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INCORPORATING 'QUALITY-AUDIT' AT THE UNDERGRADUATE SCIENCE AND ENGINEERING CURRICULA

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ABSTRACT

This article defines the necessity to incorporate 'quality-audit' at the undergraduate science/engineering curricula based on the consideration of current declining trend of students' motivation and engagements in sciences, lack of social, business and technological implications with science, and to perceive science knowledge as useful, interesting, and relevant. A brief literature review is presented with syntheses, critical reflections and analyses on various aspects of quality-audit, their applications, limitations, recent changes on the perceptions and practices of quality-audit, and evaluations of the quality of performed quality-audit. The presented information and syntheses of literature are helpful to devise an effective 'quality-audit' unit-course for undergraduate science/engineering curricula where 'student-centred' and participative 'inquiry-based' learning approaches are suggested. A complete internal 'quality-audit' process with exemplary guidelines and instructions is demonstrated. Both theoretical and practical components of 'quality-audit' presented in this article complement to each other fulfilling the requirements of this unit-course. The article emphasizes the significance of 'quality-audit' study in higher education, suggests a blended approach of learning resources, and discusses teaching, learning, pedagogical and implicated issues related to 'quality-audit' for implementation and further improvements of the outlined course. The suggested 'quality-audit' unit-course focuses on the fundamental concepts and the functioning process of quality-audit, explains the operations of the quality system, associated critical issues, business consequences, continuous improvements, and enhancement of students' motivation and engagements to build confidence for easy accommodation in the workforce. It fosters team spirit and helps improve students' creativity, analytical skills, critical thinking, problem-solving and decision-making abilities. Students can learn critical issues of quality, achieve a higher awareness of social implications, find better applications of 'quality management' in business, and become well-informed future citizens taking their own responsibilities.

Keywords: Auditor/Auditee, Curricula, Pedagogy, Quality-Audit, Audit-Quality, Science, Engineering.

INTRODUCTION

Quality-audit is an essential component of 'Total Quality Management' (TQM), and a key management tool for effective implementation of the quality system. The paramount importance of quality-audit maintaining quality management system of any organization whether it be food safety (Kotsanopoulos and Arvanitoyannis, 2017), education (Kettunen, 2012) or health services (Brown, Santilli and Scott, 2015), is increasingly acknowledged. While the importance of quality-audit is increasingly acknowledged, however, at the same time,

the perceptions of quality-audit and the way it is practised are also constantly changing. In the recent past, the corporate scandals of 'Enron and Anderson collapse' (Arter & Russell, 2003; Chadegani, 2011) and 'Maryland General Hospital' issues (Ehrmeyer & Laessig, 2008) are creating considerable attention to both educators and quality management professionals for the necessity to critically look into the inherent drawbacks of traditional quality-audit processes, and associated factors that affect the validity of quality-audit process and audit-quality.

Quality-audit verifies and assesses all system elements i.e., procedures, processes, and people (Ingman, 1991). The purpose of quality-audit is to ensure total compliance of organization with a set of procedures and

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agreed standards. It contributes to the development of a quality system through continuous improvement and innovation and creates a problem-solving culture (Barthelemy & Zairi, 1994). A successful quality-audit always strives to effectively educate the workforce and prepares them to attain positive audit experiences (Wasche & Sciortino, 2007). Since the business of an organization is dependent on the quality of its process or product, thus it mostly relies on the decisions that are taken based on the outcomes derived from internal quality-audit (Goldberg & Shmilovici, 2005). The regulations or standards pertained to quality management system (QMS) demand an internal monitoring process that continuously strives to maintain compliance with regulations or standards (Wasche & Sciortino, 2007). Internal quality-auditing to ISO 9000 is an efficient tool for continuous improvement of the quality system. It offers enormous benefits and helps to implement an effective QMS (Taormina, 2000). Many organizations use compliance-audits as their internal monitoring system to determine whether group standards are in compliance with their QMS (Wasche & Sciortino, 2007). The ISO standard primarily focuses on the continuous improvement of quality where quality-auditing plays a critical role. Quality-audit greatly relies on the self-assessments of an audit that is based on ISO compliance standards. Despite the facts of providing benefits, quality-auditing has been mostly perceived in a negative manner, and hence questions are being raised as to how a quality-audit is conducted, who conducts audit, and findings of an audit (Beecroft, 1996).

In current situation the discipline-based curricula viz. science and engineering are constantly in demand of improvements because of the inability to understand the current practices and culture of science and technology, and for overlooking the necessity to integrate science and technology with relevant aspects of life such as, civic, work, personal, social, and economy. In a realistic perspective, it necessitates an effective science/engineering curriculum particularly for STEM education engaging students beyond the scope of discipline-based courses that are capable to meet their adaptive needs. As a result, students will be able to take their own decisions and make judgements with correct actions which involve the elements of risk, uncertainty, values and ethics (Hurd, 2000; 1998). Apparently, TQM is being taught in many undergraduate courses as a blended resource of science/engineering with the

business providing students with the opportunity to learn applied science. Since 'quality-audit' is a core and essential component of the quality management system (QMS) that concerns with an understanding of procedures, regulations and standards, hence it is necessary that 'quality-audit' is incorporated at the undergraduate science/engineering curricula. Although a broad spectrum of information on 'TQM' are readily available from various sources, courses and trainings or students acquire that knowledge from their existing blended resources of curricula, however, a little information on 'quality-audit' is presented to students in a systematic, organized and plausible manner that could warrant to gain academic merits benefitting students. Thus, the premise of this article covers all basic learning aspects of 'quality-audit' within a unit-course framework and discusses the importance, necessity, implications and practical applications of quality-audit.

The paper is articulated based on a range of research questions that capture all essential constituents required to devise a unit-course on 'quality-audit' and covers all pertinent teaching discourses. These research questions are addressed throughout the article.

- What basic information and standard procedure of a quality-audit process are required to devising a course on quality-audit that students should learn?
- To what extent the perceptions and the way quality-audit is practised are changing? Does it require an up-to-date knowledge and understanding that may contribute to the improvements of this course?
- Are the changing perceptions and the way quality-audit is practised have impacts on the fundamental basis of quality-audit principles?
- How is the quality of a performed audit (i.e., 'audit-quality') evaluated in the process of quality-audit?
- How can students learn quality-audit? What are the implications and benefits of learning quality-audit?
- What are the associated pedagogies, teaching techniques, and assessments would be appropriate for this course?
- What are the course outcomes?

This article comprises of three major parts. In the first part, a literature review is conducted on various type of quality-audits, their applications, limitations, recent changes and progresses on the perceptions and practices of quality-audit, and evaluations of the quality of the performed quality-audit. The discussions, syntheses,

critical analyses, and critical reflections of this review provides adequate baseline information that could be included into 'quality-audit' unit-course framework (section 2). In the second part, basic components of a quality-audit unit-course framework are discussed. It discusses the purposes of quality-audit, significance or benefits, various type of audits, their characteristics and necessities, and different parts being involved in an audit process (section 3). In the final part, a complete internal 'quality-audit' process has been devised for the practical part of the suggested quality-audit unit-course with exemplary guidelines and instructions. How students can clearly understand, learn, and perform a practical quality-audit are outlined. It also discusses teaching, learning, pedagogies and assessments associated with unit-course of quality-audit (section 4). It is suggested that at least one theoretical and one practical assignment are allocated for this unit-course. The practical assignment involves group-work where a project will be assigned to carry out a real internal 'quality-audit' preferably in an industrial context, and outside of the university. Both theoretical and practical assignments would involve in partial fulfilment of the requirements of proposed undergraduate unit-course.

LITERATURE REVIEW

'Quality-Audit' and 'Audit-Quality': In recent years the perceptions and the way quality management and quality-audit programs are practised have been changed. The evaluation of the quality of a performed quality-audit (audit-quality) is also a grey area that requires more attention. As the perceptions and practices of quality-audit are constantly changing, it certainly demands to change and improve existing curriculum. Thus, it is important that academics and curriculum developers know such changing aspects, and accordingly improve their existing 'quality-audit' curriculum, unit-course and teaching materials. Following 2 sub-sections present a literature review with discussions on the pertinent issues and provide syntheses and critical analyses with reflections on both 'quality-audit' and 'audit-quality'.

Quality-Audit: Quality-audit has been defined in ISO standard that provides opportunities for innovation, problem-solving and continuous improvement. The key concern is how and which way it is implemented. Quality-auditing can be effective if it becomes part of a continuous improvement process where quality is perceived as fundamental to each and every step of the

process (Ehrmeyer & Laessig, 2008). Beeler (1999) elaborated this issue further by addressing six striking features of a compliance-audit that creates negative perceptions of the audit. Beeler described that audits must achieve three fundamental goals such as quality, compliance, and confidence. Audits should be concerned with facts and focus on systems. Auditors should have the willingness to make judgements based on evidence they gather. Audits should focus on information gathering and analytical activities that contribute to continuous improvement allowing active involvement of process owner and employees. Internal quality-audit should translate the activities to respective line managers who can understand and appreciate. For a successful quality-audit, it should focus on systems, full-spectrum audits, reasoning, facts, system-based phenomena, critical thinking, draw conclusions, and make audit relevant to the success of the organization, report to management and, importantly make a partnership with line managers (Beeler, 1999).

The interviewing technique of quality-audit process is quite challenging. In order to be successful, all certified auditors should achieve this core competency. A recent report (2015) demonstrated that to obtain objective evidence of efficiency, effectiveness, and continual improvement, the Appreciative Inquiry (AI) is a powerful tool for forming and phrasing interview questions of quality-audit. AI method addresses a fundamental weakness of conformance- or compliance-based auditing by providing tools for an evaluation whether a QMS has been effectively implemented and maintained. AI audits help an organization in the identification of faults; employ forward-minded best practices and encourage continual improvement without sacrificing conformance to regulations or standards. However, for multiple reasons, AI does not fit well with the objective of a third-party certification, compliance, or any regulatory audits; nor does it fit with second-party audits for assessment or corrective action to be undertaken by the supplier (Posey, 2015, p.4-5).

Quality-audit can be effective if a proactive and positive culture is reinforced within organization although it is challenging and takes time for acceptance. Becroft (1996) suggested that quality-audit can be effective if it is renamed as 'review' process; and, management takes it as an opportunity to identify strengths, then seeks for improvements without restricting only to fixing problems. It should emphasize on examining process

rather than people. And workforce should regularly receive positive feedbacks that enhance their morale and motivation. In order to gain the most significant impact on driving quality improvement process, quality-audit should focus on prioritizing the findings (Beecroft, 1996). Quality-audit helps to uncover new opportunities and removes barriers that impede continuous improvement. It allows all participants to discuss their own experiences and results and helps eradicating any bureaucracy. An effective quality-audit should have strong commitments from top management providing new problem-solving knowledge for all and leave everyone with confidence and happy while fostering a sense of people development (viz. knowledge, wisdom, motivation, and action-orientation in mind) (Ingman, 1991).

An organization requires utilising different type and level of quality-audits based on the level of maturity. The highest level of audit (total audit) works as an instrument towards continuous improvements and ensures the detection of non-conformances. It encourages openness, influences on the acceptance of auditing as positive and to understand its importance; and, fosters teamwork with a spirit of cooperation toward a positive work-culture (Barthelemy & Zairi, 1994). Recently a different approach has been reported (2010) that involves continual internal quality-audit in implementing and certifying quality management system that covers supplier-readiness review with risk assessments, gap-audit analyses, and timeline. Knowledge of maturity level helps to prioritize audit implementations considering gap-audit results. After implementing internal quality-audit and gaining approval from customer, organization are then ready to achieve accreditation through a certification audit (Hernandez, 2010). Although it is a novel approach, but the proposed model contradicts with the proposition where an audit can be the driving force behind a useful process of corrective action rather than a sole contributor for continuous improvement (Beeler, 1999); and, from this perspective, it requires a rigorous validation for acceptance.

Teamwork and continuous improvement are the keystones of TQM (Koch, 2003). In this context, Bhatti and Awan (2004) discussed the significance of teamwork and working relationship that influence quality-audit and outcomes. In quality-audit the spirit of team-work where both auditors and auditees are

involved enormously impact on internal quality-audit and its outcomes on the achievement of a considerable reduction in rejection rate, non-conformity, cost, defects, and better ways of doing work while maintaining harmonious relationships with quality auditors and auditees (Bhatti & Awan, 2004).

It is of vital importance to look at how ISO standard organization recently reviewed prevailing quality audit discourses and then updated. Patel and Patel (2009) reported that when ISO standards were upgraded from series 1994 to 2000, audit focus was shifted from procedural adherence to standards and, towards the actual effectiveness of QMS through implementing QMS practice. Such a significant change attributes to and signifies the changing circumstances of quality-audit practices. The real value of exercising quality is continuous improvement of key processes that drive business, adds value to quality, and builds a knowledge-base for own organization, customers, and suppliers. Thus, ISO organization accordingly responded to this matter for the success of the business, and since then it has been trying to closely link between the process and the quality of end products (Ralphs, 1998). However, a published research (2004) revealed that fulfilment of the requirements of ISO standard is not helpful for particular companies with a high degree of maturity level achieving a greater competitiveness and business success. These researchers suggested to perform both compliance- and management-audit and then integrate them to achieve an economic value-added audit system (Pivka, 2004). As this research was involved with only software companies projecting a narrow focus, these outcomes need to be verified using other areas/processes and be validated for the acceptance of this claim. Moreover, this research may give rise to questions, particularly in the aspect of the certification system, which is basically based on compliance-audit process.

A process-based audit approach that was entirely shifted from traditional to functional-based management system was reported (1997), where management was able to identify and conform to necessary requirements of skills in the workforce. This approach fosters the viewpoint that 'audit stands for business improvement'. This type of audit does not report any non-conformances; it eliminates bundles of paper works, makes the report reader-friendly and, provides positive feedback to process owner and process team with

suggestions for potential improvements (Wharton, 1997). Another report (2005) suggested a logical model-based expert system of quality-auditing to classify the results of quality assurance auditing. In this context, these authors claimed it to be a valid concept, and an easy tool to implement (Goldberg & Shmilovici, 2005). The inherent limitation of this model is that, the proposed system requires regular updates and revisions of a necessary set of rules. Nevertheless, the above two approaches (1997 & 2005) are required to be verified with rigorous validation for acceptance and their effectiveness for real-life applications.

Attainment of operational excellence of organization depends on the maintenance of three basic building blocks such as establishment, communication, and assessment of its requirements. Both internal and external quality-audits play a significant role in assessing these factors (Bigelow, 2002). The regulatory bodies generally advice whether there is a lack of audit independence that may affect to gain corporate success in business (Ball, Tyler and Wells, 2015). Evidently, many employees who are involved in internal quality-auditing have a lack of understanding as to how audits are related to business; and as such, they do not realize that the experience of an internal quality-audit can lead to achieving significant benefits in the improvements of the process (Wasche & Sciortino, 2007). Many organizations have their own internal 'quality-audit' programs in place but these are not independent of their manufacturing units. This situation can significantly affect and limit the independence and objectivity of internal audit units when auditing of their own processes and quality systems are conducted and implemented. It also causes adversarial working relationships between assigned internal auditors and their co-workers or colleagues. Many organizations assign their employee to perform internal 'quality-audit' who has limited knowledge of standards and regulations associated with elements of the quality system. In order to overcome these pitfalls and maintain an operational excellence, it was suggested (2002) that an organization requires an independent audit department where auditor should not report to its manufacturing or quality departments. Alternatively, auditing service can be outsourced, and organization should regularly perform an audit by a reviewer of qualified, independent and certified professional from outside to obtain an unbiased assessment of organizational facilities, equipment,

processes and systems (Bigelow, 2002). However, it is difficult to afford a separate audit department for the small to medium type of businesses. In this case, outsourcing this service could be an alternate option.

Internal quality auditors quite often experience conflicts in playing their role, especially in public enterprises. These auditors experience a lack of independence, and members of audit committee often disturbingly exercise their weak power on internal audit function affecting the auditors involved who could apply their idealized conception of independence and purist governance principles to practice. Although internal quality auditors are strategic in managing conflicts, however their lack of independence and further, the audit committee that does not greatly support internal auditors' coping tactics at any stage of the audit process, makes audit function difficult. In understanding the role of an internal quality auditor, the question remains that whether an internal quality-auditing should be viewed as a management control rather than an audit function that considerably differs from external auditing (Roussy, 2015).

Any organization whether it is manufacturer or distributor of regulated products can be under scrutiny and may experience some unexpected regulatory audit or inspection. These sudden visits of regulatory personnel can be effectively managed to retain the control of such inspection if management knows their rights and rights of the investigator to be visited (Schnoll, 2014). It is important to know that regulatory authorities are generally critical and specific of internal quality audits. For example, during routine inspections, the Food and Drug Administration (FDA) does not review reports resulted from internal quality-audits. But it seeks written certification on some important issues such as audits have been conducted, documented, and whether any corrective actions have been implemented or not that were originated from the suggestions of previously performed internal quality-audits (Bigelow, 2002).

Audit-Quality: The evaluation of audit-quality is a debated issue, and it is less understood by many organizations (Knechel et al., 2013). Evaluation of audit-quality is an important measure that helps to understand the function of a quality-audit is effective for correcting errors or mistakes towards striving for continuous improvements. An audit is a knowledge-based professional service that produces uncertain and unobservable outcomes. Hence knowledge and expertise

of auditors are crucial to obtaining good quality-audit outcome as it depends on quality judgments of auditor during all stages of the audit process. Audit-quality is influenced by the characteristics inherent to audit process such as, risk assessments, analytical procedures, evaluation of audit evidence, understanding the inherent uncertainty of audit, and to appropriately adjust to unique conditions of the client (Knechel et al., 2013). The relationships between auditors and clients are complex, and these aspects have differing impacts on audit-quality. It is evident that person-to-person relations between lead audit partners and CEO of client firm undermine the independence of the auditor and reduce the quality of audit through impairment of audit independence. To gain an improved audit-quality, it was suggested to practice audit partner-rotation while maintaining a good relationship between auditors and clients. However, as the tenure of audit firm increases, the firm is engaged in auditing builds audit expertise, and as a result, an increase in audit-quality can be observed (Ball, Tyler and Wells, 2015).

Mandatory audit-firm rotation rule, which has been recognized over the last two decades, plays an important role in the achievement of quality outcomes of the performed audit. Recently Cameron and co-workers (2016) examined in an Italian context as to how audit-quality changes during the period of engagement of audit firm. Auditors are generally appointed for a three-year period, and their term can be renewed twice up to a maximum of nine years while providing incentives to be re-appointed at the end of first and second three-year periods. Based on considering costs and benefits, their study revealed that when auditors are engaged for three consecutive terms, then these auditors become more conservative during the period of last three-year term that considerably affects the quality of the audit. In the years preceding the end of the mandate, the engaged audit firms consider litigation of risk issues and their chance of further engagements or be replaced. However, in the last term, they are more free and far from gaining any constraints, which effectively influence their quality of delivering audit services.

Partner-rotation and audit-inspection are two regulations being implied to enhance audit-quality. In partner-rotation, both positive and negative views are observed. Some researchers claimed that rotation practice enhances audit-quality while other researchers view the opposite. Moreover, it is difficult to measure the

impact of rotation on audit-quality while controlling the tenure of an audit team, and due to this audit practice, all audit data are not always clearly observable. On the other hand, audit-inspection can create a need for the engaged audit firms to demonstrate the effectiveness of their control systems that lead to improving audit-quality. However, audit-inspection has limited evidence of enhancing the quality of performed quality-audit (Moroney, 2016).

There is a debated issue whether the quality of the audit is affected by size, experience, and reputation of the engaged audit firm or not. In this regard, DeAngelo (1981) argued that when incumbent auditors can earn client-specific quasi-rents, then audit-quality is not independent of the size of audit firm even though auditors of small audit firms initially possess identical technological capabilities like large audit firms. Based on the study of audit-quality performed in financial organizations, Al-Khaddash, Al Nawas and Ramadan (2013) found various important factors within the Jordanian commercial banks that affected the quality of the audit. These authors reported that a positive and significant correlation existed between audit-quality and audit efficiency, the reputation of audit office, auditing fees, size of the audit firm, and proficiency of quality auditor. However, no discernible difference was found in audit-quality both for internal and external auditors engaged in the audit process.

Recently the framework of audit-quality was defined (2015) based on an input-process-outcome approach. Internal audit-quality was investigated through an internal audit process, internal audit input, and types of Internal Controls Deficiencies (ICD). Based on the private data that were collected in response to questionnaires and performed logistic regressions, it was revealed that the improvement of planning, scoping, testing, monitoring quality, competences and independence reduced ICD severity; and deficiencies and material weaknesses were significantly decreased and, reduced the persistence of ICD over period of time (Mazza & Azzali, 2015). In another report, Coleman (2015) described that performance of quality-audit can be evaluated with a standardized approach using a devised evaluation form. The obtained scores from the evaluation can be applied to 'Noriaki Kano' model to ascertain whether quality-audit program satisfies the needs of organization. It can track down the status of audit programs and effectiveness of implemented

improvements. Both pre-improvement and post-improvement evaluations are required to measure the performance of the quality-audit program. The evaluation form assesses critical areas of the audit program and precisely allocates the base scores to complete that evaluation. In this instance, audit planning is allocated 40% of base score; reporting, records and data analysis account for 30% score; and, remaining 30% scores are devoted to implementation and results related to adequate resources, organizational structure, variability, and breadth of impact of audit programs (Coleman, 2015). This standardized approach that aims for the evaluation of quality-audit program requires being verified by implementing in a variety of organizations as there might be other factors that have not been considered. Future implementation of this approach may lead us to know whether any missing factors will require to be re-incorporated for a rigorous assessment or not. This is because if those missing factors are not considered, it is the likelihood that it may impede expected evaluation.

REVIEW SUMMARY

It is evident that the perception and the way 'quality-audit' is practised vary considerably because of the nature of business practices, different maturity levels and modus operandi, work cultures, management styles and leadership practices, and these variations are observed from one organization to another. However, the fundamental objectives of quality-auditing are similar as these are reflected in every case presented i.e., determine conformity or nonconformity of quality system elements with specified requirements; effectiveness of implemented quality system to meet specified quality objectives; provide auditee an opportunity to improve quality system; and, meet regulatory requirements (North Point Institute of TAFE, 1996). Due to a lack of independence, auditors are likely to experience conflicts in playing their roles in internal 'quality-auditing' that may affect relationships with peers. A range of measures are suggested to evaluate 'audit-quality' of performed 'quality-audit'. The complex nature and mode of maintaining relationships between auditors and clients impact on 'audit-quality'. Mandatory audit-firm rotation practice may be effective in gaining quality outcome from performed quality-audit.

FRAMEWORK OF 'QUALITY-AUDIT' UNIT-COURSE AT UNDERGRADUATE SCIENCE/ENGINEERING CURRICULA
Quality-audit stands for finding facts, not faults; and,

plays a critical role in understanding the effectiveness of the quality system that strongly influences the business of that organization. Quality-audit verifies existing quality system whether the system is effectively functioning or not. Through internal quality-audit various faults and unnecessary practices could be uncovered, and hence organization gains an opportunity for further improvements. Thus, a clear understanding of a structured approach to quality-audit process and appropriate training of audit personnel are key factors to verify the effective implementation of any quality system and to identify areas of waste, neglect and duplication or wrongdoing within that organization (North Point Institute of TAFE, 1996).

The syntheses and analyses of relevant literature on 'quality-audit' and 'audit-quality' presented in section 2 can be helpful in devising a basic unit-course framework of 'quality-audit' at the undergraduate level. Basic information and standard procedure of a quality-audit process that students should learn need to be incorporated into theoretical course contents, and these are briefly described here. In fact, the compelling reason for presenting 'quality-audit' course-outline in a simple and basic format underlies the fact that, students can learn the fundamentals of quality-audit and its practices both theoretically and practically. The theoretical assignment will be based on the lectures, teaching materials and references presented in the classroom. This will help students understanding various perspectives of quality-audit, audit-quality, implications, significances, and applications. Subsequently, students will be able to gain hands-on and minds-on experiences in different or new perspective through the practical assignment as they will perform a practical audit on internal 'quality-audit' outside of the university. It is very important that teachers and educators constantly strive for the improvement of their unit-course design, resource materials, information and course implementation, and most importantly emphasize on students' learning outcomes from their delivered course. Quality-audit falls into three categories (North Point Institute of TAFE, 1996; Wood, 1994):

- *Internal Quality-Audit*, is carried out to evaluate organization's own performance and is called a First-party audit.
- *External Quality-Audit*, is carried out to evaluate the activities of suppliers, subcontractors, agents, licensees, etc., and is called a Second-party audit.

- *Extrinsic Quality-Audit* is carried out either by a customer or a third-party organization or a regulatory authority to assess organization's quality standard against the specific requirements and is termed as Second- and Third-party audit.

In terms of the depth of audit requirements, quality-audit falls into two types:

- *System Audit*, which determines the existence and validity of the quality system. A system-audit activity is confined only in the area of 'Quality Assurance Manual' of the organization. This audit does not concern to whether organization complies with a system. It rather concentrates to find out whether management has developed the system or not that requires to fulfil contractual and legal obligations.
- *Compliance Audit* ascertains whether a procedure or work instruction is properly implemented or not and measures its effectiveness. It is a deeper quality-audit and is confined to the area of quality procedures, and work instructions. While carrying out an audit, auditor seeks 'objective evidence'.

The basic purposes that necessitate to carry out quality-audit are:

- Determine conformity and nonconformity of quality-system elements.
- Determine the effectiveness of an implemented quality-system.
- Meet regulatory requirements.

The key benefits that an organization can gain from 'quality-audit' practices are:

- Obtain factual information that helps management to take appropriate decisions.
- Identify areas of opportunity for improvements and ascertain factual information if the organization is at risk in business.
- Improve motivation and communications across the organization.
- Assess the status and capability of company's equipment and skill-sets to leverage business and gain competitive advantage.

The process of 'quality-audit' has four defined and distinct phases:

- Planning and preparation part
- Performing audit
- Reporting on audit
- Following up audit findings

These four phases of 'quality-audit' process are discussed in the following section.

PEDAGOGIES AND TEACHING DISCOURSES ENCOMPASSING 'QUALITY-AUDIT' UNIT-COURSE

Effective learning of students can only occur when each individual can construct their own understandings (McInerney & McInerney, 2010). The 'student-centred' and participative 'inquiry-based' learning approach can be successfully applied to 'quality-audit' teaching where students can gain correct explanations, develop their scientific knowledge and skills, understand the nature and structure of content knowledge, and importantly, students are assisted in their intellectual growth and development. Thus, teachers must know and use content knowledge in a variety of ways to motivate that make 'quality-audit' interesting to students. Teachers should provide adequate support responsive to the needs of students, help facilitate students' understanding, and provide a challenge for them. In this respect, Seago (2009) demonstrated that when a participative inquiry-based learning approach was introduced within the same student groups, there were significant improvements in both interactions and integrative friendships among peers. Students came up with reasonable explanations, identified the differences of expected and achieved results with errors; students made their own judgements and felt confident (Seago, 2009). 'Student-centred' and participative 'inquiry-based' learning enhances students' motivation and engagements (Ewing, 2010; Smith, Danforth, and Nice, 2005; McInerney & McInerney, 2010) and, provide positive outcomes from students' learning.

This article suggests that at least a theoretical and a practical assignment are included in the proposed undergraduate unit-course of 'quality-audit'. The theoretical assignment will involve theoretical course contents such as theories, models, case studies, and various regulatory requirements where students will individually learn and respond. The theoretical assignment will help teachers to ascertain students' theoretical understanding of 'quality-audit', and implicated issues surround quality-audit and audit-quality, and various aspects of the functioning process. Consequently, students will participate in groups to carry out a practical assignment on internal 'quality-audit' in an industrial context and gain hands-on and minds-on capability of 'quality-audit' practices. The objectives, course outcomes and pedagogical approach are presented through a flowchart in figure 1.

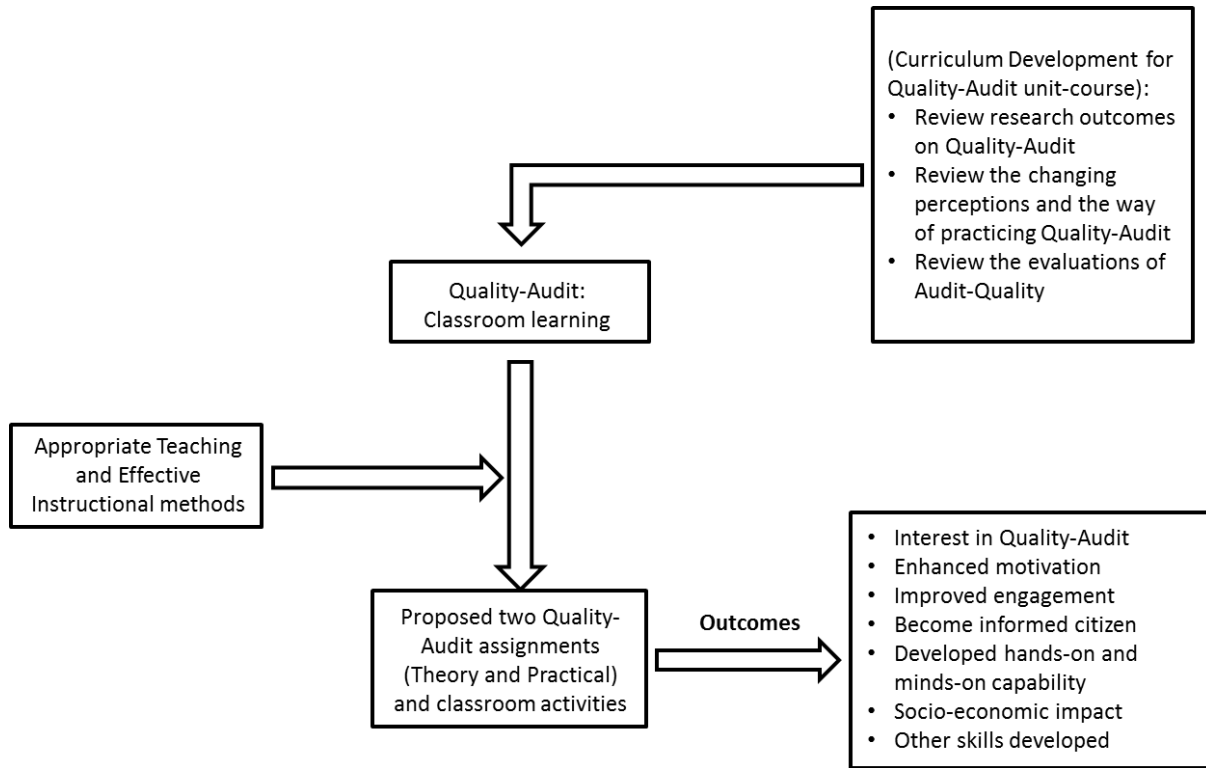


Figure 1. Objectives, course outcomes and pedagogical approach of ‘quality-audit’ unit-course at the undergraduate science/engineering curricula.

An effective quality-audit process (North Point Institute of TAFE, 1996) is briefly illustrated below. This provides a brief overview of an entire ‘quality-audit’ process. It also provides a general guideline to students about the working procedures as to how a ‘quality-audit’ is to be performed.

Planning and Preparation Part: Quality Manager of organization (auditee) has a responsibility to develop an audit schedule, and management will authorize the schedule that supports audit process. Quality Manager shall then prepare audit plan by selecting an auditor and advise auditor of the scopes and depth of audit. In case of internal ‘quality-audit’, a qualified staff will be selected from the same organization. For an effective outcome of ‘quality-audit’, Quality Manager and auditor should consider following points during the course of implementing planned process:

- Audit scopes and objectives; and, identify personnel to delegate significant responsibilities.
- Identify and review reference documents such as procedures, work instructions, relevant specifications, previous audit reports, and contract documents.

- Brief audit personnel or audit team.
- Identify organizational unit/s to be audited; dates and place where audit will take place and expected time and duration for specific audit.
- Prepare a checklist based on the documents to be reviewed, and procedures and work instructions that are to be assessed. The auditor should always strive for simplicity, clarity, and completeness whilst preparing audit checklist.
- Audit meetings need to be held with auditee’s management and should maintain confidentiality.
- Before audit starts, distribution of audit report and expected date of the issue needs to be clearly defined.

Performing Quality-Audit: An opening or entry meeting takes place at the beginning of ‘quality-audit’. The purposes of the opening meeting are:

- Introduce members of audit team to auditee.
- Review scopes and objectives of quality-audit to be performed.
- Provide a short summary of methods and procedures to be used in the audit.

- Confirm resources and facilities that are available for audit.
- Clarify any details which may be unclear.
- Confirm time and date for closing or exit meeting.

Auditor/audit team then commences audit using their pre-prepared checklist. Auditor collects evidence of compliance with the requirements of the standard through interviews; examines documents and observes activities and conditions in the areas of concern. Whilst undertaking interviews and questioning staff's auditor should be careful about the appropriate style of conversations.

Auditor will take notes on various observations including any clues that suggest non-conformances and apparently seem to be significant even though they are not covered in checklist; and, then investigates these later for confirmation. Whilst auditor gathers information through interviews, he/she will cross-check or test them by acquiring same information from other sources such as physical observations, measurements, and records. Auditor will write down any comments in the column designated for remarks of the checklist. If auditor makes any changes to audit such as audit arrangements and audit itinerary, it should be made in agreement with auditee. If the auditor finds audit objectives appear as unattainable, he/she can abort audit, and report the reasons to auditee's management.

After completion of quality-audit, and before closing-meeting, the audit team will sit down together and analyze all their written remarks and evaluate objective evidence that they obtained. Audit team critically analyze all minor and major non-conformances and evaluate the severity of their findings that can affect the quality of the system under investigation.

Any isolated incident of a non-conformance which has no direct consequential effect on quality of product or service should be considered as 'minor non-conformance'. In this case, it will be considered as 'needs improvement'. Normally, if three or more minor non-conformances are found within same element or procedure, it could lead to a 'major non-conformance'. A major non-conformance refers to an element of standard that has not been adequately addressed or it is an activity in direct contravention of a procedure that can significantly affect the quality of product or service. In quality-audit, any major non-conformance is unacceptable, and it must be reported.

The auditor will record severe or major audit findings on a Corrective Action Request (CAR) form and refer them

to an applicable item in standard or procedure. Only the nature of non-conformance should be recorded on CAR. Whilst writing up non-conformance, the auditor needs to address following points:

- Rewrite the statement or clause from standard or procedure that non-conformance refers to.
- Clearly outline the observation. For example, "the laboratory technician has not been trained or instructed properly in the sampling of materials..."

At this stage of quality-audit, "Corrective action", "Action was taken to prevent recurrence", and "Follow-up and close-out" sections of a non-conformance in CAR report should be left blank.

At the end of quality-audit and, prior to preparation of audit report, auditor or audit team and auditee sit down for a closing and exit meeting. Auditor presents audit findings to auditee with explanations so that auditee understands audit results. The auditor will advise auditee of an intended issue date of the audit report, and requests to respond to the findings of that performed quality-audit. The process time involving delivery of a quality-audit report from an auditor and responds from an auditee should normally complete within twenty working days. It is a standard practice that the auditor will attach the originals of CARs to quality-audit report. And in response, auditee will return the originals of CARs to auditor addressing necessary corrective or preventive actions that had been taken to eliminate the deficiencies or errors reported.

Reporting on Quality-Audit: While preparing a quality-audit report, the auditor should reflect on the contents of quality-audit and closing meeting. The quality-audit report should cover following contents:

- Audit report number, date and place of quality-audit, names of an audit team or auditor; reference to any previous audits.
- Audited department or section with contact person's name.
- Audit scopes with document identification.
- A summary of audit results.
- A list of all non-conformances and observations.
- Distribution list of the audit report.

The following documents need to be attached to quality-audit report:

- A covering letter which includes an expected response date for any Corrective Action Requests (CAR).
- Any CAR form duly filled in and signed.

Quality-audit report must be signed by auditor and Quality Manager of the auditee. After completion of quality-audit, the report should be issued as soon as practicable. At this stage, upon submission of the quality-audit report to management, quality-audit is deemed to be complete.

Following-up Quality-Audit Findings: Auditee has a responsibility to determine and initiate corrective actions to correct nonconformity or cause of nonconformity. In this case, the auditor is only responsible for identifying any nonconformity.

Once corrective and preventive actions are completed, auditee records these actions in the appropriate section of CAR form and returns a copy to Quality Manager. Quality Manager then reviews the nominated corrective and preventive actions, nominates a proposed follow-up date, updates the CAR Status Log, and notifies the auditor of the proposed corrective and preventive actions. In nominating the date for a follow-up, Quality Manager may decide the next scheduled audit date if the issue is not critical or prior to next scheduled audit date if the issue is critical.

At the date of follow-up, an auditor assigned by Quality Manager follows up and verifies if the undertaken corrective or preventive actions are effective enough to fix the original problem. If the follow-up efforts prove to be satisfactory, the auditor shall close out CAR and Status Log. However, if the follow-up shows that the original problem still persists and was not corrected, then auditor will close out original CAR, and raise a new CAR referencing the old CAR. In any situation, if auditee continually fails to take effective action for correcting problem, the matter needs to be directly referred to management of auditee. In consultation with auditor auditee's management should agree to a time frame for completion of a corrective action, and subsequent follow-up audits.

Continuous improvement of existing quality system is fundamental to maintain the standard of quality. No organization can gain a competitive edge in business without their efforts of continuous improvement. An organization strives to improve their quality system based on four steps of quality audit process by correcting faults and implementing suggestions derived from quality-audit outcomes. The following schematic flow-chart shown in figure 2 exhibits a distinct loop being implied for continuous improvement of an existing quality system through quality-audit, in general, where

four steps of the quality-audit process are depicted.

The schematic diagram presented (figure 2) provides a general overview for an understanding of continuous improvement, quality-audit process, implications and significance of quality-audit that distinctly helps maintain the standard and, for further improvement of quality, 'quality-audit' unit-course, for example.

Performing internal 'quality-audit' in an industrial setting outside of university helps to gain an enhanced effectiveness of students' learning of 'quality-audit'. Teachers may select any quality standard (viz. ISO 9001-3, ISO 17025) for assignment, and target a specific industry to perform the practical audit. In the classroom, the teacher may outline the activities that are involved in quality-audit process and explain how students can benefit from that auditing. It is imperative that before planning a visit to industry, variable attitudinal aspects, students' expectations, students' preparation, and expected cognitive outcomes are carefully considered.

Prior to visiting an industry, the teacher may provide all relevant information to students that create a 'broader picture' rather than a discrete or partial view. This will allow students to look into both macroscopic and microscopic point of views. Teachers may decide which area will be targeted to conduct an audit, i.e., product, process, functional or operational areas. On this matter, teachers can engage students in discussion to reach a consensus. A myriad range of areas can be selected for quality-auditing. It entirely depends on teachers and students, and relevant to the area of studies. Patel and Patel (2009) provided a list of important areas for internal 'quality-audit' that applies to various disciplines. For example, chemistry students may select the areas of 'weighing and measuring equipment of suitable accuracy' or 'calibration of critical equipment and instruments' or 'specifications, sampling and testing procedures' (Patel & Patel, 2009).

Teachers may guide students to find relevant information on the particular section of the standard that to be audited and relevant references. Accordingly, students will be engaged in searching information through various sources and from past theoretical lectures from academics. Students will decide through peer discussions as to how they can perform and what activities will be involved in their 'quality-audit'. Prior to an industrial site visit making a list of questions for students would be useful.

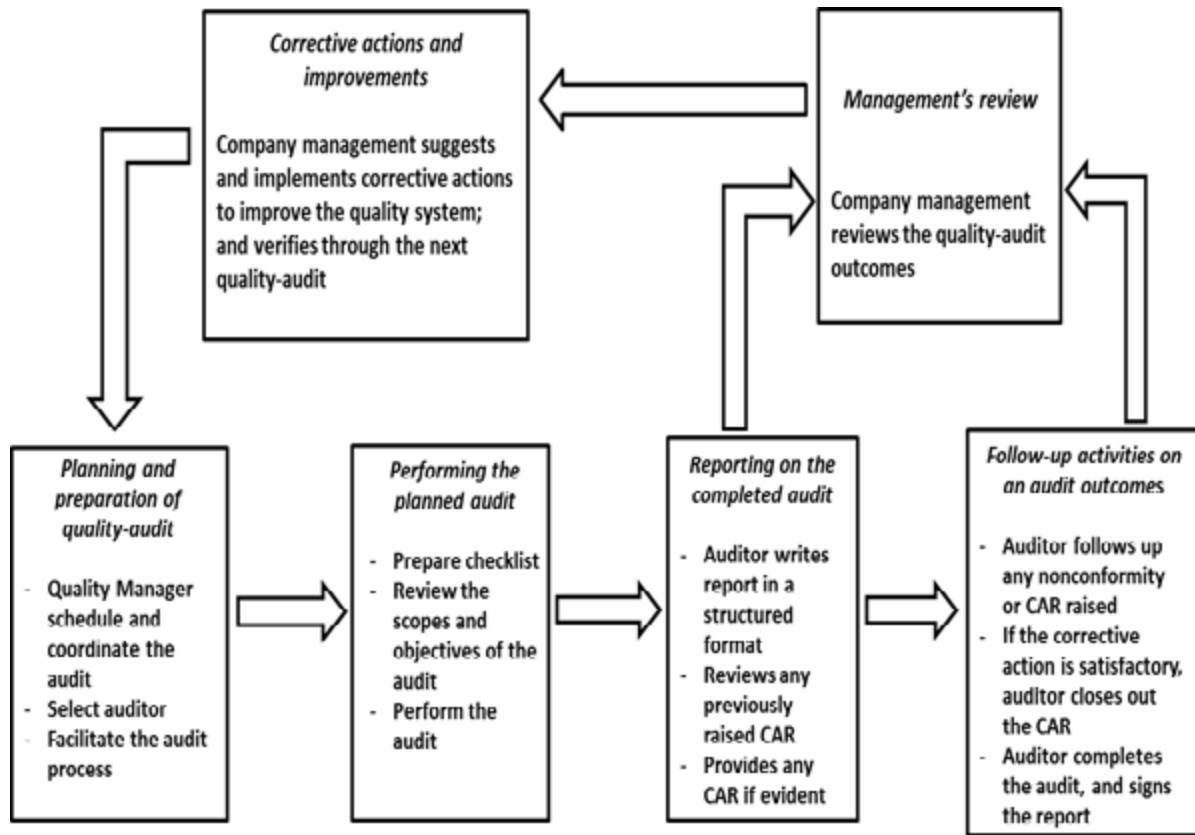


Figure 2. A loop for continuous improvement of quality system through 'quality-audit' process.

Teachers should always guide students as a facilitator towards the right direction that appropriately facilitates students' planning, preparation and audit activities.

After completing quality-audit, the teacher may ask students to examine and cross-check their performed 'quality-audit' through discussions among peers and reflect upon their experiences gained from the audit. The teacher may instigate and allow students to involve in discussions and ask questions. The teacher may ask some leading questions to students relevant to audit activities. Such interactive process can facilitate to involve students in 'inquiry-based' and 'student-centred' learning activities and help summarize their performed quality-audit. The teacher may then request a written quality-audit report. The teacher should guide students in their preparation of the report; demonstrate how students can structure their audit report, organize, link, integrate, and communicate their own ideas and peer discussions; and express in a nice, structured and presentable format which would involve critical reflections, critical thinking, analyses, and own judgements. In order to facilitate students' report writing, two general but structured reports (table 1 and table 2) are

presented. This demonstration will provide a general guideline as to how students should write their reports after performing an internal 'quality-audit'. Students may choose to re-design their reports/formats without compromising or changing any essential criteria that to be present in the report.

A range of assessments suitable for science and engineering courses can be applied to this unit-course of 'quality-audit' such as continuous assessment with formative feedbacks (Williams, Johnson, Peters, and Cormack 1999), standard or criterion-referenced assessments (Brady and Kennedy 2012), classroom-based assessment, and self-assessment by peers. Despite the fact that standard or criterion-referenced assessments are most popular (Brady and Kennedy 2012) however, teachers may intend to shift to a more authentic and flexible-approach which entirely depends on the choice of teachers. The values, merits and practices of authentic assessment depend on the culture of the classroom, school/institution, pedagogical approaches, expectations, standards of performances, and capabilities of students' self-critical judgement (Williams, Johnson, Peters, and Cormack 1999).

Table 1. An Example of 'Quality-Audit' Report.

Audit Report	
<i>Audit Number:</i>	<i>Audit Date:</i>
<i>Elements of standard audited:</i> Control of inspection, measuring and test equipment (section 4.11, ISO 9002) including relevant procedures and work instructions.	
<i>Previous Audit details:</i> Date: xx/xx/xx No CAR was raised	
<i>Contact person:</i> Robert Langmuir	
<p><i>Summary of Audit:</i> The Audit at Australian Chemical Company, 503 Langford Street, Bankstown, Melbourne, was conducted on Monday 5th February 2018.</p> <p>The Auditor was Thomas Ashfield and the auditee was Robert Langmuir assisted by Martin Thompson.</p> <p>The audit went well, and Robert and Martin were very co-operative and able to show required objective evidence quickly without any fuss.</p> <p>There were no non-conformance and corrective action requests to be raised. However, three observations were made. It was noticed that:</p> <p style="padding-left: 40px;">Section 4.11.2 (d) – Calibration status – a scheduled calibration work was not completed in due course. This practice needs improvement.</p> <p style="padding-left: 40px;">Section 4.11.2 (f) – Assessment and document the validation of previous work – there were no benchmarks on such assessment or validation, which could make a contribution to cost savings.</p> <p style="padding-left: 40px;">Section 4.11.2 (g) – Ensure the environmental conditions – there was no evaluation or evidence that could support to ensure those conditions.</p>	
<i>Non-conformance and Corrective Action Report (CAR) issued:</i>	Nil
<p>Auditor: _____</p> <p>Date: _____</p> <p>Auditee: Australian Chemical Company</p> <p>Quality Manager: _____</p> <p>Date: _____</p>	

Note: Names of auditor, company and auditee; address and dates are used as pseudonyms.

Table 2. An Example of 'Quality-Audit' Corrective Action Report (CAR).

Corrective Action Report (CAR)			
Australian Chemical Company CAR No.: _____			
Customer/Supplier Name: Australian Laboratory Calibration Services Date: xx/xx/xx Product or service description: Top pan balances for sample weighing			
Purchase order No. N/A	Job No. N/A	Audit Report No. N/A	Types of Non-conformance <input type="checkbox"/> Material/Product Non-conformance <input type="checkbox"/> Recurring Non-conformance <input type="checkbox"/> Audit review Non-conformance <input type="checkbox"/> Customer complaint
Procedure Audited: N/A			
<p><i>Description of Non-conformance:</i> Clause xx of Australian Chemical Company procedure xxxx states that calibrations shall be conducted by approved organizations to national or international standards. For example, there was no evidence that two top pan balances (serial no. xxxx and xxxx) were sent away for calibrations on xx/xx/xx and returned on xx/xx/xx with no known relationship to a national or international standard.</p> <p>Raised by: _____ Date: _____</p>			
CAR referred to: Australian Laboratory Calibration Services		Category: Needs improvement <input type="checkbox"/> Unacceptable <input checked="" type="checkbox"/>	
<p>Immediate action to be taken:</p> <p>Disposition <input type="checkbox"/> Scrap <input type="checkbox"/> Rework <input type="checkbox"/> Use as is <input type="checkbox"/> Returned <input type="checkbox"/> Re-inspected <input type="checkbox"/> Other</p> <p>By when: _____ Signed: _____</p>			
<p>Action was taken to prevent recurrence:</p> <p>By when: _____ Signed: _____</p>			
<p>Follow-up details:</p> <p>Signed: _____ Date closed out: _____</p>			

Note: Names of auditor, company and auditee; address and dates are used as pseudonyms.

During the assessment, teachers should be aware of shortcomings that, students may drift from their focus on main objectives of quality-audit assignment, which may cause difficulties in marking or assessment. To avoid such possibilities, teachers may prepare and follow their assessment rubrics and explain to students beforehand. The assessment rubrics can help students in preparation of a creative quality-audit report and write their

assignments. It also helps students to conceptualize, categorize and interpret their understanding through creative way, and acquire a thinking capability in a structured and logical way to express. In order to facilitate teachers' assessments, a structured assessment rubrics are presented in table 3. This rubrics will provide a guideline that teachers may follow or they may articulate their own assessment rubrics.

Table 3. An Example of ‘Assessment Rubrics’ for Undergraduate ‘Quality-Audit’ Unit-Course.

Student Name: _____ Grade: _____

Criteria	D	C	P	N
Clear understanding of theory and quality-audit process 30%	Carefully reasoned theory and quality-audit process, thoughtfully and accurately referenced	Reasoned theory and quality-audit practices well, and clearly referenced	Lacks understanding theory and quality-audit practices, lacks evidence of understanding, clear and accurate referencing	Lacks cohesion and not adequately supported by sound reasoning. Lacks evidence of understanding the requirements raised in assignment
Intellectual engagements with unit-course materials 25%	Insightful engagement with unit-course materials, strong evidence of relevant reading and research beyond the scope of unit-course materials	Evidence of thoughtful and sound engagement with unit-course materials and other relevant references	Little or ineffective engagement with unit materials and relevant wider readings	No effective engagement with unit-course materials and/or irrelevant wider readings
Group activity and critical reflection 25%	Display excellent team behaviour, thoughtful and insightful reflection on quality-audit process involved, deep engagement in critical self-awareness	Display good team behaviour, reflection on quality-audit process clearly articulated, evidence of thoughtful and critical self-awareness	Satisfactory team behaviour, limited reflection in scope and failing to provide evidence of the understanding quality-audit process. Limited evidence of self-awareness	Unsatisfactory team behaviour, lacks evidence of critical self-awareness related to issues and aims raised in assignment
Overall academic structure and presentation of report 20%	Outstanding, using language that reflects a thoughtful engagement with the materials chosen. Few or no errors in punctuation, spelling and grammar; relevant and consistent academic style chosen for communication of ideas	Excellent presentation using effective and accurate language to clearly express ideas. Few errors in punctuation, spelling and grammar; inappropriate and/or inconsistent academic style	Satisfactory language, lacking precision affecting the clarity of ideas. Errors in punctuation, spelling and grammar. Inappropriate and/or inconsistent academic style	Inappropriate or careless language that fails to clearly communicate ideas. Very poor punctuation, spelling and grammar. Lacks academic rigour
D	= Distinction (75% +)	P	= Pass (50% - 59%)	
C	= Competent (60% - 74%)	N	= Not Pass	

A dual-mode of scaffolding technique can be effective for a practical assignment on internal 'quality-audit'. In that case, first, the teacher can guide students to Web-sites or other resources about the selected topics to be audited or show videos to students on these topics if available. Second, the other technique in a practical sense is to provide the hands-on and minds-on experience of learning quality-audit. For example, the teacher may devise a plan to conduct a quality-audit within the faculty environment. The benefit of such approach is that when students will carry out their practical audit assignment outside of the university, they can then comprehend and reflect upon the contextual differences of both quality-audit processes and outcomes.

It is also possible to carry out such assignment without visiting an industrial site. Industrial sites may not be easily accessible or located far from university or the visit may have to be unexpectedly postponed or interrupted.

Hence, the teacher can articulate and devise an alternative or contingency plan should the situation arise. In this case, the teacher may choose to carry out the assignment within the campus choosing the right place for students.

Finally, Teachers and educators should always focus on the improvement of students' learning experiences during their study of quality-audit. In order to improve the quality of this unit-course and to enhance students' learning, the Plan-Do-Check-Act (PDCA) approach (Wood, 1994) can be successfully implied to design, develop, implement, and further improve the unit-course. The schematic diagram of PDCA cycle of 'quality-audit' unit-course and the anticipated actions for each cycle element are described in figure 3. This PDCA cycle covers defining course objectives and course materials, course outlines, how the efficacy of 'quality-audit' unit-course can be evaluated, and how continuous improvement of the quality of the unit-course can be performed.

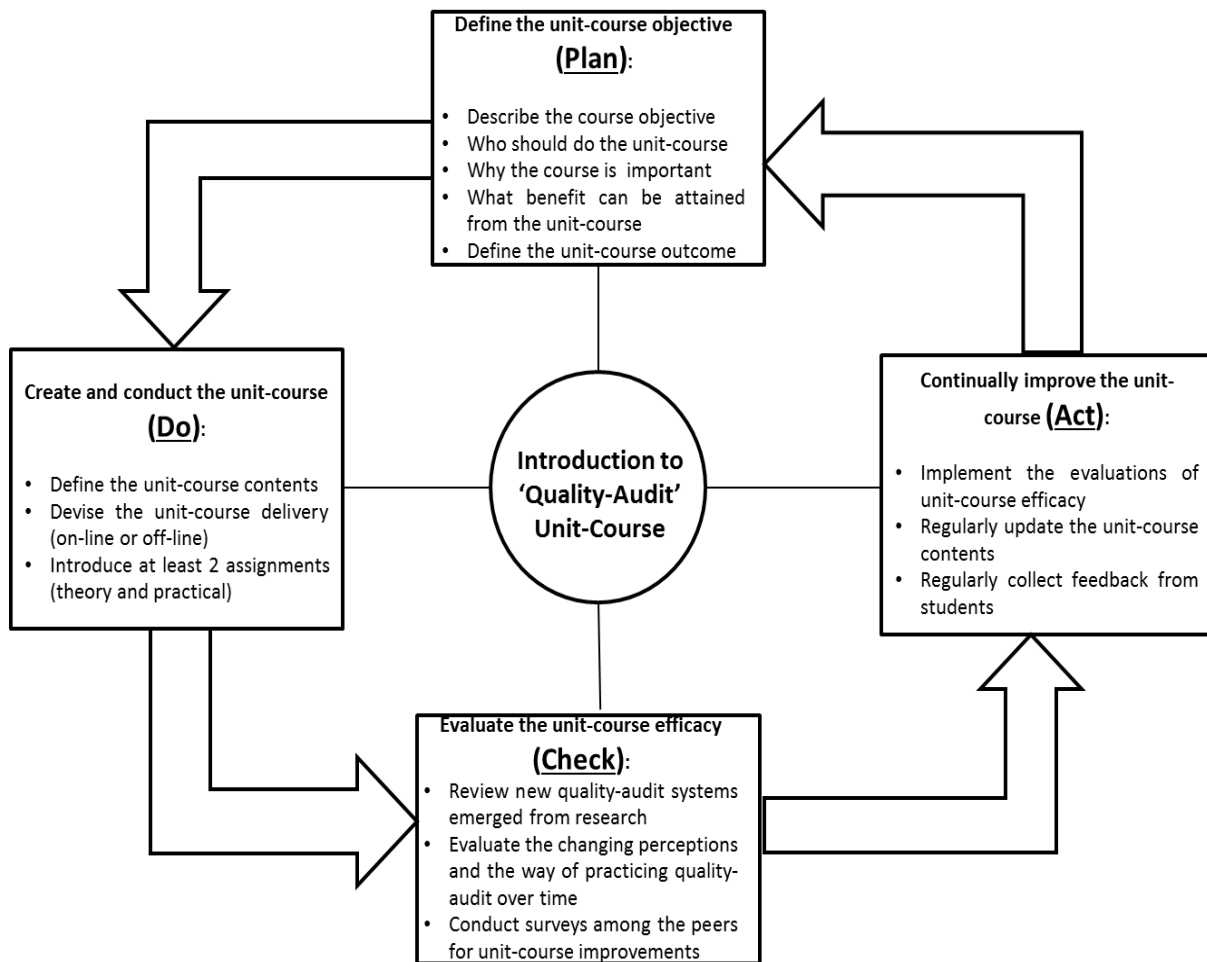


Figure 3. PDCA cycle for the improvements of undergraduate 'quality-audit' unit-course and students' learning outcomes.

The PDCA approach should entail as, defining objectives of unit-course (Plan), creating and conducting course (Do), monitoring course effectiveness (Check), and continually improving course (Act). At the end of this unit-course, course feedback from all participated students should be taken on a regular basis. These collected data should then be fed into the PDCA loop for continuous improvements and further implementations.

DISCUSSIONS AND CONCLUSION

The ISO standard focuses on continuous improvement of quality system where 'quality-audit' has similar objectives. A myriad range of misconceptions are observed in 'quality-audit' and 'audit-quality'.

Teaching and learning of 'quality-audit' can be effective if 'student-centred' and 'inquiry-based' learning approaches are applied. For a successful outcome of this unit-course, the student should be able to learn critical issues of quality, gain 'hands-on' and 'minds-on' capability of quality audit practices and understand business consequences. It should enhance students' motivation and engagements, and foster creativity and team spirit. It improves students' decision-making, problem-solving and critical thinking abilities. Successful learning of 'quality-audit' (both theory and practical) should help students in building their confidence and enhancing their employability. Students should be able to easily accommodate in the workforce and achieve a higher awareness of social and business implications of their studies. Students should find better applications of their studies in business/work place, and become future informed citizens taking their own responsibilities.

Apart from learning the principles and functioning process of quality-audit, students should also be able to learn and understand that:

- Quality-audit can contribute to achieving the fundamental goals of any organization for success i.e., quality, compliance, and confidence.
- Consideration should be given as to how quality-audit can add value to the organization, become effective for continuous improvement, and how and which way it is implemented.
- It is necessary to establish a proactive and positive work culture of practising 'quality-audit' and gain a genuine and strong commitment from top management.
- People development should be given foremost priority while establishing a work culture of an effective 'quality-audit' practice.

It is evident that the perception of quality-auditing and the way quality-audit is practiced vary considerably from one organization to another because of variable nature of business practices, different maturity levels and modus operandi, work cultures, management styles and leadership. However, the fundamental objectives of quality-auditing are similar in every case presented as these are reflected in the review i.e., determining conformity or nonconformity of quality system elements with specified requirements; effectiveness of implemented quality system to meet specified quality objectives; providing auditee with an opportunity to improve quality system; and, fulfilling regulatory requirements (North Point Institute of TAFE, 1996). Due to a lack of independence, both internal and external quality auditors are likely to experience conflicts in playing their roles that may affect relationships with their peers and clients.

A range of measures are suggested to evaluate the quality of performed quality-audit. Two common regulations such as, 'partner-rotation' and 'audit-inspection' have been implied to enhance 'audit-quality'. When the external auditors are engaged, a distinct correlation is observed between 'audit-quality' and 'audit-efficiency', the reputation of auditing office, auditing fees, size of the audit firm, and proficiency of auditor. The complex nature and mode of relationships between auditors and clients impact on 'audit-quality'.

This article acknowledges a limitation as it describes only the fundamental aspects of a complete 'quality-audit' process. The prescribed undergraduate unit-course will have other contents such as, theories, models, case studies, standards, and regulatory requirements. It is out of scope to elaborately discuss these contents. However, the presented literature review and other information of this article may greatly help the academics to incorporate them into unit-course materials, and subsequently, they should strive for continuous improvements of the devised unit-course.

This article makes a solid contribution to both literature and practices. Notwithstanding, fundamental teaching and learning aspects of 'quality-audit' are discussed, however, to become qualified and professional quality-auditor, a structured and tailored training is required. A professional quality-auditor requires excellent facilitation skills, and an ability to probe, clarify, question, support, acknowledge, and encourage people (Ingman, 1991) which our students should be able to learn through this unit-course presented.

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