of help and eagerness by attacking key stakeholders through additional communication and engagement of an agreed future vision. A more detailed plan of the change including the roles of the key stakeholder, the needed resources, and the potential impediments would be obtained. Moreover, the complete implementation of the change would be established. Three steps assisted the planning stage: building commitment, determining the detail of the change, and developing the implementation plan (HSE, 2008).

3.7.1. Building commitment

Building commitment of the key stakeholders is critical. At this stage, the researcher focused on engaging the students, the managing staff and the faculty who were involved in the learning process. He arranged separate meetings with them to discuss the aim, objectives, and the proposed plan of the project. During these meetings, the researcher discussed the details of the project and explored possible barriers that might resist its implementation. He
answered all the inquiries and concerns and welcomed all the suggestions that might be beneficial.

3.7.2. Determining the detail of the change and developing the implementation plan

Change is a political process and relays upon power. If the change managers do not have sufficient authority, they may use other means to gain power. They may involve key people in positions of authority or spread control of the process to a wider group and colleagues (Skogstad & Whyte, 2015). It was, therefore, necessary for the researcher to consider the sources of power that would enable and support the implementation of the feedback session. Agreement of the dean and the head of the department about the details of implementation made the arrangement for the TWFS much easier. In addition, the researcher was one of the actively involved faculty members and the unit coordinator and that helped greatly in the management of the timetable and processing of the change.

As a consequence of the discussions in meetings with students and faculty, the researcher explored their perception and received their needs as well as recommendations that might be helpful in planning for the educational content of the formative exam as well as the structure of the feedback session. The outcomes of these meetings were effective. The students mentioned that the formative assessments that they used to have before were easy assessments and the faculty didn't use the real final exam questions, which made them insignificant and not beneficial. They have expressed their needs of having real difficult questions in the MCQ part of the formative assessment and highlighted the importance of having a real OSPE exam setting as
regarding the timing of each station and the clear marking criteria for each question.

On the other hand, the faculty had acknowledged critical deficiencies in the students’ clinical knowledge such as embryological origin of some anatomical structures and their clinical correlations and the difficulty in identification of some important anatomical structures. Also, determining the incentives that may be given to the managing staff who would participate and agreeing of all the logistics for the formative assessment and the feedback session.

All agreed to conduct the suggested formative exam and the TWFS during the last week of the respiratory unit (in week ten of the fall semester), after the end of the six-weeks cardiovascular unit and four-weeks respiratory unit. This timing was approved to give the students the chance to be prepared for the exam and to have the last 5 weeks remaining of the semester to apply any changes they might gain from the feedback session before the final summative exam at the end of the semester. It would also allow the faculty to apply any changes in their ideas before putting the final summative exam. At this moment, the researcher had reached a complete clear figure of the plan and was ready for the implementation stage. The coming section includes an explanation of how the change was implemented and how energy was sustained.

3.8. Implementation stage

During this stage, the researcher has implemented the change project guided by the change model. The objectives of this change project were to design a two-way feedback session between students and faculty based on formative
assessment and encourage the students to reflect on their learning. The measurement of the students and faculty members’ perception on the feedback process and its impact on the students learning process was also performed. Therefore, genuine information had been obtained reflected the extent of satisfaction of the students and faculty by gathering quantitative and qualitative data through a questionnaire and focus groups discussions. Also, interviews with the anatomy faculty explored the impact of that feedback process on the faculty. This process informed through analysis; process and behavioural changes that might lead to an improvement in learning Anatomy.

3.8.1. Preparing for the formative assessment and TWFS

After obtaining the ethical approval on 27th October, the researcher informed the students that the project would be implemented. One of the anatomy faculties other than the researcher described the whole process to the students and highlighted that it is an optional opportunity for all the students to participate with no implications on their grades. He also obtained the written consents that indicated the students’ awareness and agreement of all the details of the project (Appendix 3). The final dates and timings of the formative assessment as well as the TWFS were also announced to the students. The researcher then encouraged the students who agreed to participate to work hard and to be well prepared for the formative assessment to get the maximum benefits. The items of questionnaires also were discussed with a focus group of ten students as well as the anatomy staff to refine them to meet the objectives of the study.

The agreed formative assessment date was on 17th of November 2015 (timetable appendix 4). A total of four hours slot for the formative assessment
and two hours slot for the TWFS on the next day were allocated in the timetable. The anatomy faculty members, including the researcher, were responsible for preparing the formative exam questions. They distributed the tasks so that each one of them was responsible for the part of the objectives that he or she was involved in teaching. The questions were chosen to cover most of the anatomy objectives taught in the cardiovascular and respiratory units. They finally agreed on an MCQ exam containing thirty-five questions and an OSPE exam including fifteen practical stations. The researcher put in mind the students’ needs of having real exam questions while finalizing the exam.

The researcher then organized an orientation session for the managing staff. The main purpose of the session was to engage them in the change process. He informed them about the incentives that they would take for the extra work hours, and make sure that they would play their roles in the best way that ensure the success of the process.

### 3.8.2. Organization of Formative Assessment

One hundred students out of total one hundred and sixteen students agreed and attended the formative assessment. The students were divided into four groups of twenty-five students, two groups in the first two hours and the other two groups in the second two hours. In each of the two hours slots, the groups were distributed one group started the OSPE in the anatomy lab and the other started the MCQ exam in the lecture hall. Switching between the two groups occurred at the middle of the session.
Precautions have been taken to ensure that the students of the first two hours were not communicated with the students of the second two hours through prohibiting the mobiles and the electronic devices as well as retaining the first two hours students after finishing the exam till all the second two hours students become collected and cleared in one of the lecture halls.

3.8.3. Organization of the TWFS

One day after the formative assessment, a TWFS was introduced. The researcher divided the component of the TWFS into two main components. The first part was to provide the students of the details of their performance in the exam. The researcher demonstrated all the questions provided in the MCQ exam with their ideal answers together with their question analysis. He also described all the difficult questions that showed high difficulty index. In addition, the researcher demonstrated a power point presentation showing the practical specimens that were used in the OSPE together with the right answers, which stimulated the discussion with the students.

In the second part of the TWFS, the students were allowed to reflect on the formative exam in particular and on the whole learning process in general. An open discussion with the whole participating students was permitted in the presence of the researcher and the anatomy faculty. The students provided the faculty with their concerns about the teaching process as well as the examination procedure.

3.8.4. Data collection

Students and faculty were the main sources of information. The researcher utilized both quantitative and qualitative data to measure their perception.
3.8.4.1. Quantitative method

At the end of the TWFS, the researcher asked the students to voluntarily participate in filling a questionnaire. The questionnaire was developed from the literature available and modified to match the local situation after being piloted on a group of students and the faculty (Almously et al., 2014). The items in the questionnaire form obeyed Likert-type rating scales in which the respondent is asked to show the level of agreement or disagreement according to five-point Likert scale (appendix 5).

The researcher designed the items in the questionnaire to include three main themes. The first thought was to explore the TWFS organization and timing. The second issue was dealing with the formative assessment and its usage as a tool to enhance the feedback delivery and whether these low-stake types of exams could be useful tools in motivating the students’ learning. The third consideration was to measure to how extent the feedback process was conducted efficiently and how much the feedback provided by the faculty was constructive.

For the sake of any unanticipated findings and giving the students the space for description and clarification of their thoughts, the researcher added some open-ended questions at the end of the questionnaire. These inquiries included what did you like most in the session, and what is your suggestions for improvement in teaching, formative exam and TWFS (appendix 5).

3.8.4.2. Qualitative method

The researcher conducted the qualitative evaluation through focus group discussion with the students as well as semi-structured interviews with the anatomy faculty who were involved in the study. The focus group discussion
has been carried out to capture the views of the students who had participated in the formative and the TWFS.

The researcher was responsible for facilitating the discussion of the focus group. Puchta & Potter (2004) stated that the efficient focus group facilitator should be capable of generating a discussion in which he or she participates very few. In this regard, the researcher was the most suitable one to moderate the focus group discussion session. His awareness of the topic and the needed information made him capable of addressing the discussion at a pace that allowed all themes to be discussed thoroughly.

The researcher had randomly chosen ten students and invited them by e-mail to attend the focus group discussion. The invitation included the date, venue and rational of the invitation. Eight students responded to the call and participated in the meeting in one of the college meeting rooms.

In the beginning of the session, the researcher stressed the value of participants’ contributions to the research and indicated his own role as an educator rather than a faculty. He coded the students participated in the focus group from 1 to 8 starting by S1 on the right of the facilitator and ending by S8 on the left and take their consent for audio recording. After that, the researcher investigated the students’ general reaction towards the TWFS and the formative assessment. Also, he explored the students thought regarding the different components of the TWFS and the impact of feedback given by the faculty on their learning. The meeting lasted for around fifty minutes and at the end the researcher thanked the participants for their positive contribution. The themes of the discussion as well as its content analysis are demonstrated in (Appendix 6).
The anatomy faculty were another valuable source of information for evaluating the formative as well as the TWFS. The researcher conducted two individual semi-structured interviews with the two anatomy faculty who had participated actively in the project and coded them as F1 and F2. The purposes of these interviews were to explore their beliefs on the implemented TWFS and to approach any difficulties that may prevent future implementation.

The researcher transcribed all the audio-recorded interviews and analysed verbatim manually through an iterative process of thematic content analysis to identify emerging themes.

3.9. Mainstreaming

When leading the organization to appropriate change, it is important to estimate the balance between the needs of both those involved and the organization (Senge, 2014). Therefore, it is necessary for the change leaders to communicate and regularly engage with those concerned, which allows acknowledgement of feedback and increment the likelihood of inserting the change into everyday activities (HSE, 2008).

The mainstreaming stage focuses on the success of the change initiative and maintaining new ways of working (HSE, 2008). The researcher declared the importance of engaging with those involved and felicitating them on their achievement towards change. Kotter (1995) refers to this as celebrating short-term wins. The researcher contacted each one individually to thank them for their time and participation and also to find out their feedback about moving forward with the project. The researcher also discussed the implications of the project and the ability to generalize the idea in all disciplines. This behavior
was essential in keeping the momentum and supporting participants to continue engaged in the change process (Kotter, 1995).

Also, the students’ feedback has been submitted at the end of the semester and has been added to the course documents was highly supportive for maintaining this TWFS and re-implement it in the future. It encouraged the dean and the head of the department to support the idea of generalizing this concept for all the disciplines and units as a proper way to get the feedback timely and efficiently.

3.10. Summary

The change process has been started by actively involving key stakeholders through continuous discussion then responding to their opinions and inputs by modification of the change process. TWFS implementation required an extensive and collaborative work between unit coordinator, concerned faculty, and organizing staff to plan and to implement it in a pattern that would benefit the students. To maintain the change and promote the culture of feedback during anatomy learning, engaging with those involved and felicitating them on their achievement towards change.

Evaluation of the change process at all its stages was a significant step in the mainstreaming. The results of surveys and interviews collected feedback from the faculty and students would be utilized to guide further improvement. Details of the result would be presented in the coming evaluation chapter, which includes details of the evaluation process guided by Kirkpatrick evaluation model.
Chapter 4

Evaluation
Chapter 4: Evaluation

4.1. Introduction

Program evaluation is an important burden for anyone supervising a medical education program (Frye & Hemmer, 2013). Evaluation is the well-organized gathering and interpretation of information. It is related to the planning, implementation, and consequences of a project for the target of tracking and improving its efficiency and quality (Newcomer et al., 2015). Many authors have recently described the evaluation as the standardized examination of the value, or importance of an object (Kim, et al., 2015).

Concerning education, evaluation can be viewed as a value or worth of an educational program, as the educational programs are designed mainly for change; therefore, effective program evaluation should include discussion of the changes and its appraisal. Evaluation in education comprises the following elements; the appropriate model, the theory behind the model, the method of implementation and the impact of the judgment. A satisfactory program evaluation allows educators to know about the efficiency of the programs and its development comprehensively (Posavac, 2015).

In this chapter, the researcher delineated the different evaluation models with more discussion on the Kirkpatrick evaluation model, which had been decided to be the suitable design of the current project. He displayed the results of evaluation in details concerning the objectives of the project to reflect on whether the project met those goals. The chapter ends with a conclusion outlining the key points raised.
4.2. Theories behind the evaluation methods

Learning about evaluation theories is crucial to make the researchers determine the suitable evaluation method. Also, evaluation theories consolidate the experiences acquired from earlier practices (Ahmady et al., 2014), evaluators who don’t have enough knowledge about theory are more liable to make errors and fail to mount on previous successes (Frye & Hemmer, 2013).

Reductionism, system and complexity theories are the well-known theories that were the basis of evaluation models. Reductionism assumes that understanding the program components and elements separately can fulfill the complete evaluation. This theory depends on the linearity in program elements. Particularly, when the changes in individual program components are anticipated to have an expected effect on the outcome. The limited change would be expected to have a limited impact while a significant change will have a high impact. The belief of linearity is evident in some traditional program evaluation models as the Logic Model (Frechtling, 2007)

When the association between program elements and outcomes is non-linear, small changes in the components of the program may lead to substantial shifts in the results and vice versa. The system theory or complexity theory consider this non-linear association. It takes into account the complex nature of the educational programs and the concept that the outcomes cannot be easily evaluated. So, not only by demonstrating the elements but the relationships between the elements and the circumstances are of great significance in program evaluation. This theory acknowledged that change is an internal part of a system and stated the value of (context) since an
outcome is not explained only by parts but by the relationships between and among those components and their environment (Frye & Hemmer, 2013).

4.3. **Evaluation Models and Tools**

There are many commonly used models of evaluation. These models are the experimental / quasi-experimental model, the CIPP model, the logic model, and Kirkpatrick’s four-level model (Gižienė & Vasiliauskaitė, 2015; Thistlethwaite et al., 2015).

The experimental / quasi-experimental model originates from the reductionist theory; the validity of results relies on the approval of the relationships between program components and needed outcome following an interference in the isolated elements of the program. However, this model is less useful in medical education programs evaluation as the highly invented experimental schemes are complicated to be implemented in medical education (Campbell & Stanley, 2015).

CIPP model is a comprehensive framework used to direct the evaluation of programs, projects, products, institutions and systems. The main purpose for applying this model is its comprehensiveness and further employment, because some information can be gathered regarding desirable objectives of the development plan, desirable operational programs and projects and desirable executive results of the program to help promote academic activities and achieve the organization’s desired efficiency.
Corresponding to the letters in the acronym CIPP, the model core concepts are Context (goals), Input (plans), Process (action) and Product (outcomes) (Figure 7). Good application of the CIPP model enables examination of the program outcomes among participants and relevant groups. This model is suitable to be applied during the planning phase of the program (Ghafari et al., 2015; Stufflebeam, 2003).

Logic model is a precise way to examine to which degree a program has accomplished the designed results. It examines four essential elements related to an education program; the inputs (resources), activities (tasks), outputs (results) and outcomes (impact) (Figure 8). However, its linearity might lead to focusing only on the specific elements of the evaluation and missing out the unexpected outcomes that may naturally emerge during the evaluation process (Frechtling, 2007; McLaughlin & Jordan, 1999).
The researcher chose the Kirkpatrick model to evaluate the project. In the coming part, a description of the model followed by its application and the results obtained.

Kirkpatrick (four levels) model is another representation of the linear causality of the reductionism theory. It focuses on the explanation of the change consequences. It is more powerful as it evaluates four aspects, e.g. the learners’ satisfaction, the learning gained from the program, the changes in learner behavior following the change, and the influence of the change in the whole institution or society.

The most considerable addition of Kirkpatrick to educational evaluation is the brightness of its target on the outcomes of the program. This was ideally suits the current project. The four hierarchal levels of Kirkpatrick model include learner reaction, learner knowledge, learner behavior, and the results achieved by the student (Frye & Hemmer, 2013) (Figure 9).

Figure 9: The Kirkpatrick (four levels) approach adopted from (Kirkpatrick, 1996)
Despite all criticism to the Kirkpatrick model, it is yet the extensively used model as it encourages evaluators to address the educational program in a systematic way. The researcher decided that level one Kirkpatrick evaluation would be satisfactory for the current action research. Accordingly, the program was evaluated at the level I (reaction) to provide improvement and it is clearly stated that positive response does not assure positive learning, but a negative reaction toward a program certainly decreases the likelihood of positive results in successive levels.

According to Kirkpatrick evaluation, to assess participants’ reactions to the program, the researcher determined the targeted reactions and whether they are satisfied or not and asked the participants what they thought about the project. The participants had been asked, through the questionnaire and the focus group, whether this session was useful for learning and if individual components of the session and the way it had been implemented were perfect.

The higher Kirkpatrick ‘levels’ require the evaluator to assess participants’ learning and behaviour gained during the program and this is not applicable in this project. Implementation of TWFS is not directly providing the students with information that can be measured in this way.
4.4. Results of data collection

Students and faculty were the main sources of information. The researcher utilized both quantitative and qualitative data to measure their perception.

Ninety percent (n=90) of the students who have participated in the project completed the questionnaire. The results of the analysed data, the number of 'agree' and 'strongly agree' responses were merged and displayed as 'agree', while the number of 'disagree' and 'strongly disagree' replies were combined and granted as "disagree" (Table 1 and Figure 17).

<table>
<thead>
<tr>
<th></th>
<th>Agree / Strongly Agree (Agree)</th>
<th>Neutral</th>
<th>Disagree / Strongly Disagree (Disagree)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I enjoyed the session</td>
<td>83 (92%)</td>
<td>6 (7%)</td>
<td>1 (1%)</td>
</tr>
<tr>
<td>The Time of the session was appropriate</td>
<td>85 (94%)</td>
<td>4 (5%)</td>
<td>1 (1%)</td>
</tr>
<tr>
<td>The session has helped me to identify my strengths and weaknesses</td>
<td>81 (90%)</td>
<td>5 (6%)</td>
<td>4 (4%)</td>
</tr>
<tr>
<td>The faculty has provided me with specific advice on how to improve my performance</td>
<td>79 (88%)</td>
<td>8 (9%)</td>
<td>3 (3%)</td>
</tr>
<tr>
<td>The session promotes active reflection on the effectiveness of teaching</td>
<td>77 (85%)</td>
<td>9 (10%)</td>
<td>5 (5%)</td>
</tr>
<tr>
<td>The session encourages feedback that enhances learning.</td>
<td>78 (87%)</td>
<td>9 (10%)</td>
<td>3 (3%)</td>
</tr>
<tr>
<td>Exam without marks prevents motivation for students cheating.</td>
<td>78 (87%)</td>
<td>9 (10%)</td>
<td>3 (3%)</td>
</tr>
<tr>
<td>It is difficult to motivate students' performance on exams without marks</td>
<td>36 (40%)</td>
<td>20 (22%)</td>
<td>34 (38%)</td>
</tr>
<tr>
<td>Sharing the question analysis of the exam with the students was beneficial</td>
<td>87 (97%)</td>
<td>2 (2%)</td>
<td>1 (1%)</td>
</tr>
</tbody>
</table>

Table 1: Students' response to the questionnaire
Ninety two percent (n=83) of the students agreed that the TWFS was enjoyable and Ninety four percent (n=85) admitted that the time of the session was appropriate (Figure 10).

Some of the students' comments from the focus group discussions also supported these results.

**S1**: "the session was very well-organized and the timing was ideal as it was ok"

Small number of students viewed different opinions about the enjoyment and the timing of the session. They mentioned that the formative exam stressed them and the session would be much better if it was at the end of the semester to include the whole objectives of the final exam.

**S3**: "I was so stressed to get the maximum benefits of the formative assessment"

**S4**: “The timing would be much more beneficial if it was done at the end of the semester to include all the final exam contents”.

**S5**: “I think this is the first time we feel that we will get benefits from our own feedback because of the timing of the session. The staff might listen to our feedback and do some modifications in the final exam”

![Figure 10: Students’ response to setting and timing of the session](image)
Ninety percent (n=81) of the students demonstrated that the TWFS helped them to identify their strengths and weaknesses (Figure 11).

![Figure 11: TWFS helped the students to identify their strengths and weaknesses](image)

In addition, some of the students' comments from the focus group discussions also supported these results.

*S2: "I discovered that I am so week in identifying some important structures in the OSPE and the embryology needs more attention"*

Eighty eight percent (n=79) of the students agreed that the faculty have provided them with specific advices on how to improve their performance (Figure 12).

![Figure 12: The faculty have provided the students with specific advices on how to improve their performance](image)

Some of the students' comments from the focus group discussions also supported these results.

*S3: "I discovered that I am so week in identifying some important structures in the OSPE and the embryology needs more attention"*
Eighty five percent (n=77) of the students admitted that TWFS promotes active reflection on the effectiveness of teaching (Figure 13).

However one of the students’ comments from the focus group discussions indicated that it is sometimes difficult to mention negative feedback directly to the concerned faculty and it is much better to be through a written survey.

   S4: Students’ comments on questions was helpful
   S6: “I couldn't say any negative feedback in front of the faculty. I prefer writing my comments in an anonymous survey”

Eighty seven percent (n=78) of the students agreed that exam without mark prevents motivation for students cheating (Figure 14).

The students and faculty members’ comments from the focus group discussions were supportive.

   S2: "When the exams have no marks, it gives us the opportunity to think freely without being afraid of the mark and results"
F2: “one of the great advantages of the formative exam is that its low stake nature which prevents motivation of the students cheating”

Only forty percent (n=36) of the students agreed that it is difficult to motivate students’ performance on exams without marks (Figure 15).

Figure 15: It is difficult to motivate students’ performance on formative exams

Large number of students viewed different opinions in the focus group discussion. They mentioned that getting marks is not as important as living the real exam setting and reflect on it.

S7: "I know many students came to formative without studying…. there is no marks"

S8: “Positive feedback given during learning is really encouraging; I think it deserves working hard”

F1: “Intensive dedication is required from both learners and faculty to maintain the process”

F2: “I think the feedback that the students received in the TWFS is helpful regardless the students’ preparation level for the formative. When he listens to the general feedback provided by the faculty as well as the opportunity given to reflect on the questions and the exam setting.”
Ninety seven percent (n=36) of the students agreed that sharing the question analysis of the exam with the students was beneficial (Figure 16).

![Figure 16: Sharing the question analysis of the exam with the students was beneficial](image)

In the focus group, the students' comments were highly supportive as follow:

S7: "It is very good idea to get what are the answers of the whole batch. It is really supportive and motivating”

F2: “I noticed how the students were impressed by the question analysis part. This helped each one to identify his level among his colleagues”

F1: “Disclosing the question analysis helped the students to appreciate the efforts done by the faculty in preparing the exam questions”

The interviews with the Anatomy faculty have further confirmed the positive impact of the TWFS. Both of them agreed that the immediate feedback is the astonishing outcome that would help students to identify their needs and how to manage them before the final summative assessment.

They also highlighted the great challenges in maintaining the process because of the great effort needed in preparation of a high standard formative assessment, which might need new questions and setting. They expressed their willing to learn more about providing effective feedback to the students.
Also, they agreed to make any modifications that might be indicated after the TWFS.

Here are some of the faculty comments:

F1: "I think the TWFS had a significant impact on students' learning because it came following a live image of assessment. The students were learning and assessed at the same moment. The immediate feedback they got would help them to correct their mistakes before the final assessment."

F1: "Giving an effective feedback needs special skills. I don't think that the entire faculty are skilful for that. It would be a great idea if we had a training in how to provide an effective feedback to the students"

F2: "We have to consider the great effort needed to implement the TWFS after formative assessment. For a successful formative we need to prepare high standard questions with exactly the same level of difficulty as the final exam questions."

F2: "We will look at the students' feedback and do the necessary modifications before the final summative exam."
Figure 17: Overall students' response to the questionnaire
4.5. Summary and Conclusion

The TWFS was implemented and fulfilled its objectives. Its evaluation revealed that it was an adequate method associated with a positive educational influence. All students appreciated the opportunity given to get timely and effective feedback and to reflect on the learning process. Prominently, a clear motivation and collaboration by the faculty and the administration were reported. The significant challenges related to the TWFS implementation were the additional workload to get a fruitful and useful session.

The following challenging stage would be to inculcate the TWFS in all the units in order to maintain the feedback as part of the daily practice. In the next chapter, the researcher will discuss some inquiries that are required to be considered as part of the mainstreaming process: What are the lessons learned from the implemented change project? And do the gains of the TWFS exceed its sacrifices? Besides, what are the recommendations to maintain future TWFS into the core of the schedule.
Chapter 5

Discussion and Conclusion
Chapter 5: Discussion and Conclusion

5.1. Introduction

Learning from experience follows the evaluation (HSE, 2008). In this chapter, a critical view of the whole project experience will be analyzed and presented. The researcher will interpret the impact of the project concerning the strengths and limitations to obtain the fundamental learning points and outline recommendations for later advances. The researcher will also propose a structure pattern for installing the TWFS following the formative assessment into the different courses.

5.2. Implemented change

The change project ‘implementation of two-way feedback session during learning anatomy’ was implemented as a response to the shortage of timely and structured feedback during the learning process within the researcher’s organization. The students want to know (and use) the reasoning behind judgments and they were always complaining that they need an explanation for the assessment criteria.

The HSE model guided the change project. The initiation process claimed constant engagement of stakeholders. The students, the anatomy faculty, the managing staff, the head of the basic medical science department and the dean of the college of medicine were actively involved.

The researcher planned the change project after analyzing the local circumstances and policy of the organization to provide a suitable environment for implementing the change. The formative exam was a satisfactory method for giving feedback to both the students and faculty. It
offered an experiential learning activity in a simulated context and so eliminating the students’ stress that might appear in summative assessment. It also advanced the feedback delivery in an accurate and structured way.

In TWFS, the faculty provided the students with a structured and timely feedback on their performance in general and on the formative exam in particular. Also, the students reflected on the whole learning process, including the real examination experience and contents that they have encountered in the formative assessment.

The evaluation criteria were related to the aim and objectives of the project. The researcher used Kirkpatrick approach (Level 1) for evaluation utilizing both qualitative and quantitative methods. The results of the evaluation revealed achievement of the objectives.

5.3. Change impact

Participating students have perceived the session as effective. The questionnaire analysis and the comments from the focused group have revealed that it has helped the students to recognize some of their shortfalls, and the best way to deal with these defects. Eighty eight percent of the students agreed that the faculty had provided them with specific advises on how they improve their performance, which demonstrates that how much the session was beneficial and supportive to the learning process. Eighty seven percent agreed that the session enhanced the feedback, which promotes learning and eighty five percent indicated that TWFS promotes active reflection on the effectiveness of teaching. These findings indicate that the session was a successful approach to stimulate the two-way feedback road
between the faculty and the students. It allows open discussion between the two parties in which both of them can reflect freely on the process.

These findings were identical with the literature of formative assessment and feedback that the researcher had elaborated in the review chapter. The formative assessment followed by effective feedback help students to narrow their gaps, to self-regulate their learning, and to improve their self-efficacy (Brookhart & Nitko, 2015; Llorens et al., 2016).

The outcomes of the implemented TWFS were also analogous to other similar studies in giving effective feedback. Ramani and Krackov (2012) stated that formative assessment and feedback are crucial to the educational means and supporting students to approach their greatest potential. The procedures and circumstances for valuable feedback delivery are well reported and include a particular learning environment; a “two-way conversation”; and acknowledgement and reinforcement of good practice.

John McCarthy (2016) stated that the impact of high-quality assessments is disabled unless feedback is pointed and timely so that the knowledge obtained is helpful to the individual's needs. The researcher decided the timing of the formative and the TWFS on the 10th week of the 15 weeks semester and so giving the students the feedback and receiving theirs timely within the semester and immediately after the formative. The participated students considered the timing of the TWFS was very useful. It allowed the students to get the benefits of their own comments. Both the students and the faculty had sufficient time after the session and before the final summative exam, to apply any needed changes or any valuable outcomes from the feedback gained during the session.
Many authors had agreed that timely feedback is a crucial part of continuous assessment as it notifies the students on how they are proceeding and how they can develop. If feedback is provided to the students on each part of continuously, then they can manage their future education concerning this feedback (John mccarthy, 2016; Pope et al., 2014; Slipper et al., 2014 Zehra et al., 2015)

O’Farrell (2002) concluded that good quality, complete and timely feedback is a very influential factor in driving student learning. Assessment should afford feedback to students on their advance towards the accomplishment of learning outcomes. Feedback will allow students to understand where they have done properly and shown what they could develop on, as well as explain the grade/mark of summative evaluations.

The faculty and the students agreed that the low stake nature of the formative experience prevents motivation of the students cheating which promotes the process of learning. It can be considered as an approach to prevent cheating by offering the students the exam experience without marking pressure. Many authors suggest more frequent, low-stake assignments to reduce the pressure on students (Bain, 2015; Lang, 2013).

Involving students in their own assessment means that they must know what are the aims of their learning. Communicating these aims is not easy, but the rewards of successfully attempting it are quite considerable, not only for help in assessment, but also in the obvious potential for self-direction in learning. The researcher shared the question analysis of the formative assessment with the students and nearly all the students (ninety seven percent) viewed this as beneficial. It introduced the students to the exam from the teacher’s
prospective and made the students appreciated the efforts done by the faculty in questions selection and judgment. It demonstrated one of the engagement tools that have been offered to the students.

Although the faculty members want honest feedback on their performance as teachers and evaluators, it is believed that this feedback has to be given anonymously for students to feel safe (Glowacki-Dudka & Barnett, 2007). Some students indicated that it was difficult to disclose negative feedbacks in front of their faculty and prefer writing their comments in an anonymous survey. This study challenges the belief that student to faculty feedback needs to be anonymous and suggests that open two-way discussion between the student and the faculty would provide real benefits to both of them. Dudek et al. (2016) stated that many of the elements of effective feedback require or are promoted by a non-anonymous or "open feedback" process as protecting anonymity comes at the cost of timely feedback.

The interviewed faculty agreed that the immediate feedback is the excellent outcome that would help students to identify their needs before the final summative assessment. They also expressed their willing to learn more about providing efficient feedback to the students and agreed to make any modifications indicated during the TWFS.

Many authors acknowledged that training programs to the faculty are beneficial, and most the teachers are willing to listen to assessment ideas and to learn (Al Wahbi, 2014; Derakhshan et al., 2015). Ulmer (1991) stated that most of the faculty are willing to change their teaching methods and their prospects about how students perform when a variety of assessment indicators show a problem.
5.4. Project challenges

5.4.1. Faculty prospective

One of the most significant challenges that opposed the project is the construction of the formative exam in regarding time for preparation, resources, high standard questions needed and the efforts required of the participating faculty and the organizing staff. Convincing the staff to prepare high-quality questions and make this extra effort is a challenging. Therefore, it would be beneficial to develop methods that would overcome these hurdles. Browne et al. (2013) have utilized senior students to facilitate the conduction of the formative exam, which may reduce the efforts needed by the faculty as well as its benefits for the students learning.

Also marking of the formative assessment is another big load on faculty as if you have to give feedback timely and effectively, the formative assessment should be marked quickly. Some authors studied the effectiveness and reliability of peer marking which might be useful help in promotion of the formative assessment and students learning (English et al., 2006).

Not all the faculty are qualified for giving effective feedback. Hyland (2013) stated that the interviews with the students confirmed that most students believed that feedback can help them in their studies, but it is also clear that they saw this feedback varied enormously among faculty members in terms of its quantity, focus, style and effectiveness. Accordingly, faculty development programs and training of the faculty should be parallel to the change implemented.
5.4.2. Students prospective

Another significant challenge was how the students will deal with the formative exam and will they take it seriously or not? In this study, only forty percent of the participated students agreed that it is difficult to motivate students’ performance on exams without marks, while thirty-eight percent disagreed and twenty percent preferred to be neutral.

As mentioned earlier in the review chapter, students are mostly driven by what is going to add to their final mark. However, although formative assessment will not share directly to a final mark, it does play an important role in helping students increase their grades. And if students utilize their spirits to activities that earn them grades, then it is essential to convince them how they can advance their grades through adopting formative assessment. The researcher encouraged the students to study well before the formative assessment to get the maximum benefits from the feedback.

Saidi (2015) stated that Formative assessment is vital to learning in its intention is to give suitable and timely feedback to students on their learning, and to help them to improve their future work. This should be sufficient to drive students to practice formative assessment seriously. Students will also be excited if they clearly understand the point of their work; how it links to the course, the module, and their career goals; if it is mostly rewarding or satisfying; or if they can see their knowledge and skills advancing. Good quality formative assessment will emit all the qualities and more.
During the TWFS and while giving feedback to individuals or groups, the dialogue between the students and the person giving feedback will promote the process of learning. It mounts on the student's own self-assessment and helps learners take accountability for learning. This structured and timely approach helped both faculty and students to know what is expected of them during the feedback session and after.

5.5. Impact of the project on the organization

Implantation of a well-planned, needed educational change is crucial and vital for the college of medicine. Introducing TWFS, as an innovation, supports the college of medicine graduating students’ outcomes that characterized with critical thinking and lifelong learning. It has a positive impact on the college of medicine and so, on the university as a whole. The university will be capable to meet learners and community needs and can compete with the other universities.

Several authors had agreed the positive impact of implementation of a well-structured and timely feedback on college teaching, faculty development practice, as well as students’ achievements (Brookhart & Nitko, 2015; Evans, 2013; Huang, 2012; Westover & Hatton 2011)

Sustaining a culture of formative assessment and feedback during learning fulfills the recommendation of the accrediting bodies. The change also reflects on stakeholders’ satisfaction regarding the methods of teaching and the quality management, as well as having more competent graduates with up to date knowledge and excellent skills.
5.6. Project limitations

It should be mentioned that there are limitations to this research. First, the program was evaluated at the level I (reaction) to provide improvement, and it is clearly stated that positive response does not assure positive learning, but a negative reaction toward a program certainly decreases the likelihood of positive results in successive levels (Kirkpatrick, 1996). We need to be careful in understanding and translating the qualitative data and put in mind the distinction between a particular reality, students' thoughts of that reality and their message of these perceptions to the researcher. What students state in the focus group may be a biased, idealized, even possibly sneaking desire to simply get a grade and get on with their lives. This is not to be contemptuous to students who, like all of us, are often squeezed for time and have other commitments.

In addition, the change project was a pilot study that was introduced during a particular period to meet the demands of the dissertation. It also restricted to the anatomy as a subject. It needs more observation on the students' accomplishments and if they got direct benefits or not. But the time limitation of the project did not support for observing improvement in students' achievement. It also needs to be more widely implemented on the whole subjects.

5.7. Structure pattern proposed and Recommendations for future improvements

Change process is complicated and is overwhelmed with challenges and resistance. Implementing a change model enhances the likelihood of
successful change. There is no limit to the need for change, but a new cycle of change can arise after evaluating the first process.

The change cycle within the organization requires collaboration between managers and administrators within the organization, those coordinating the change and those targeted by the change.

Introducing and enhancing the process of feedback within the medical education is a challenge for all the people concerned with curricula preparation. Deficient timely and efficient feedback is notable within the researcher's organization and needs continuous monitoring and improvement. TWFS after formative assessment forms a start in the way of providing this timely and effective feedback, which demands the continuous engagement of the faculty and the students in the process.

The researcher suggested that each unit coordinator introduces TWFS in the middle of each semester after a well-prepared formative assessment. Although it is an additional task and extra work, but as mentioned before, it deserves this effort. This workload can be divided on the people from different disciplines and during the session all the faculty involved will be responsible for giving and receiving the feedback from the students. In the second half of the semester, it would be the time for analysis of the feedback achieved and implementing all the necessary changes that might come up. All the changes performed will be included in the units’ reports submitted at the end of the semester.
5.8. Conclusion

Feedback plays a fundamental role during learning. When effectively and timely introduced, it has a positive impact on students' progress, which might reflect on the students' achievement and so leads to more competent graduate. It also has a positive impact on the performance of the faculty and development of the curriculum.

The TWFS represented a change project, which had applied some of the principles of effective and timely feedback. It does heavily follow the strategic organizational goal of commitment to teaching excellence, and there are remarkable sufficient indicators for more future profit regarding improving the quality of students' learning. However, there is a need for future studies to ensure that feedback is implemented as part of the daily practice and to measure its direct effect on the students’ achievement with more caution to the students’ individual variations, opinions and motivations.

In this research, both faculty and students had a favorable opportunity to discuss their reflections on learning and examination processes and recommended the implementation of this process in different courses and units.
References
References:


Bell, J. D. (2015). Teaching and Fostering Change in the Classroom, Campus, and Community. Honors in Practice, 11, 173.


Mitchell, G. (2013). Selecting the best theory to implement planned change: Improving the workplace requires staff to be involved and innovations to be maintained. Gary Mitchell discusses the theories that can help achieve this. Nursing Management, 20(1), 32-37.


Appendices
Appendix 1: Curriculum Map (The red arrow indicates the timing of TWFS)
Appendix 2: Ethical Approval

College of Medicine

Ref: ERC[27]10[15]43
Tuesday, October 27, 2015

Dear Dr. Mohamed ELadl
Principal Investigator

Re: Ethical approval

Project Title: Implementation of a Two-Way Feedback During Learning Anatomy.

Researcher: Dr. Mohamed Eladl - College of Medicine - University of Sharjah.

I am pleased to let you know that the Ethics and Research Committee of the University of Sharjah has approved the recently submitted amendment of the above mentioned research project to be conducted at the College of Medicine - University of Sharjah.

It is the responsibility of the principle investigator to make sure that the study adheres to ethical standard and the study is conducted exactly as specified in the amended ethics application form.

Please provide us with final version of study protocol, questionnaire and consent form.

Any change to the design or methodology should be reported to the ERC for approval before implementing any change.

Please provide us with six monthly progress report starting from November 2015, the first report will be due in April 2016.

The ERC would like to wish you and the team all the best

Prof Nabil Sulaiman
Chairman, ERC
HOD, Family and Community Medicine and Behavioral Sciences
Appendix 3: Consent

College of Medicine

Consent form for participation in a scientific research project

WE KINDLY ASK THAT YOU READ THIS FORM VERY CAREFULLY AND FEEL FREE TO ASK ANY QUESTIONS YOU MAY HAVE BEFORE AGREEING TO BE PART OF THE STUDY

- You are being asked to take part in a research project aiming at: Implementation of a Two-Way Feedback During Learning Anatomy

- The project is conducted by: faculty members working at the College of medicine, the University of Sharjah.

- Your participation in this research study is voluntary. Your decision whether to or not to participate will not affect your current or future relations with your faculty. If you decide to participate, you are free to withdraw at any time without any consequences.

- What procedures are involved: Each participant will be asked to attend the formative assessment and the two way feedback session that will be introduced after the formative assessment and reflect on the learning process and the feedback session through the questionnaire and the focus group discussions.

- What about privacy and confidentiality: All information obtained from you will remain confidential; the research team will used a coding system where your name and personal information will be replaced by numbers so as to ensure full confidentiality. No information about you, or provided by you as a participant in this research project will be disclosed to any other entity (whether public or private) and for whatever reason unless they are directly involved in the named project.

- What are the potential risks and discomforts: No risks, physical or otherwise, can be foreseen.

- Are there benefits to taking part in the research: There is no direct benefit to you for your participation; however, we hope that the information to be obtained from this study will further improve our curriculum development process. This should hopefully contribute to the learning process and students’ achievements.

- Your Signature: I have read the above information. I have been given an opportunity to ask questions and my questions have been answered to my satisfaction. I agree to participate in this research. I have been given a copy of this form.

Printed Name: _______________________

Signature: ___________________________ Date: ___________________
## Appendix 4: Timetable

### College of Medicine Year 2 (Semester 3) 2015 – 2016

**WEEK 10 (15.11.2015 – 19.11.2015)**

<table>
<thead>
<tr>
<th>Time</th>
<th>SUNDAY 15.11.2015</th>
<th>MONDAY 16.11.2015</th>
<th>TUESDAY 17.11.2015</th>
<th>WEDNESDAY 18.11.2015</th>
<th>THURSDAY 19.11.2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>0800 – 0900</td>
<td>SELF DIRECTED LEARNING</td>
<td>Resource Sessions</td>
<td>SELF DIRECTED LEARNING</td>
<td>Resource Sessions</td>
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<tr>
<td>0900 – 1000</td>
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<tr>
<td>1000 – 1100</td>
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<tr>
<td>1100 – 1200</td>
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</tr>
<tr>
<td>1200 – 1300</td>
<td></td>
<td>Review session 12:30 – 02:00 L Hall 029</td>
<td>Anatomy Formative Assessment MCQ Group 1 12:00 – 01:00 L Hall 047</td>
<td>Anatomy Formative Assessment OSPE Group 2 12:00 – 01:00 Anatomy Lab</td>
<td>Hospital Visit</td>
</tr>
<tr>
<td>1300 – 1400</td>
<td>Compulsory Unit 12:30 – 02:00</td>
<td>Anatomy Formative Assessment OSPE Group 1 01:00 – 02:00 Anatomy Lab</td>
<td>Anatomy Formative Assessment MCQ Group 1 01:00 – 02:00 L Hall 047</td>
<td>Compulsory Unit 12:30 – 02:00</td>
<td></td>
</tr>
<tr>
<td>1400 – 1500</td>
<td>PBL – session 1 02:30 – 04:30</td>
<td>SELF DIRECTED LEARNING</td>
<td>Anatomy Formative Assessment MCQ Group 3 02:30 – 03:30 L Hall 047</td>
<td>Anatomy Formative Assessment OSPE Group 4 02:30 – 03:30 Anatomy Lab</td>
<td>Two-Way Feedback Session</td>
</tr>
<tr>
<td>1500 – 1600</td>
<td></td>
<td>SELF DIRECTED LEARNING</td>
<td>Anatomy Formative Assessment OSPE Group 3 03:30 – 04:30 Anatomy Lab</td>
<td>Anatomy Formative Assessment MCQ Group 4 02:30 – 03:30 L Hall 047</td>
<td>PBL – session 2</td>
</tr>
<tr>
<td>1600 – 1700</td>
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<td></td>
<td></td>
<td></td>
<td>Anatomists 02:30 – 04:30</td>
</tr>
</tbody>
</table>

1:00 – 03:00 L Hall 044
Appendix 5: Questionnaire

Student name (optional):

Thank you for taking the time to complete this evaluation form. Your feedback will help the college to continuously improve the educational program. Please complete and return the form to the unit coordinator.

Kindly tick the appropriate scores on the Likert scale.

Please indicate the extent to which you agree or disagree with the following statements.

(Rating scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree, 5 = Strongly Agree)

<table>
<thead>
<tr>
<th>Statement</th>
<th>1 Strongly disagree</th>
<th>2 Disagree</th>
<th>3 Uncertain</th>
<th>4 Agree</th>
<th>5 Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I enjoyed the session</td>
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<tr>
<td>The Time of the session was appropriate</td>
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<tr>
<td>The session has helped me to identify my strengths and weaknesses</td>
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<tr>
<td>The faculty has provided me with specific advice on how to improve my performance</td>
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<tr>
<td>The session promotes active reflection on the effectiveness of teaching.</td>
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<tr>
<td>The session encourages feedback that enhances learning.</td>
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<tr>
<td>Exam without marks prevents motivation for students cheating.</td>
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<tr>
<td>It is difficult to motivate students’ performance on exams without marks</td>
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<tr>
<td>Sharing the question analysis of the exam with the students was beneficial.</td>
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</tbody>
</table>
What did you like most in this session?

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Provide suggestions for improvement?

In teaching:
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In formative exam:
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In feedback session:
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Appendix 6: Focus group discussion themes and content Analysis

1) Themes:

A) General impression (The general reaction towards the two way feedback session & formative assessment)
   - How much did you enjoy the formative exam and the feedback session?
   - What about timing and arrangements of the session? How was the organization of the session?
   - Let me hear about any memorable story?

B) Specific points of discussion (Evaluation of the different components of the two-way feedback session; venue, personnel and impact on learning).
   - How do you evaluate the feedback given to you in the session?
   - Explain why? (if it went well or not)
   - Did the session allowed you to give your feedback properly?
   - Explain why? (if you did or not)
   - What about time of the session?
   - What is the impact of the session on your learning?
   - What did you like most?
   - State areas for improvement (your suggestions for improvement)
## 2) Focus group contents' analysis:

<table>
<thead>
<tr>
<th>Student 1 S1</th>
<th>Theme one General impression</th>
<th>Theme two Feedback Given by the faculty</th>
<th>Theme three Feedback given by the students</th>
<th>Theme five Impact of the session on the students’ learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>The session was <em>very well-organized</em> and the <em>timing was ok</em></td>
<td>I discovered that I am so week in identifying some important structures in the OSPE and the embryology needs more attention</td>
<td>&quot;When the exams have no marks, it gives us the opportunity to think freely without being afraid of the mark and results&quot;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Student 2 S2 | Although it is ideal to have this session after formative, I think it could be done without formative … we can only have a general demonstration of the outline of the exam. | "I discovered that I am so week in identifying some important structures in the OSPE and the embryology needs more attention" |

| Student 3 S3 | "I was so stressed to get the maximum benefits of the formative assessment" | Students’ comments on questions was helpful |

| Student 4 S4 | "The timing would be much more beneficial if it was done at the end of the semester to include all the final exam contents". | |

| Student 5 S5 | "I think this is the first time we feel that we will get benefits from our own feedback because of the timing of the session. The staff might listen to our feedback and do some modifications in the final exam” | |

<p>| Student 6 S6 | Replying to student 2, formative is a must to receive the feedback from the faculty | I couldn’t say any negative feedback in front of the faculty. I prefer writing my comments in an |</p>
<table>
<thead>
<tr>
<th>Student 7 S7</th>
<th>anonymous survey”</th>
<th>It is very good idea to get what are the answers of the whole batch. It is really supportive and motivating”</th>
<th>I know many students came to formative without studying…. there is no mark ….. they didn’t benefit from the formative !!”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student 8 S8</td>
<td>“Positive feedback given during learning is really encouraging; I think it deserves working hard”</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>