
The role of accounting literature and professional training in enhancing common life-based characteristics held by a forensic accountant (an empirical investigation)

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Abstract: This study aims, through a questionnaire, at establishing the possible role of accounting literature and professional training in enhancing common life-based characteristics held by an accounting expert called upon to run forensic activities. The characteristics used in the questionnaire are held by all human beings with various degrees. The special case about Iraq is that there are no holders of certificates in forensic accounting. Thus, the study's main task is to check whether accounting literature and professional training are capable of enhancing certain characteristics held by an Iraqi forensic accountant. The responses of three samples (accountants, auditors and academics) are analysed through various statistical techniques at various levels which allow various comparisons and inferences. The single most important conclusion is that a crucial role can be attributed to professional training in enhancing common life-based characteristics compared to a weak role that can be attributed to accounting literature.

Keywords: academics; accountants; accounting literature; auditors; characteristics; forensic accounting; forensic accountant; professional training; enhancing, role.

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1 Introduction

Generally, the forensic accounting literature offers three possible characterisations of forensic accounting. These are:

- 1 A pure accounting matter requiring only investigative skills or related to court matter (e.g., Manning, 2002; Howard and Sheetz, 2006; Damiola and Olofinsola, 2007; Popoola et al., 2014). This characterisation is very restrictive and not illuminating.
- 2 A minor extension in accounting requiring only a combination of accounting, auditing and investigative skills (e.g., Samuel et al., 2013; Houck et al., 2006; Curtis, 2008). This characterisation is not significantly different from the first one since any investigative duty entails auditing. Thus, adding auditing duties does not allow this characterisation to be fundamentally different from the first one.
- 3 A multidisciplinary field of inquiry and, accordingly, a multifunction process requiring a multidisciplinary accountant (e.g., Huber and DiGabriele, 2014; Okunbor and Arowoshegbe, 2013; Watters et al., 2007). According to this characterisation, forensic accounting is about various interrelated and neighbouring disciplines or functions with accounting being the prime one. The third characterisation is more realistic, actually a fact, since accounting itself is simply an amalgamation of various fields (e.g., arithmetics, economics, finance, management, law in general, taxation, etc.). It is this third characterisation that is adopted by the current paper.

The most important issue to be critically and analytically tackled by the current paper is whether a non-certified forensic accountant is capable of running forensic accounting activities based on adhering to certain common life-based characteristics. These common life-based characteristics require a multidisciplinary forensic accountant.¹ Throughout the history of mankind, including ancient eras, there have been self-educated scholars, scientist, inventors, creators, intellectuals and philosophers who had greatly influenced the daily life of their contemporary eras with repercussions extending over many eras including current era. The list of these genius people is perhaps endless.² There were four important characteristics. First, they were not graduated from a university and accordingly they did not hold a degree or a certificate in a very specialised and restricted discipline. Second, their works were not restricted in a specific area. Third, they were very efficient in various unrelated as well as related areas or disciplines according to the standards of their times, and some of their works are even efficient according to the standards of our time. Fourth, their influences have been so great to the extent that these

influences have been felt throughout the history of mankind and some of these influences are called upon today (e.g., medicine, herbal medicine, engineering, geometry, mathematics, accounting³, etc.).

The accountant who has knowledge in integrated neighbouring disciplines (i.e., a multidisciplinary accountant) is nowadays on increasing demand (Hartstein, 2013). Can we, accountants as academics or professionals, manage our academic and professional duties without having adequate knowledge in neighbouring fields? The field of international accounting is a case in point. Actually, international accounting, as an extension in accounting theory and practice is an example that the extension itself requires borrowing from many other disciplines. In addition to various accounting sub-fields such as financial accounting, cost accounting, managerial accounting, tax accounting, and the traditional neighbouring disciplines constituting accounting itself such as arithmetics, economics, finance, management, law in general, taxation, etc., there are geography, history, sociology, psychology, anthropology, national and international politics, national and international economic and monetary policies, etc. There are always two interrelated factors that allow an academic to have a multidisciplinary approach to various scientific discourses: *literature* and *training*. Who is in a better position to write and lecture on international accounting as a multidisciplinary field, an academic accountant or group of academics with each discussing a specific area? What about connectivity with accounting? This connectivity dictates that an academic accountant is in a better position to write and lecture on international accounting. Who is in a better position to practice international accounting? An accountant or group of experts with each interested in a specific area related to international accounting? Accordingly, who is in a better position to run forensic accounting activities in cases where a non-certified forensic accountant is not available? An experienced accountant with academic and/or professional certificate is in a better position to extend his activities to embrace forensic one.

However, the focus of this paper is on the role of accounting *literature* and professional *training* in enhancing common life-based characteristics held by a forensic accountant due to their vital role in any forensic accounting duty. The degree of adherence to these characteristics would allow judging whether a person running forensic accounting activities is a multidisciplinary forensic accountant. The question, then, is it possible for an accountant to extend his professional experience to embrace forensic duties in cases where specialised certificate is not available provided that accounting literature and professional training enhance common life-based characteristics.

The contribution of this paper is to bridge the gap in the forensic accounting literature on two interrelated issues. The first is an investigation aiming at establishing whether a non-holder of a forensic accounting certificate is capable to carry out forensic accounting activities. The second is finding out whether those who run forensic accounting activities are aware of certain characteristics they are supposed to adhere to. Although our paper is restricted to the Iraq situation, a generalisation is possible to all countries in which forensic accounting activities are run yet those who run such activities hold neither academic nor professional certificate in forensic accounting.

The remaining parts of this paper will proceed as follows: theme of forensic accounting, literature review, research question, research objective, research limitations, research methodology, questionnaire, analysis of responses and conclusion. The theme of forensic accounting deals with the importance and definition of, and possible extension

in, forensic accounting as a field of inquiry. The literature review includes an evaluation of the papers on forensic accounting considered to be relevant to the current paper. The gaps in these papers as far as the current paper is concerned are emphasised. The research question is centred on the unique situation of forensic accounting in Iraq. The research objective focuses on finding out whether there is a real role by accounting literature and professional training in Iraq in offering a substitute for a certificate in forensic accounting as far as adherence to certain common life-based characteristics is concerned. Two research limitations are identified: First, the list of the chosen common life-based characteristics supposed to be enhanced by the accounting literature and professional training is incomplete. Second, culture as the most influential factor in creating and shaping common life-based characteristics is not discussed in this paper. Three issues related to the questionnaire are discussed: design of the questionnaire (see Appendix), rating of responses, and population, samples and data collection. The research methodology explains various constituents ranging from the most general constituent (i.e., the general philosophy) to the one dealing with detailed analysis (i.e., statistical tools). The most important section in this paper is the analysis of responses. In this section, the responses are discussed, evaluated and interpreted. Discussion, evaluation and interpretation are based on the results of statistical tools used which include the mean and z-values. To check on whether there are statistically significant differences among the responses of three samples chosen (accountants, auditors and academics), Kruskal-Wallis and Mann-Whitney tests are used. A summary of the most important findings of this paper is discussed as a conclusion and is related to the main objective of this paper, that is, the capability of accounting literature and professional training in enhancing common life-based characteristics to be held by a forensic accountant in Iraq as a country that has neither academic nor professional certificate in forensic accounting.

2 Theme of forensic accounting

There has been an increasing emphasis in the accounting literature on a justified growing demand for forensic accounting services (e.g., Carnes and Gierlasinski, 2001; Rasmussen and Leauannae, 2004; Heitger and Heitger, 2008; Seda and Kramer, 2009; Bressler, 2011; Stone and Miller, 2012; Huber, 2012, 2013; Bhasin, 2013; Salleh and Ab Aziz, 2014). This emphasis is attributed to the importance of forensic accounting and based on many indications such as recognising it as a discipline (Mitric et al., 2012; Salleh and Ab Aziz, 2014) or a sub-discipline (Stone and Miller, 2012), giving it the status of a profession (Renzhoua, 2011; Huber, 2012; Dutta, 2013; Huber and DiGabriele, 2014), calls for regulating its activities (Huber, 2013), its role in crime discovery and prevention in the business world (Lokanan, 2014; Samuel et al., 2013; Reddy and Sebastin, 2012; Clements and Shawver, 2011; Carnes and Gierlasinski, 2001; Dutta, 2013), its ability in restoring confidence and credibility in financial reporting activities and accordingly enhancing the effectiveness of corporate governance (Bhasin, 2013), higher education involvement through either offering degrees in forensic accounting (e.g., Caliyurt and Crowther, 2006; Welsh and Hannis, 2011; Seda and Kramer, 2009) or just some courses on forensic accounting (e.g., Rezaee and Burton, 1997), and its role in injecting more forensic skills in auditing through, for example, a merger of what could be regarded as common ground between auditing with forensic accounting (DiGabriele, 2009).

This growing emphasis on the demand for forensic accounting is accompanied by a growing academic interest in formulating, developing and crystallising various subject matters of forensic accounting. One such subject is various definitions which at the same time are generally useful in providing insights into the objectives, components, duties, interdisciplinary nature, environmental contexts⁴, developments, etc.; of forensic accounting. Various definitions are provided ranging from a very broadly stated nature of forensic accounting to a more elaborate and specific identification of its major duties, components, potentialities and environmental contexts. Kahan (2006, p.23) provides a definition of a very broad nature by stating that “..... forensic accountingis really much more than dealing with the numbers. It is no longer just basic fraud work”. Another broad definition is the one provided by Taunakotta (2010), quoted by Astutie and Utami (2013), since his definition of forensic accounting is restricted to the application of accounting field to the law area.

At a more specific and elaborate level, various definitions utilise the integrative nature of forensic accounting, its specific duties, its research prospect and its environmental context. In terms of being a mixture of various areas, Samuel et al. (2013) consider the integration of accounting, auditing and investigative skills as an indication of having specialty called forensic accounting. Bressler (2011) prefers forensic accounting to be an integration of auditing, accounting with an overemphasis on accounting information systems. DiGabriele (2008a) wants forensic accounting to be a combination of skills and knowledge in accounting, auditing, law and investigative techniques. In terms of duties, Crumbley et al. (2009) suggest identification, recording, settling, extraction, sorting, reporting and verification of financial data as duties resulting from forensic accounting action for the purpose of resolving legal disputes. For research purpose, Huber and DiGabriele (2014, p.45) define forensic accounting in a more comprehensive, inclusive and integrative approach as:

“.....a multidisciplinary field that encompasses both a profession and an industry, where civil or criminal economic and financial claims, whether business or personal, are contested within established political structures, recognized and accepted social parameters, and well defined legal jurisdictions and informed by the theories, methods and procedures from the fields of law, auditing, accounting, finance, economics, psychology, sociology and criminology.”⁵

An interesting issue raised by Huber and DiGabriele’s (2014) definition is that of the influence of culture in terms of political structures, social parameters and legal jurisdictions on forensic accounting. Since their definition is not bounded by time and place then different cultures in different countries would have different influences on forensic accounting’s types, structures, influences, duties, consequences, etc. Culture influences both the type of accounting literature preferred for teaching purposes and professional training procedures adopted in a specific society. In addition, the characteristics themselves, the theme of this paper, are highly influenced by the cultural dimensions dominated in a specific country. Then, the inputs and outputs of forensic accounting activities are totally shaped by a specific country’s culture. This is a fertile research area which can add more to accounting literature. For example, insightful knowledge can be achieved by accounting research about the role of various cultural tendencies (e.g., collectivism versus individualism, large versus small power distance, strong versus weak uncertainty avoidance, etc.) on various subject matters of forensic accounting. This, in turn, would provide additional support to a widely held belief in the

existence of an intimacy between culture in general and mode of thinking at work place (Hofstede, 1983), and accounting in particular (Gray, 1988).⁶

3 Literature review

It is almost impossible to read even a single article on forensic investigation that lacks an argument on characteristic(s) and skill(s)⁷ held by a forensic investigator (e.g., Wallenius et al., 2006; Collins and Berg, 2008; Schulz et al., 2014). This is also the case with forensic accounting. Furthermore, words such as characteristic(s) and skill(s) are referred to directly in almost all definitions of forensic accounting (e.g., Houck et al., 2006; Gray, 2011; Kranacher et al., 2001; Rasmussen and Leauannae, 2004; ACFE, 2010). However, the forensic accounting literature on characteristics and skills generally lacks focus, in-depth analysis, critical evaluation and an appropriate differentiation and characterisation. An absence of a proper characterisation leads to inadequate classification of both skills and characteristics. The overwhelming majority of this literature addresses the issue of characteristics and skills in almost a very general style and as though they are synonymous. In addition, this literature does not give adequate attention to the ethical dimension since ethics is the centre of the mentality of a forensic accountant as a judge or neutral arbiter on a disputed accounting matter. Accordingly, this paper tries to fill in three gaps in the forensic accounting literature: synonymity, characterisation and ethical dimension. The literature surveyed below is analysed and criticised based on these three issues.

Astutie and Utami (2013) utilise a questionnaire to focus on seven skill competences categorised into two groups of composite competence. The first group is called relevant skills and consists of:

- 1 analysis and synthesis result of discovery
- 2 critical thinking
- 3 investigation flexibility
- 4 legal knowledge and insight.

The second group is called relevant characteristics and consists of:

- 1 detail competence
- 2 oral and written competence
- 3 skepticism behaviour.

There are three problems with the Astutie and Utami's (2013) grouping. First, their list of skills and characteristics is very short which would not render any useful and solid generalisation. Second, they mix skills with characteristics. This occurs in the first and second groups. Analysis and synthesis, critical thinking and investigation flexibility are characteristics since they are held by all human beings, the educated as well as the uneducated. The same thing is true of the second group since detail competence and skepticism behaviour are characteristics rather than skills. Third, their list of skills and characteristics lacks an ethical dimension usually emphasised, but not adequately tackled,

in the forensic literature as an important ingredient of any investigative action involving disputed matters.

With an absence of ethical dimension, adequate differentiation and characterisation of skills and characteristics, Bhasin (2013) tries in a questionnaire study to establish a ranking of nine 'important skills' based on five-point Likert-scale ranging from strongly disagree (0), indicating the least important, to strongly agree (4), indicating the most important. The questionnaire was sent to three groups: accounting practitioners, academics, and users of forensic accounting services. The skills surveyed are deductive analysis, critical thinking, unstructured problem solving, and investigative flexibility, and analytical proficiency, oral communication, written communication, specific legal knowledge, and composure. There are two problems with Bhasin's study. First, personal characteristics (e.g., critical thinking) are mixed up with learned skills (e.g., written communication). Second, the responses of the three groups are mixed together for analysis purposes which deprive the study from very important analytical and more conclusive insights.

Van Akkeren et al. (2013), with an absence of adequate attention to the ethical dimension and adoption of a synonymity approach to skills and characteristics, try to establish a ranking for two groups of requirements by university graduates seeking to conduct forensic accounting in Australia. The ranking is based on 32 interviews with ten accounting firms undertaking forensic accounting services in Australia. The two groups of requirements are work-based skills and personal attributes. The first group of requirements consists of 17 skills. These are communication, critical thinking, interpersonal skills, technical accounting skills, attention to detail, auditing/industry experience, diagnostic skills, technology skills, conceptual thinking, legal knowledge, interview/investigation, commercial/business advisory, financial/numeracy skills, ability to work in a team, time management, fraud risk assessment, and marketing. The second group of requirements consists of 12 personal attributes. These are interpersonal, analytical, inquisitive, intelligent/intuitive, engaging/confident, resilient, common sense, measured/calm, methodical, collegiality, flexibility, and integrity. There are four problems with the above grouping. First, work-based skills group includes many personal attributes such as communication, critical thinking, attention to detail, diagnostic skills, conceptual thinking, interview/investigation. These are characteristics that can be held by any human being whether he/she is at work or at home, educated or not. Second, there are other ethical values of utmost importance for conducting forensic action yet they are overlooked (e.g., independence, objectivity, faithful representation). Third, the grouping is very general. Thus, neither the work-based skills nor the personal attributes are sub-grouped which is very important for analytical as well as ranking purposes. Fourth, the study is restricted to opinions of accounting firms conducting forensic accounting services in Australia. There are other groups (e.g., academics) who fully contribute to the supply of skills and enhancement of characteristics necessary for conducting forensic accounting action.

Although Salleh and Ab Aziz (2014) give attention to the ethical dimension through supposedly pure religious-based characteristics, the synonymity issue is almost strongly adhered to. Salleh and Ab Aziz (2014) try to tackle in a questionnaire study four groups of traits, skills and ethical values required to be adhered to by a forensic accountant in the public sector. These are:

- 1 five essential traits and characteristics (analytical, ethical, detailed oriented, confident and evaluative)
- 2 five core/basic skills (investigative ability, auditing skills, critical/strategic thinker, identify key issues, and understand the goals of a case)
- 3 five relevant enhanced skills (analyse and interpret financial statements and information, fraud detection, audit evidence, asset tracing and internal controls)
- 4 five Islamic ethical values (trustworthiness, integrity, accountability, transparency/honesty and discipline).

There are at least three problems in the above grouping of traits, skills and ethical values. First, pure personal characteristics are mixed up with pure educationally acquired skills. This is the case with the second and the third groups. Only auditing skills within the second group are purely acquired by academic and professional education, whereas the other four characteristics are held by any human being and definitely enhanced, but not created, by education. With respect to the third group, analysis, interpretation, tracing and detection are personal characteristics enhanced and given specific focus, emphasis and orientation by academic and professional education. They are only enhanced, but not created, by education. Second, with regard to the fourth group, all the five ethical values are personal characteristics that can be found in any society. However, Islamic Sharia focuses on, refines, improves and insists on adherence and implementation by every Muslim of these and other ethical values in a sincere and wholehearted manner. Third, the analysis of responses is not conducted at each sub-group level. For example, accounting lecturers (academics) and law lecturers (academics) are mixed together for the purpose of analysis. Accounting lecturers deal with the specific (emphasis added) nature of a disputed accounting matter, i.e., the very nature of accounting methods, concepts, principles, standards and reporting. Law lecturers deal with the general (emphasis added) rules to be followed when investigating a disputed matter in any field or area. The responses of those dealing with a specific focus in accounting and the responses of those dealing with a general focus in law cannot be grouped together for analytical and evaluative purposes. Their responses in a questionnaire related to forensic accounting are definitely based on different backgrounds and criteria.

In our paper, we make use of the above literature and try to avoid the above-mentioned problems. Accordingly, the current study has six focuses. First, only characteristics held by any human being, educated or not, are investigated. Accordingly, this paper does not deal with skills. A clear differentiation between characteristics and skills allow discerning characteristics which in turn would allow an appropriate focus, analysis, evaluation, classification of characteristics. Second, ethically-based characteristics are separated from other characteristics to find out the role of both professional training and accounting literature⁸ on ethics required by a forensic accountant. Third, these characteristics are essential for any expert running forensic activities including those assigned forensic accounting action. Accordingly, these characteristics can be directly as well as indirectly the subject matter of both accounting literature and professional training. Thus, the role of accounting literature can be compared to the role of professional training at various levels.

Furthermore, causality can be separately established for the role by accounting literature and professional training on common life-based characteristics. It must be emphasised that there are other characteristics that can be investigated. However, our focus in this paper is on the role of accounting literature and professional training in enhancing common-life characteristics held by a forensic accountant. Then, the 18 chosen characteristics (Appendix) are enough for establishing the extent of causality (i.e., in terms of enhancement) between accounting literature and professional training and all possible common life-based characteristics. Fourth, the characteristics are purposively classified into groups for comparison purposes. Fifth, the questionnaire developed was distributed to three groups supposed to be the most important and most interested stakeholders in forensic accounting in Iraq. These are: accountants, external auditors and academics. Various comparisons among these three groups are greatly highlighted in this paper. Sixth, the forensic accounting literature does not address a situation where a forensic accounting action is called upon but those who conduct forensic accounting hold no educationally or professionally awarded certificate in forensic accounting. This paper addresses such a situation by considering the role of both accounting literature and professional training in enhancing the 18 characteristics which would allow judging on the ability of those running forensic accounting to conduct accounting investigative activities as experts as far as common life-based characteristics are concerned. Put differently, this paper tries to investigate the ability of accounting literature and professional training to be substitutes for an academic or professional certificate in forensic accounting in relation to common life-based characteristics.

In summary, what is sought in this paper is an enquiry into the role by both accounting literature (theory) and professional training (practice) in enhancing only common life-based characteristics held by any human being which, at the same time, are essential for the professionalism required by any accountant called upon to conduct forensic activities yet he/she holds no academic or professional certificate in forensic accounting. This enquiry is guided by adequate attention to the ethical dimension, differentiation between skills and characteristics (i.e., avoidance of the synonymity problem) and characterisation of characteristics.

4 Research question

Currently, the Iraqi academic and professional institutes and bodies do not offer any type of certificate in forensic accounting despite the apparent need for forensic accounting services due to the growing number of disputed cases necessitating such services. Forensic accounting services are currently provided by either certified accountants or certified external auditors. These two groups gain their expertise through two main avenues. These are accounting literature and professional training. The accounting literature provides theoretical background on various accounting, auditing and other related and neighbouring areas such as economics, management, law, systems analysis, statistics, etc. This background is obtained at various academic levels as well as through continuously updated knowledge on these various fields. The professional training is a vital complementary part of knowledge acquisition and also an important complementary part to the various examinations taken by those seeking professional certificates. In

addition, holders of professional certificates practise professional training as long as they carry out professional duties.

Thus, the research question is about a unique phenomenon of a forensic accountant. This unique phenomenon has the following features:

- 1 There is no Iraqi certificate in forensic accounting.
- 2 There is not any Iraqi who holds a foreign certificate in forensic accounting.
- 3 There are Iraqi academic and professional bodies that award academic and professional certificates in accounting and auditing.
- 4 There is a growing number of disputed accounting cases.
- 5 There is a growing demand for forensic accounting services.
- 6 Certified accountants and external auditors are called upon to run forensic accounting action despite the fact that they hold no certificate in forensic accounting.

The research question is, then, as follows: do accounting literature and professional training in Iraq provide an expert capable of carrying out forensic accounting activities? This expert holds certain common life-based characteristics, as all human beings do, which are supposed to be enhanced by accounting literature and professional training (i.e., the causality issue). This paper suggests 18 characteristics that can be enhanced by accounting literature and professional training for the creation of what can be considered as an expert in forensic accounting as far as common life-based characteristics are concerned.

5 Research objective

This paper seeks to achieve four objectives. First, it investigates the possible role by accounting literature and professional training in enhancing common life-based characteristics to be held by a forensic accountant. Alternatively, it tries to check whether or not there is an impact by accounting literature and professional training on common life-based characteristics to be held by a forensic accountant when conducting forensic activities. Second, it tries to establish which of the accounting literature and professional training is more influential in enhancing common life-based characteristics. The objective here is to find out separately the impact of accounting literature and professional training on common life-based characteristics. Third, as an extension of the second objective, it tries to find out the separate impact of accounting literature and professional training on characteristics individually, groups of characteristics and all characteristics through an aggregation of all responses of a sample to all characteristics. The third objective would allow various comparisons and, accordingly, various inferences. Fourth, it tries to find out the separate impact of accounting literature and professional training from the perspective of three samples together as though they represent one single sample (i.e., an aggregated sample) which would allow the derivation of inferences based on the responses of all stakeholders to a single characteristics, a group of characteristics and all characteristics.

6 Research limitations

This paper has, at least, two limitations as far as common life-based characteristics are concerned. First, more common life-based characteristics can be chosen (e.g., critical thinking, flexibility, attention to detail, oral communication, skepticism, confidence, diagnosis, resilience, and team work ability). In addition, with more characteristics brought into the analysis, more elegant characterisation and grouping can be designed than that shown in Table 1. However, our primary objective in this paper is an investigation of the role of accounting literature and professional training in enhancing common life-based characteristics held by a forensic accountant. The 18 characteristics chosen in this paper are assumed to be enough for the purpose of achieving the stated primary objective. Second, culture plays a very important role in enhancing characteristics for forensic accounting purposes. Culture creates and enhances all modes of thinking and learning. Forensic accounting literature pays almost no attention to the intimate relationship between culture and forensic accounting at a specific society's level. Its role could be regarded as even more crucial and influential than the role played by both accounting literature and professional training. This paper overlooks the role played by culture in influencing common life-based characteristics.⁹

Table 1 Grouping of the 18 characteristics

| <i>Group title</i> | <i>Characteristics within each group</i> |
|---------------------------------|---|
| Ethical dimension group | V5 (neutrality/impartiality), V6 (independence), V7 (faithful representation), V8 (objectivity) and V11 (awareness about conflict of interest). |
| Economic rationality group | V1 (accuracy), V3 (utilising time efficiently), V9 (materiality thinking), V4 (minimum paid cost). |
| Receptivity and judgement group | V2 (patience and care), V10 (communication and dialogue), V12 (semantic interpretation), V13 (logical sequence and connectivity) and V14 (cognitive awareness). |
| Systems oriented group | V17 (exact identification of constituents), V15 (systems approach), V16 (complementariness and interrelated functions). |
| Continuous education | V8 (Knowledge self-acquisition). |

7 Research methodology

Following the research onion (Saunders and Tosey, 2012/2013; Saunders et al., 2015), the research methodology of this paper is as follows: The general philosophy is based on positivism. That is, the 'is' is sought rather than the 'should be'. The questions in the questionnaire are about what is going on. The questions are about whether the currently available accounting literature and current professional training in Iraq are capable of producing qualified forensic accountant (or a multidisciplinary forensic accountant) as a substitute of a holder of forensic accounting certificate. Testable hypotheses, an important ingredient of positive research, are implicit rather than explicit. These are centred on the above mentioned capability of both accounting literature and professional training. The approach used is mainly a deductive one. Induction is used to arrive at generalisations. The individual responses to each question by respondents of sample(s)

are used to derive mean values and calculated z-values as generalisations. These generalisations are first used to deduce conclusions through comparisons with hypothesised mean and critical z-values to allow judgement about the position of each sample alone. They are also used for comparisons between and among samples. What most matters is that generalisations are combined to arrive at conclusion(s) which means that deduction prevails. The questionnaire as a survey of opinions is used to represent the strategy adopted by this paper.¹⁰ Mono method quantitative is reflected through the Likert five-point scale. It is cross-sectional study since it seeks responses of individuals in three samples (sections over a single period). Statistical techniques such as the mean, z-value, Mann-Whitney test and Kruskal-Wallis tests are used for the derivation of generalisations that are deductively combined.

8 The questionnaire

8.1 Design of the questionnaire

The questionnaire consists of 18 questions/variables (Appendix). All these questions are about characteristics which are essential prerequisites for conducting any forensic investigation. On the other hand, these characteristics are already held by any human being. That is, any human being learns them from her/his life's experiences. In addition, people hold them in various degrees. As such, they can be enhanced by the type of education sought. In accounting realm, these characteristics can be enhanced by both accounting literature and professional training. Since the existence of the 18 characteristics is not investigated in this paper, then the prime objective of this study is to check whether accounting literature and professional training are capable in enhancing the chosen common life-based characteristics. Accordingly, each question is divided into two sub-questions supposed to be integrated and complementary. One question is related to the role of accounting literature (theory) in enhancing a common life-based characteristic and the other is related to the role of professional training (practice) in enhancing the same common life-based characteristic mentioned in the first sub-question. Such integration and complementariness are very necessary in a field of enquiry such as accounting in which it is assumed that neither its theoretical component alone nor its professional component alone can enhance the characteristics required for conducting professionally-based activity, including forensic accounting, with due professionalism. A comparison between the role of accounting literature (theory) and the role of professional training (practice) will be carried out through various statistical techniques to establish whether accounting literature or professional training is more essential and crucial in enhancing the 18 characteristics.

The 18 variables are governed by purposefully intended grouping (Table 1). There are five groups. The first group is called the ethical dimension group. The emphasis on ethics in accounting and auditing literatures is abundant (e.g., Boyce, 2014; Duska and Duska, 2003; Klimek and Wenell, 2011; McPhail, 2003; McPhail and Walters, 2009, DiGabriele, 2008b, 2011). Ethics should be even overemphasised for forensic accounting purposes (e.g., Candilis, 2009). Almost all papers in the forensic accounting literature require one or more types of ethical behaviour for the purpose conducting forensic accounting. However, our review of the forensic accounting literature available to us¹¹ results in finding only two empirical papers that give different degrees of attention to the

importance of the ethical dimension for a forensic accountant's activities. Van Akkeren et al. (2013), apparently with less attention, choose only one ethical value (i.e., integrity) within a group of 12 personal attributes. Salleh and Ab Aziz (2014), apparently with more attention, accept a group of five ethical values as the most important based on their system of rating. However, Salleh and Ab Aziz (2014) give a priority to technical requirements over the ethical requirements. In addition, their five ethical values rated by them as the most important are not well structured. Ethics must be truly overemphasised and given priority in any investigation involving two or more disputing parties, and accordingly must be given priority and overemphasised in any academic paper on forensic accounting. One particular ethical value; i.e., awareness of conflict of interest, included within the ethical dimension group requires adequate justification. Despite the utmost importance of the conflict of interest in the whole work of any accountant, usually this characteristic is not directly and indirectly considered in the forensic accounting literature. This is perhaps due to its supposedly guaranteed existence through other characteristics such as neutrality/impartiality, objectivity, faithful representation, etc. Its importance actually stems from the fact that an accountant when conducting her/his duties, including those required in a forensic accounting action, is supposed to be a genuinely honest arbiter requiring her/him to be fully aware about the conflict of interest. Any accountant is naturally required to be an arbiter between management and owners, between an entity and society at large. Finally, the awareness of conflict of interest can be considered as a by-product of the other four ethical values [i.e., V5 (neutrality/impartiality), V6 (independence), V7 (faithful representation), V8 (objectivity)], thus, its inclusion within this group is a necessary crosschecking variable on the objectivity and consistency of the responses to the other four variables.

The second group consists of the economic rationality characteristics. Although, economisation on cost must govern any human behaviour, economisation on cost is even overemphasised in accounting since one of the core essences and duties of accounting is about minimising of. This group consists of four characteristics. These are accuracy, utilising time efficiently, materiality thinking, and minimum paid cost. Two variables within the second group require justification. These are accuracy and materiality thinking. Accuracy characteristic is included within this group because inaccurate behaviour/action definitely cost more, i.e., unnecessary additional cost. Materiality thinking also results in lowering cost since paying attention to every available evidence and aspect related to an accounting disputed matter would definitely cost a lot. By focusing on the most important evidence and aspect and leaving out of consideration the least important evidence and aspect would avoid wasting time and cost.

The third group consists of five characteristics which are supposed to lead to adequate final judgement. Furthermore, the five characteristics within this group represent by themselves a complete system for investigation. The logic behind this group is as follows: investigation is about dialogue and communication (V10) which, by necessity, lead to an extraction of information. The extraction of information in any human setting requires patience and care (V2) which must always be accompanied by cognitive awareness (V14) as opposed to created awareness (i.e., acting) attempted usually by those who are investigated. Semantic interpretation (V12) is a vital ingredient of any mental process by any human being in any dialogue situation. Its importance for forensic investigation cannot be overemphasised since what is sought is an understanding and comprehension of what is disclosed by the investigated individual(s). Finally, the logical sequence and

connectivity of bits and pieces of what occurs during the investigation process (V13) indicate an ability in formulating one single story having both a beginning and an end that are logically connected. The end result of the connectivity and the logical sequence among these five characteristics ought to be fruitful output ready for arriving at a reasonable judgement on a disputed accounting matter.

The fourth group consists of three characteristics representing a systems oriented thinking. The logic dictating the grouping together of characteristics V17, V15 and V16 is that any disputed matter is a phenomenon. Any phenomenon influences and, itself, is influenced by its surroundings (i.e., its environmental contexts). The systems-oriented approach is the best to understand the core essences of any phenomenon and its environmental contexts. Thus, the exact identification (determination) of constituents/components (V17) of a disputed accounting matter must be looked upon in a systems approach (V15) in order grasp the type of influence of a disputed accounting matter on its specific surroundings and the type of influences by the specific surroundings on the disputed matter which require, for efficiency and effectiveness purposes, further understanding of the complementariness and interaction (V16) among various interrelated functions or areas (accounting, finance, human resources, marketing, production, storage, etc.).

The fifth group is a single-characteristic group, that is, continuous education for the sake of continuously knowledgeable educated (updated) mind achieved mainly through knowledge self-acquisition. This characteristic indicates an absence of a belief in perfection and absolute truth.

Thus, the five groups of characteristics cover the whole area of investigation and represent five interrelated, integrated and complementary constituents. First, a forensic accounting action must be ethical since a forensic accountant is supposed to be a genuinely neutral and honest arbiter entrusted by disputing parties to give fair judgement. Second, a forensic accounting action must be run in an economically rational manner since a forensic accounting action incurs cost and consumes time and, in a disputed accounting matter, it is about money which necessitates an investigator having economically rational mind. Third, a forensic accounting action must be built on connectivity and logical sequence in order to have sequentially and logically interrelated components of one single story. On the other hand, connectivity and logical sequence can be considered as a substitute for deduction.¹² Fourth, a forensic accounting action requires a systems oriented approach since any disputed matter is surrounded, created and influenced by many systems and functions (e.g., management, economics, organisation, marketing, law, etc.) and itself influences its surroundings. A systems oriented approach allows an adequate grasp of the essence of the most important ramifications of a disputed accounting matter. Fifth, a forensic accounting action requires knowledge self-acquisition which indicates an open mind, self-criticism, lack of perfection and an appetite for continuously updating one's knowledge. Thus, a forensic accountant needs to acquire knowledge on a continuous base about accounting, auditing, economics, management, law, investigative techniques, statistics, systems analysis, sociology, psychology, etc. A forensic accountant also needs to acquire continuous and accumulated knowledge about the disputed accounting matter when he/she is called upon to investigate it.

It is very important to emphasise that the respondents to the questionnaire were not told about the above grouping and the purpose behind it in order to ensure the highest possible objectivity and spontaneousness responses when rating the 18 variables.

It is also very important to clarify that the questionnaire was written in Arabic language and submitted to Arabic speakers. Thus, there should not be any material misunderstanding by the respondents of the concepts included in the questionnaire since the respondents (accountants, auditors and academic accountants, i.e., holders of PhD in accounting) are all professionals in the same major field, i.e., accounting, and familiar with the concepts included in the questionnaire. The three chosen groups are supposed to be accounting experts and fully aware of the explicit and implicit implications of the texts of the questions as well as the concepts included in the questionnaire such independence, objectivity, conflict of interest, neutrality, accuracy, etc. It is quite natural that different groups in different professions and even different individuals in any single profession have slightly significant interpretations or understandings of any single concept. However, common understanding and interpretation of concepts in any field of inquiry must be present otherwise there would not be a single agreed upon 'concept'. Accounting and forensic accounting are not an exception. Accordingly, there must exist a common understanding and interpretation of various accounting concepts among accountants, auditors and academic accountants in Iraq. It is expected that, due to the familiarity and repetitive use of accounting concepts by accountants, auditors and academic accountants, would not be great differences in understanding and interpreting various accounting concepts. In addition, there are two facts supporting the situation of not having great differences in understanding and interpreting various accounting concepts. First, auditors are basically accountants. Second, accountants are graduates from educational institutions with academic accountants teach various accounting concepts and, possibly, indoctrinate them in the minds of their accounting students.

8.2 *Rating of responses*

Likert five-scale is used in rating the responses to the questionnaire. Table 2 shows the types of response and value assigned to each type of response.

Table 2 Rating of responses

| <i>Type of response</i> | <i>Rating</i> |
|----------------------------|---------------|
| Strongly agree | 5 |
| Agree | 4 |
| Neither agree nor disagree | 3 |
| Disagree | 2 |
| Strongly disagree | 1 |

8.3 *Population, sample and data collection*

The population is supposed to consist of all Iraqi certified accountants, external auditors and university academics holding PhD in accounting. However, inference to the larger population must be taken with caution. The questionnaire was distributed to three groups in Baghdad (the capital of Iraq). There are four reasons for restricting the distribution of

the questionnaire to the Baghdad area. First, in terms of number, Baghdad has the largest number of certified accountants, external auditors and holders of PhD in accounting. This means it is easy to find enough of those who wish to respond to the questionnaire. Second, most of the certified accountants, external auditors and academics in the other Iraqi cities are holders of certificates from the academic and professional bodies in Baghdad, thus, it would not make a difference if they are not included in any of the three samples in Table 3. Third, the distribution and collection of a questionnaire from hand to hand is not an easy endeavour in the other cities which are far away from Baghdad, taking into consideration that the Iraqi society is not familiar with responding to a questionnaire through computer network. Fourth, due to security reasons, it is dangerous and hazardous to travel to the other Iraqi cities for the sake of a questionnaire distribution.¹³ However, it would be better to state that this study is about the situation in Baghdad and, accordingly, there is no claim that it covers Iraq as a whole.

A target sample of 55 respondents is chosen for each group of respondents. Table 3 shows details about the population, sample size of each group or number of copies of questionnaire distributed and number of copies returned back.

Table 3 Population and sample size*

| <i>Groups</i> | <i>Population size</i> | <i>Copies of questionnaire distributed</i> | <i>Copies of the questionnaire returned back (sample size)</i> | <i>Percentage of copies returned back to number of copies distributed</i> |
|--|------------------------|--|--|---|
| Certified accountants | 457 | 55 | 35 | 63.6% |
| External auditors | 204 | 55 | 39 | 70.9% |
| University academics (only holders of PhD in accounting) | 89 | 55 | 33 | 60% |

Notes: *Data in the second column of Table 3 were obtained through direct contacts by the first author of this paper with the Union of Accountants and Auditors, the Iraqi Association of Certified Accountants and the Ministry of Higher Education and Scientific Research.

9 Analysis of responses

9.1 First: three separate samples

9.1.1 Analysis based on mean and z-values

Tables 4 and 5 respectively show statistics related to the responses by the three samples to the role by accounting literature and professional training in enhancing the 18 characteristics held by those who might be called upon to carry out forensic accounting action. These two tables are used simultaneously for analytical and comparative purposes.

The analysis focuses on three levels. The first is the single characteristic-samples level that is based on responses of the three samples individually to each characteristic alone. The first level is useful in indicating the position of each sample on a specific

characteristic, thus allowing a comparison on a single characteristic basis across the three samples. The second is the single sample-characteristics level that is based on the responses of a single sample to characteristics individually which would make possible a comparison of a single sample's position on characteristics individually, i.e., comparing the position of the same sample on different characteristics. The third is the aggregated characteristics level represented by the aggregated responses of a single sample to a group of characteristics and to all characteristics. Thus, the third level allows three types of comparison. These are comparison among groups within each sample, comparison among groups across samples and comparison across samples based on all characteristics together. The first comparison allows checking the role by either accounting literature or professional training on groups of characteristics within each sample alone. The second comparison allows comparing the role by either accounting literature or professional training for each group of characteristics across samples. The third comparison allows comparing the role by either accounting literature or professional training across samples as well as comparing between the roles of accounting literature and professional training across samples. The third comparison is based on the aggregated responses¹⁴ to all characteristics which is very important because the 18 characteristics can be looked upon as what is collectively required by a forensic accountant in running an investigation on disputed accounting case.

The responses to a role by accounting literature related to the ethical dimension group of characteristics show a mixed reaction (Table 4). Based on the single characteristic-samples level, the three samples have a unanimous agreement on a role by accounting literature in enhancing the faithful representation characteristic (V7). A role by accounting literature in enhancing the neutrality/impartiality characteristic (V5) is accepted only by the academics' sample. Unlike the responses of both the accountants and the auditors' samples, the academics' sample assigns a great role by accounting literature in enhancing the five characteristics. This can be interpreted in the light of the emphasis given in the financial accounting literature to the first four characteristics. The acceptance by the academics' sample of a role by accounting literature in enhancing awareness about conflict of interest (V11) indicates consistency in their responses and the task of crosschecking responses is accomplished. This is because V11 embodies the other four characteristics within the ethical dimension group. At the group level, the responses of the accountants and the academics' samples would accept a role by accounting literature in enhancing the characteristics included within the ethical dimension group.

The responses related to a role by practical training in enhancing the characteristics included within the ethical dimension group have more unanimity at the three levels (Table 5) than are the responses related to a role by accounting literature (Table 4). First of all, 13 out of 15 sets of responses (86.7%) generate mean values above four including three sets of responses by the academics. Unanimity of agreement at a single characteristic-samples level is reflected by the mean and z-values of responses to neutrality/impartiality (V5), independence (V6) and awareness about conflict of interest (V11). At the single sample-characteristics level, there is also another unanimity related to the responses by both the accountants and the auditors' samples to the five characteristics. At the group level, all samples' responses generate mean values of 4.439, 4.585 and 3.753, respectively with z-values above 1.645.

Table 4 Role of the accounting literature

| <i>Characteristics</i> | <i>Samples</i> | | <i>Accountants</i> <i>N* = 35</i> | | <i>Auditors</i> <i>N = 39</i> | | <i>Academics</i> <i>N = 33</i> | |
|---|----------------|-------------|--------------------------------------|----------|----------------------------------|----------|-----------------------------------|----------|
| | <i>M**</i> | <i>Z***</i> | <i>M</i> | <i>Z</i> | <i>M</i> | <i>Z</i> | <i>M</i> | <i>Z</i> |
| Ethical dimension group | | | | | | | | |
| V5 Neutrality/impartiality | 1.971**** | -3.993 | 2.256 | -10.498 | 3.758 | 3.412 | | |
| V6 Independence | 3.171 | 0.7340 | 3.718 | 9.830 | 4.242 | 5.392 | | |
| V7 Faithful representation | 4.143 | 5.351 | 3.744 | 10.498 | 4.091 | 4.549 | | |
| V8 Objectivity | 3.800 | 3.357 | 1.949 | -4.986 | 4.091 | 4.101 | | |
| V11 Awareness about conflict of interest | 4.514 | 11.470 | 2.974 | -0.183 | 4.030 | 5.363 | | |
| Group level (aggregated) | 3.520 | 4.398 | 2.928 | -0.1.830 | 4.042 | 10.127 | | |
| Economic rationality (rationality) group | | | | | | | | |
| V1 Accuracy | 1.828 | -5.013 | 4.231 | 11.518 | 3.121 | 0.380 | | |
| V3 Utilising time efficiently | 3.200 | 0.7130 | 1.513 | -16.707 | 2.121 | -4.933 | | |
| V4 Minimum paid cost | 3.428 | 1.690 | 1.333 | -14.114 | 4.000 | 4.127 | | |
| V9 Materiality thinking | 2.829 | -1.063 | 4.205 | 8.156 | 2.212 | -3.376 | | |
| Group level | 2.821 | -1.396 | 2.821 | -1.419 | 2.864 | -0.976 | | |
| Receptivity and judgement group | | | | | | | | |
| V2 Patience and care | 3.057 | 0.2360 | 1.821 | -6.571 | 3.091 | 0.356 | | |
| V10 Communication and dialogue | 4.314 | 7.210 | 4.769 | 25.886 | 1.849 | -7.305 | | |
| V12 Semantic interpretation | 3.943 | 3.469 | 4.462 | 12.080 | 4.546 | 10.663 | | |
| V13 Logical sequence and connectivity | 4.200 | 6.269 | 4.615 | 17.097 | 2.394 | -2.734 | | |
| V14 Cognitive awareness | 4.286 | 5.867 | 4.077 | 4.795 | 2.424 | -2.268 | | |
| Group level | 3.960 | 9.129 | 3.949 | 9.279 | 2.861 | -1.177 | | |
| Systems oriented group | | | | | | | | |
| V17 Exact identification of constituents | 4.429 | 10.373 | 4.359 | 12.010 | 1.818 | -9.339 | | |
| V15 Systems approach | 3.657 | 3.210 | 2.180 | -4.670 | 2.697 | -1.715 | | |
| V16 Complementary and interrelated functions | 4.429 | 7.935 | 4.205 | 7.128 | 2.273 | -3.807 | | |
| Group level | 4.171 | 10.953 | 3.581 | 4.539 | 2.263 | -7.221 | | |
| Continuous self-education group | | | | | | | | |
| V18 Knowledge self-acquisition | 4.514 | 14.633 | 4.128 | 8.460 | 4.000 | 4.195 | | |
| All characteristics (aggregated) | 3.600 | 9.712 | 3.365 | 6.759 | 3.153 | 2.410 | | |

Notes: N* = Sample size. M** = mean value. Z*** = Z-value (z-critical one-tail 1.645 where $\mu > 3$; z-value = $[(\mu - 3) / (\sigma/\sqrt{n})]$). ****Figures in all tables are rounded to three fractional numbers. The z-values are used for hypothesis for the differences between the mean of responses.

Table 5 Role of professional training

| <i>Characteristics</i> | <i>Samples</i> | | <i>Accountants</i> <i>N = 35</i> | | <i>Auditors</i> <i>N = 39</i> | | <i>Academics</i> <i>N = 33</i> | |
|--|----------------|----------|-------------------------------------|----------|----------------------------------|----------|-----------------------------------|----------|
| | <i>M</i> | <i>Z</i> | <i>M</i> | <i>Z</i> | <i>M</i> | <i>Z</i> | <i>M</i> | <i>Z</i> |
| Ethical dimension group | | | | | | | | |
| V5 Neutrality/impartiality | 4.229 | 6.377 | 4.615 | 13.496 | 4.030 | 4.288 | | |
| V6 Independence | 4.114 | 4.748 | 4.282 | 6.270 | 4.212 | 10.000 | | |
| V7 Faithful representation | 4.429 | 7.935 | 4.308 | 6.380 | 2.242 | -3.231 | | |
| V8 Objectivity | 4.571 | 9.220 | 4.897 | 26.514 | 2.909 | -0.423 | | |
| V11 Awareness about conflict of interest | 4.400 | 14.976 | 4.821 | 25.185 | 4.515 | 7.762 | | |
| Group level (aggregated) | 4.349 | 16.735 | 4.585 | 23.496 | 3.753 | 5.052 | | |
| Economic rationality group | | | | | | | | |
| V1 Accuracy | 4.229 | 6.106 | 4.308 | 10.660 | 4.030 | 4.288 | | |
| V3 Utilising time efficiently | 4.143 | 5.795 | 4.385 | 12.155 | 3.939 | 5.245 | | |
| V4 Minimum paid cost | 4.400 | 8.234 | 4.897 | 38.553 | 3.182 | .6410 | | |
| V9 Materiality thinking | 4.600 | 10.357 | 4.846 | 21.354 | 1.939 | -7.053 | | |
| Group level | 4.343 | 14.739 | 4.609 | 30.533 | 3.273 | 2.084 | | |
| Receptivity and judgement group | | | | | | | | |
| V2 Patience and care | 4.486 | 8.234 | 4.536 | 19.024 | 4.242 | 16.400 | | |
| V10 Communication and dialogue | 4.429 | 7.935 | 4.897 | 38.553 | 4.182 | 6.695 | | |
| V12 Semantic interpretation | 4.571 | 14.201 | 4.949 | 38.000 | 3.849 | 4.346 | | |
| V13 Logical sequence and connectivity | 3.714 | 3.380 | 3.513 | 2.061 | 4.061 | 4.695 | | |
| V14 Cognitive awareness | 4.086 | 5.599 | 4.256 | 7.702 | 4.333 | 6.739 | | |
| Group level | 4.257 | 15.232 | 4.430 | 19.589 | 4.152 | 13.92 | | |
| Systems oriented group | | | | | | | | |
| V17 Exact identification of constituents | 4.400 | 8.234 | 4.539 | 12.716 | 4.394 | 7.360 | | |
| V15 Systems approach | 3.886 | 5.822 | 4.051 | 4.317 | 4.303 | 6.964 | | |
| V16 Complementary and interrelated functions | 3.600 | 2.177 | 3.564 | 2.913 | 3.758 | 3.796 | | |
| Group level | 3.962 | 7.853 | 4.051 | 9.036 | 4.152 | 10.156 | | |
| Continuous self-education group | | | | | | | | |
| V18 Knowledge self-acquisition | 4.571 | 13.316 | 4.615 | 20.468 | 4.212 | 12.769 | | |
| All characteristics (aggregated) | 4.252 | 27.323 | 4.462 | 39.843 | 3.796 | 14.681 | | |

There is a weak confidence in a role by accounting literature in enhancing the characteristics included within the economic rationality group (Table 4). This occurs at all levels. There is neither a positively unanimous agreement among the three samples on

any of the four characteristics included within the economic rationality group (single characteristic-samples level) nor any agreement on all characteristics by a single sample (single sample-characteristics level). The best responses across the three samples are those given by both the accountants' sample ($M = 3.428$; $Z = 1.690$) and academics' sample ($M = 4.000$; $Z = 4.127$) to a role by accounting literature in enhancing V4 (minimum paid cost). The best responses based on the single characteristic-samples level are those given by the auditors' sample to V1 (accuracy, $M = 4.231$; $Z = 11.518$) and V9 (materiality thinking, $M = 4.205$; $Z = 8.156$). At the group level, the mean values of the responses by the three samples are below three indicating an overall rejection of a role by accounting literature in enhancing the characteristics included within the economic rationality group.

There is a totally different confidence in a role by professional training in enhancing the characteristics included within the economic rationality group at the three levels (Table 5). At the single characteristic-samples level, the responses to V1 (accuracy) and V3 (utilising time efficiently) indicate a unanimous agreement among the three samples. At the same level, there is also an agreement by the responses of both the accountants and auditors' samples on V4 (minimum paid cost) and V9 (materiality thinking). Thus, 10 out of 12 (83.3%) sets of responses generate mean and z-values that indicate an acceptance at the single characteristic-samples level of a role by professional training in enhancing the characteristics included within the economic rationality group. At the single sample-characteristics level, both the accountants and auditors' samples unanimously accept a role by professional training in enhancing the four characteristics included within the economic rationality group. The academics' sample accepts a role by professional training in the case of V1 and V3 and rejects such a role in the case of V4 and V9. At the group level, the responses of the three samples generate mean and z-values that indicate a positive role by professional training related to the economic rationality group.

A mixed reaction to a role by accounting literature in enhancing the characteristics included within the receptivity and judgement group (Table 4). At the single characteristic-samples level, there are two types of unanimous agreements; negative and positive. The negative one is related to V2 (patience and care) and the positive one is related to V12 (semantic interpretation). The responses by the three samples to these two characteristics are logical. The ability of any literature to enhance better semantic interpretation cannot be denied. On the other hand, the ability of any professional training (Table 5) to raise the level of patience and care adopted by any professional is a fact of life. The day-by-day encounters and challenges at any workplace generally improve the level of patience and care by those running assigned duties. Thus, the responses of the three samples to a role by accounting literature in being passive in the case of V2 and in being positive in the case of V12 could be considered as a crosschecking on the consistency of responses. In addition, their negative responses to a role by accounting literature in the case of enhancing V2 and their positive responses to a role by professional training in the case of enhancing the same characteristic can be considered as a crosschecking on the objectivity of their responses since their different positions on the two cases reflect facts of life. As for a role by accounting literature in enhancing the remaining three characteristics V10 (communication and dialogue), V13 (logical sequence and connectivity) and V14 (cognitive awareness), the accountants and auditors' samples generate responses with mean and z-values that indicate a positive position. At the single sample-characteristics level, the responses by both the accountants

and auditors' samples to a role by accounting literature related to the receptivity and judgement group are far better than the responses by the academics' sample. The academics' sample accepts a role by accounting literature only in the case of V12. Except the case of V2, the responses of both the accountants and auditors' samples indicate an acceptance of such a role by accounting literature in enhancing the remaining four characteristics. At the group level, the responses by both the accountants and auditors' samples indicate assigning a positive role by the accounting literature as reflected by the mean and z-values. On the other hand, the responses by academics' sample indicate assigning a negative role by accounting literature which is reflected by the mean and z-values at the group level. It is very sad to have such a weak role assigned by the academics' sample to the accounting literature.

There is a totally different attitude by the three samples when asked about a role of professional training in enhancing the characteristics included within the receptivity and judgement group (Table 5). The statistics at the single characteristic-samples level, single sample-characteristics level and group level indicate a very clear faith in professional training in enhancing the characteristics included within the receptivity and judgement group.

There is no unanimous agreement at the single characteristic-samples level on a role by accounting literature in enhancing the characteristics included within the systems approach group (Table 4). The best responses at the single characteristic-samples level are those by the accountants and auditors' sample to V17 (exact identification of constituents) and V16 (complementary and interrelated functions). At the single sample-characteristics level, there are two types of unanimous responses; positive and negative. The positive responses are those by the accountants' sample to all characteristics included within this group. On the other hand, the responses by the academics' sample to the three characteristics included within the systems approach group indicate a rejection of such a role. At the group level, the responses by the accountants and auditors' samples show an acceptance of a role by accounting literature in enhancing the characteristics included within the systems approach characteristics. Thus, an overall reaction by the academics' sample to a role by accounting literature in enhancing the characteristics included within the systems group is a disappointing one.

Again, there is a totally different attitude by the three samples at the three levels to a role by professional training in enhancing the characteristics included within the systems approach group at the three levels (Table 5).

All samples show a good level of confidence in a role by both accounting literature and professional training in enhancing knowledge self-acquisition characteristic. Finally, the aggregated responses by all samples reflect a unanimous agreement on a role by both the accounting literature and professional training in generally enhancing the 18 characteristics (the bottom of Tables 4 and 5) with a greater role given to the professional training by the three samples than that given to a role by accounting literature.

It is obvious from the statistics in Tables 4 and 5 that, as far as the responses by the academics' sample are concerned, professional training in Iraq has supremacy over accounting literature in enhancing the 18 characteristics held by a forensic accountant. There are only two groups of characteristics for which the statistics indicate an adequate role by accounting literature; these are ethical dimension and continuous self-education groups. The reason for such a positive role by the accounting literature in enhancing the

characteristics included within the ethical dimension group is that almost all financial accounting textbooks include chapters or at least sections on normative characteristics of accounting including those related to an ethical dimension. Regardless of the approach adopted in presenting these normative characteristics to accounting students (to be discussed in the next paragraph), their mere prominent location in various financial accounting textbooks lead even the auditors' and academics' samples¹⁵ to have confidence in the accounting literature in enhancing the characteristics included in the ethical dimension group.

However, statistics in Tables 4 and 5 almost indicate supremacy of the professional training over accounting literature in enhancing the 18 characteristics to be held a forensic accountant.

The most important question is: what does explain this almost lamented situation of the accounting literature? There are two groups of explanation. The first group is related to the approach to teaching in Iraq generally. The second group is related to the approach to teaching accounting in Iraq. The first group indicates that teaching in Iraq strongly adheres to description and indoctrination. These features in no way can be considered conducive to a reasonable economic mentality, adequate receptivity and judgement and systems thinking abilities. It would be near impossibility for a teaching approach characterised by mere description and indoctrination to create a mentality with, for example, utilising time efficiently, properly understanding and adhering to materiality thinking, having semantic interpretation abilities, consideration for logical sequence and connectivity among sentences, events and conclusions, diagnosing exact constituents in a setting having a disputed accounting matter and the required abilities to see how and why functions are complementary and interrelated.

As for the approach to teaching accounting, there are added negative features in addition to those related to teaching generally. The bulk of accounting literature for teaching purpose is mainly based on accounting textbooks (in Arabic as well as in English) which usually lack a critical and analytical approach. It is this source of accounting literature that dominates the teaching process and knowledge self-acquisition. Thus, there is a complete absence of reflective thinking. What dominates is a complete focus on figures as though accounting as a science is about addition, subtraction, multiplication and division of figures without the slightest possibility of having a mental judgement behind these figures. The teaching of accounting is merely concerned about the pseudo accuracy reflected by an emphasis on numerical accuracy of the routine calculative processes, the exact location of the accounts on the debit and the credit sides, and the elegance and neatness of the income statement and balance sheet. The pseudo accuracy is indoctrinated as a final and sole objective.

It seems that the academics' position in Iraq reflected by the statistics in Table 4 are fully aware about the limited abilities of the accounting literature in enhancing the characteristics included within the economic mentality, receptivity and judgement and systems-oriented groups.

9.1.2 Summary statistics

Using statistics in Tables 4 and 5, four more tables (Tables 6, 7, 8 and 9) are developed to show various summary statistics for further comparisons. Table 6 shows comparative statistics on a role by both accounting literature and professional training. This

comparison employs the number of sets of mean and z-values for enhanced and unenhanced characteristics by both accounting literature and professional training.

Table 6 Number of sets of mean and z-values indicating enhanced and unenhanced* characteristics for each group

| <i>Accounting literature and professional training</i> | <i>Accounting literature</i> | | <i>Total</i> |
|--|---|---|--------------|
| | <i>Number of sets of mean and z-values for enhanced characteristics</i> | <i>Number of sets of mean and z-values for unenhanced characteristics</i> | |
| <i>Groups</i> | | | |
| Ethical dimension | 11 | 4 | 15** |
| Economic rationality | 4 | 8 | 12 |
| Receptivity and judgement | 9 | 6 | 15 |
| Systems oriented | 5 | 4 | 9 |
| Continuous self-education | 3 | 0 | 3 |
| Total | 32 | 22 | 54 |

| <i>Accounting literature and professional training</i> | <i>Professional training</i> | | <i>Total</i> |
|--|---|---|--------------|
| | <i>Number of sets of mean and z-values for enhanced characteristics</i> | <i>Number of sets of mean and z-values for unenhanced characteristics</i> | |
| <i>Groups</i> | | | |
| Ethical dimension | 13 | 2 | 15 |
| Economic rationality | 10 | 2 | 12 |
| Receptivity and judgement | 15 | 0 | 15 |
| Systems oriented | 9 | 0 | 9 |
| Continuous self-education | 3 | 0 | 3 |
| Total | 50 | 4 | 54 |

Notes: *In the context of this paper, ‘enhanced’ means that a group of characteristics that are positively impacted by professional training and accounting literature. Then, ‘unenhanced’ means that a group of characteristics are not positively impacted by professional training and accounting literature.

**When multiplying the number of characteristics (5) within the ethical dimension group by the number of samples (3) the result is 15 sets of mean and z-values. Each set indicates whether the responses by a specific sample accept or reject a role by accounting literature or professional training in enhancing a specific characteristic. The three samples’ responses result in having 11 enhanced characteristics by the accounting literature with the mean and z-values that are above 3 and 1.645, respectively. The remaining four characteristics are unenhanced by the accounting literature.

The statistics in Table 6 clearly indicate a greater role by professional training at both the group level and total level.

Table 7 also seeks a comparison of the position of the three samples. However, the comparison here is based on the group level. Again, the statistics in Table 7 clearly indicate a greater role by professional training at the group level as well as at the total level in enhancing the 18 characteristics.

Table 7 Number of sets of mean and z-values indicating enhanced and unenhanced groups of characteristics

| <i>Accounting literature and professional training</i> | <i>Accounting literature</i> | | <i>Total</i> |
|--|---|--|--------------|
| | <i>Number of sets of M and z-values for an enhanced group</i> | <i>Number of sets of mean and z-values for an unenhanced group</i> | |
| <i>Groups</i> | | | |
| Ethical dimension | 2 | 1 | 3* |
| Economic rationality | 0 | 3 | 3 |
| Receptivity and judgement | 2 | 1 | 3 |
| Systems oriented | 2 | 1 | 3 |
| Continuous self-education | 3 | 0 | 3 |
| Total | 9 | 6 | 15 |

| <i>Accounting literature and professional training</i> | <i>Professional training</i> | | <i>Total</i> |
|--|--|--|--------------|
| | <i>Number of sets of mean and z-values for an enhanced group</i> | <i>Number of sets of mean and z-values for an unenhanced group</i> | |
| <i>Groups</i> | | | |
| Ethical dimension | 3 | 0 | 3 |
| Economic rationality | 3 | 0 | 3 |
| Receptivity and judgement | 3 | 0 | 3 |
| Systems oriented | 3 | 0 | 3 |
| Continuous self-education | 3 | 0 | 3 |
| Total | 15 | 0 | 15 |

Notes: *For example, Table 5 shows that the aggregated responses to the ethical dimension group result in having the auditors and academics' samples assign a role for accounting literature in enhancing the ethical dimension group. On the other hand, the accountants' sample assigns no such role.

Table 8 shows statistics related to the number of sets of mean and z-values for enhanced and unenhanced characteristics by both accounting literature and professional training at a sample level. An interesting observation is that of the position of the academics' sample which reflects a preference for a role by professional training over a role by accounting literature in enhancing common life-based characteristics. The position of both the accountants and auditors' samples on a role by accounting literature is in favour of assigning such a role.

Table 9 shows statistics related to the number of sets of mean and z-values for enhanced and unenhanced group of characteristics by both accounting literature and professional training at a sample level. Based on grand total statistics (the bottom of Table 9), accounting literature enhances seven groups as opposed to eight unenhanced groups, whereas professional training enhances 13 groups as opposed to two unenhanced groups.

Table 8 Number of sets of mean and z-values indicating enhanced and unenhanced characteristics (each sample alone)

| <i>Groups</i> | <i>Acc. lit. and professional training</i> | <i>Accounting literature</i> | | <i>Total</i> |
|---------------|--|---|---|--------------|
| | | <i>Number of sets of mean and z-values for enhanced characteristics</i> | <i>Number of sets of mean and z-values for unenhanced characteristics</i> | |
| Accountants | | 12 | 6 | 18 |
| Auditors | | 11 | 7 | 18 |
| Academics | | 8 | 10 | 18 |
| Total | | 31 | 54 | 54 |

| <i>Groups</i> | <i>Accounting literature and professional training</i> | <i>Professional training</i> | | <i>Total</i> |
|---------------|--|---|---|--------------|
| | | <i>Number of sets of mean and z-values for enhanced characteristics</i> | <i>Number of sets of mean and z-values for unenhanced characteristics</i> | |
| Accountants | | 18 | 0 | 18 |
| Auditors | | 18 | 0 | 18 |
| Academics | | 14 | 4 | 18 |
| Total | | 50 | 4 | 54 |

Table 9 Number of sets of mean and z-values indicating enhanced and unenhanced groups of characteristics for each sample

| <i>Samples and group of characteristics</i> | | <i>Accounting literature</i> | | <i>Professional training</i> | |
|---|----------------------------|------------------------------|-------------------|------------------------------|-------------------|
| | | <i>Enhanced</i> | <i>Unenhanced</i> | <i>Enhanced</i> | <i>Unenhanced</i> |
| Accountants | Ethical dimension | | X | ✓ | |
| | Economic rationality | | X | ✓ | |
| | Receptivity and judgement | ✓ | | ✓ | |
| | Systems oriented | ✓ | | ✓ | |
| | Self-acquisition knowledge | ✓ | | ✓ | |
| Sub-total | | 3 | 2 | 5 | 0 |
| Auditors | Ethical dimension | | X | ✓ | |
| | Economic rationality | | X | ✓ | |
| | Receptivity and judgement | ✓ | | ✓ | |
| | Systems oriented | | X | ✓ | |
| | Self-acquisition knowledge | ✓ | | ✓ | |
| Sub-total | | 2 | 3 | 5 | 0 |
| Academics | Ethical dimension | ✓ | | | X |
| | Economic rationality | | X | | ✓ |
| | Receptivity and judgement | | X | ✓ | |
| | Systems oriented | | X | ✓ | |
| | Self-acquisition knowledge | ✓ | | ✓ | |
| Sub-total | | 2 | 3 | 3 | 2 |
| Grand total | | 7 | 8 | 13 | 2 |

9.1.3 Analysis based on Kruskal-Wallis test and Mann-Whitney tests

Based on the Kruskal-Wallis test, Table 10 shows the variables on which there are statistically significant differences among the three samples. There are 16 out of 18 variables which generate statistically significant differences (p -value is less than 0.05¹⁶) among the three samples based on their responses to a role by accounting literature. On the other hand, there are 12 out of 18 variables which generate statistically significant differences among the three samples based on their responses to a role by professional training. This gives an initial conclusion, albeit cautious, that there is higher agreement among the three samples on a role by professional training since the number of variables for which there are statically significant differences is less than that generated by accounting literature. However, the problem with the Kruskal-Wallis test is that it does not give an important piece of information related to which of the samples is statistically significantly different from one another (Pallant, 2011). The Mann-Whitney test can be of help in this regard.

Table 10 Results of Kruskal-Wallis test for accounting literature and professional training (three separate samples)

| <i>Accounting literature</i> | | <i>Professional training</i> | | <i>Accounting literature</i> | | <i>Professional training</i> | |
|------------------------------|-----------------------------|------------------------------|-----------------------------|------------------------------|-----------------------------|------------------------------|-----------------------------|
| <i>Var. no.</i> | <i>p-value (one-tailed)</i> | <i>Var. no.</i> | <i>p-value (one-tailed)</i> | <i>Var. no.</i> | <i>p-value (one-tailed)</i> | <i>Var. no.</i> | <i>p-value (one-tailed)</i> |
| V1 | 0.0000 | V1 | 0.7830 | V10 | 0.000 | V10 | 0.0010 |
| V2 | 0.000 | V2 | 0.0020 | V11 | 0.000 | V11 | 0.0010 |
| V3 | 0.000 | V3 | 0.1350 | V12 | 0.584 | V12 | 0.0000 |
| V4 | 0.000 | V4 | 0.0000 | V13 | 0.000 | V13 | 0.1830 |
| V5 | 0.000 | V5 | 0.0790 | V14 | 0.000 | V14 | 0.3920 |
| V6 | 0.000 | V6 | 0.0600 | V15 | 0.000 | V15 | 0.0160 |
| V7 | 0.010 | V7 | 0.0000 | V16 | 0.000 | V16 | 0.5370 |
| V8 | 0.000 | V8 | 0.0000 | V17 | 0.000 | V17 | 0.9560 |
| V9 | 0.000 | V9 | 0.000 | V18 | 0.213 | V18 | 0.0030 |

Table 11 Results of Mann-Whitney test: the role of accounting literature/three samples (accountants, auditors and academics)

| <i>Samples and variables</i> | <i>P (2-tailed)</i> | <i>Mean rank</i> | | <i>Statistically significantly different sample</i> |
|------------------------------|---------------------|--------------------|-----------------|---|
| | | <i>Accountants</i> | <i>Auditors</i> | |
| V1 | 0.000 | 22.300 | 51.140 | Auditors |
| V2 | 0.001 | 45.660 | 30.180 | Accountants |
| V3 | 0.000 | 48.340 | 27.770 | Accountants |
| V4 | 0.000 | 51.640 | 24.810 | Accountants |
| V5 | 0.001 | 29.270 | 44.880 | Auditors |
| V7 | 0.001 | 45.760 | 30.090 | Accountants |
| V8 | 0.000 | 50.640 | 25.710 | Auditors |
| V9 | 0.000 | 24.340 | 49.310 | Auditors |
| V10 | 0.097 | 33.990 | 40.650 | Auditors |
| V11 | 0.000 | 52.740 | 23.820 | Accountants |
| V15 | 0.000 | 49.530 | 26.710 | Accountants |

Table 11 Results of Mann-Whitney test: the role of accounting literature/three samples (accountants, auditors and academics) (continued)

| <i>Samples and variables</i> | <i>P</i> <i>(2-tailed)</i> | <i>Mean rank</i> | | <i>Statistically significantly different sample</i> |
|----------------------------------|-------------------------------|--------------------|------------------|---|
| | | <i>Accountants</i> | <i>Academics</i> | |
| <i>Accountants and academics</i> | | | | |
| V1 | 0.002 | 27.700 | 41.710 | Academics |
| V3 | 0.008 | 40.500 | 28.140 | Accountants |
| V4 | 0.056 | 30.290 | 38.970 | Academics |
| V5 | 0.000 | 24.030 | 45.610 | Academics |
| V6 | 0.000 | 25.500 | 44.050 | Academics |
| V9 | 0.011 | 40.160 | 28.500 | Accountants |
| V10 | 0.000 | 48.510 | 19.640 | Accountants |
| V11 | 0.028 | 39.140 | 29.580 | Accountants |
| V13 | 0.000 | 45.690 | 22.640 | Accountants |
| V14 | 0.000 | 45.060 | 23.300 | Accountants |
| V15 | 0.002 | 41.460 | 27.120 | Accountants |
| V16 | 0.000 | 47.140 | 21.090 | Accountants |
| V17 | 0.000 | 50.310 | 17.730 | Accountants |
| <i>Auditors and academics</i> | | <i>Auditors</i> | <i>Academics</i> | |
| V1 | 0.078 | 40.310 | 32.000 | Auditors |
| V2 | 0.000 | 28.210 | 46.300 | Academics |
| V3 | 0.010 | 31.090 | 42.890 | Academics |
| V4 | 0.000 | 22.260 | 53.330 | Academics |
| V5 | 0.000 | 25.910 | 49.020 | Academics |
| V6 | 0.000 | 27.730 | 46.860 | Academics |
| V7 | 0.001 | 29.600 | 44.650 | Academics |
| V8 | 0.000 | 24.580 | 50.590 | Academics |
| V9 | 0.000 | 48.560 | 22.240 | Auditors |
| V10 | 0.000 | 52.270 | 17.860 | Auditors |
| V11 | 0.000 | 26.970 | 47.760 | Academics |
| V13 | 0.000 | 49.990 | 20.560 | Auditors |
| V14 | 0.000 | 45.620 | 25.730 | Auditors |
| V15 | 0.023 | 31.540 | 42.360 | Academics |
| V16 | 0.000 | 48.580 | 22.230 | Auditor |
| V17 | 0.000 | 52.240 | 17.890 | Auditors |

Based on the results shown in Table 10 a Mann-Whitney test (Tables 11 and 12) is run for a pair of samples. Since we have three samples then three Mann-Whitney tests $[(3*2) / 2]$ are run for accounting literature and the same number of tests is run for professional training for variables that generate statistically significant differences.

Table 12 Results of Mann-Whitney test: the role of practical training/three samples (accountants, auditors and academics)

| <i>Samples and variables</i> | <i>P</i> <i>(2-tailed)</i> | <i>Mean rank</i> | | <i>The statistically significantly different sample</i> |
|----------------------------------|-------------------------------|--------------------|------------------|---|
| | | <i>Accountants</i> | <i>Auditors</i> | |
| <i>Accountants and auditors</i> | | | | |
| V4 | 0.005 | 32.030 | 42.410 | Auditors |
| V5 | 0.055 | 33.210 | 41.350 | Auditors |
| V8 | 0.031 | 34.130 | 40.530 | Auditors |
| V9 | 0.083 | 34.670 | 40.040 | Auditors |
| V10 | 0.032 | 33.640 | 40.960 | Auditors |
| V11 | 0.000 | 29.560 | 44.630 | Auditors |
| V12 | 0.001 | 31.440 | 42.940 | Auditors |
| V15 | 0.019 | 31.700 | 42.710 | Auditors |
| <i>Accountants and academics</i> | | <i>Accountants</i> | <i>Academics</i> | |
| V2 | 0.001 | 41.200 | 27.390 | Accountants |
| V4 | 0.001 | 42.040 | 26.500 | Accountants |
| V7 | 0.000 | 46.290 | 22.000 | Accountants |
| V8 | 0.000 | 46.790 | 21.470 | Accountants |
| V9 | 0.000 | 49.100 | 19.020 | Accountants |
| V11 | 0.016 | 29.660 | 39.640 | Academics |
| V12 | 0.001 | 41.470 | 27.110 | Accountants |
| V15 | 0.008 | 28.900 | 40.440 | Academics |
| V18 | 0.004 | 40.470 | 28.170 | Accountants |
| <i>Auditors and academics</i> | | <i>Auditors</i> | <i>Academics</i> | |
| V2 | 0.011 | 41.380 | 30.730 | Auditors |
| V4 | 0.000 | 47.580 | 23.410 | Auditors |
| V5 | 0.041 | 40.380 | 31.910 | Auditors |
| V6 | 0.018 | 41.270 | 30.860 | Auditors |
| V7 | 0.000 | 47.620 | 23.360 | Auditors |
| V8 | 0.000 | 51.230 | 19.090 | Auditors |
| V9 | 0.000 | 52.310 | 17.820 | Auditors |
| V10 | 0.000 | 43.670 | 28.030 | Auditors |
| V12 | 0.000 | 48.380 | 22.450 | Auditors |
| V18 | 0.002 | 42.540 | 29.360 | Auditors |

Notes: The sample with the higher mean rank is chosen as the statistically significantly different sample. There is nothing precludes from using the lower mean rank for choosing the statistically significantly different sample. All conclusions would be more or less the same. However, the phrasing of various arguments is definitely different.

Two conclusions can be drawn from Table 11. First, the agreement between the accountants' and the auditors' samples on a role by accounting literature is higher (there are 11 variables with statistically significant differences) than the agreement between the accountants and academics' samples (there are 13 variables with statistically significant differences) and between the auditors' and academics' samples (there are 16 variables with statistically significant differences). Second, the most noticeable observation in Table 11 is the results derived for the accountants and academics' samples. Contrary to what one expects from the academics' position on a role by accounting literature, it seems that they are less enthusiastic about this role in enhancing the characteristics for forensic accounting purpose as reflected by the number of higher mean ranks associated with each sample (nine for the accountants' sample vis-à-vis four for the academics' sample) taking into consideration that the 18 questions/variables are formulated in an affirmative style.

Statistics in Table 12 reflect at least three conclusions. First, the agreement on a role for professional training by the accountants' and the auditors' samples is higher (there are eight variables with statistically significant differences) than the agreement between the accountants' and academics' samples (there are nine variables with statistically significant differences) and between the auditors' and academics' samples (there are ten variables with statistically significant differences). Second, the auditors' sample is very enthusiastic about a role for professional training in enhancing the characteristics for forensic accounting purposes as indicated by the number of higher mean ranks scored for their responses in the case of both the auditors' and accountants' samples and the auditors' and academics' samples. Third, the academics' sample is the least enthusiastic about a role for professional training in enhancing the characteristics for a forensic accountant since only in the case of the accountants and academics' samples there are two variables for which the academics' sample scores higher mean rank.

A comparison between Tables 11 and 12 would lead to two conclusions. First, Table 12 shows smaller total of statistically significant differences (i.e., 27) than those in Table 11 (i.e., 40) indicating more agreement among the three samples on a role by professional training than their agreement on a role by accounting literature. Second, as is reflected by the number of variables for which there are statistically significant differences, Tables 11 and 12 reflect more agreement between the accountants' and auditors' samples (11 variables in Table 9 and eight variables in Table 10) than between the accountants' and academics' samples (13 variables in Table 11 and nine variables in Table 12) and between the auditors' and academics' samples (16 variables in Tables 11 and 10 variables in Table 12).

9.2 Second: analysis based on Mann-Whitney test for each sample

The separate responses by each sample to a role by accounting literature and a role for professional training can be treated as though there are two samples for which a Mann-Whitney test can be used for analysis and comparison purposes.

9.2.1 The accountants' sample

Table 13 indicates that there are eight variables for which there are statistically significant differences and 11 variables for which there are no statistically significant differences. Seven out of the eight variables for which there are statistically significant variables have higher mean ranks generated by the responses of the accountants' sample to a role by professional training and there is one variable with higher mean rank generated by the responses of the accountants' sample to a role by accounting literature. This gives a preference for a role by professional training over a role by accounting literature.

Table 13 Results of M-W test

| <i>Var. no.</i> | <i>p-value (2-tailed)</i> | <i>Mean rank</i> | <i>Statistically significantly different sample</i> | <i>Var. no.</i> | <i>p-value (2-tailed)</i> | <i>Mean rank</i> | <i>Statistically significantly different sample</i> |
|-----------------|---------------------------|------------------|---|-----------------|---------------------------|------------------|---|
| V1 | 0.0000 | 21.970 49.030 | Professional training | V10 | 0.5380 | 34.140 36.860 | No significant difference |
| V2 | 0.0000 | 23.470 47.530 | Professional training | V11 | 0.145 | 38.440 32.560 | No significant difference |
| V3 | 0.390 | 30.710 40.290 | No significant difference | V12 | 0.3510 | 33.540 37.460 | No significant difference |
| V4 | 0.0020 | 28.640 42.360 | Professional training | V13 | 0.0240 | 40.630 30.370 | Accounting literature |
| V5 | 0.0000 | 23.710 47.290 | Professional training | V14 | 0.1310 | 38.790 32.210 | No significant difference |
| V6 | 0.0000 | 26.960 44.040 | Professional training | V15 | 0.6410 | 34.430 36.570 | No significant difference |
| V7 | 0.2350 | 33.000 38.000 | No significant difference | V16 | 0.0470 | 39.790 31.210 | No significant difference |
| V8 | 0.0060 | 29.660 41.340 | Professional training | V17 | 0.8120 | 35.000 36.000 | No significant difference |
| V9 | 0.0000 | 21.410 49.590 | Professional training | V18 | 0.5590 | 34.110 36.890 | No significant difference |

Note: Accounting literature (accountants) compared to professional training (accountants).

9.2.2 The auditors' sample

Table 14 indicates that there are 14 variables for which there are statistically significant differences and four variables for which there are no statistically significant differences. 12 out of the 14 variables for which there are statistically significant differences have higher mean ranks generated by the responses to a role by professional training and two variables for which there are statistically significant differences have higher mean ranks generated by the responses to a role by accounting literature. Again, this gives supremacy to a role by professional training over a role by accounting literature.

Table 14 Results of MW test

| <i>Var. no.</i> | <i>p-value (2-tailed)</i> | <i>Mean rank</i> | <i>The statistically significantly different group</i> | <i>Var. no.</i> | <i>p-value (2-tailed)</i> | <i>Mean rank</i> | <i>The statistically significantly different sample</i> |
|-----------------|---------------------------|------------------|--|-----------------|---------------------------|------------------|---|
| V1 | 0.547 | 37.960 41.040 | No significance difference | V10 | 0.224 | 37.000 42.000 | No significance difference |
| V2 | 0.000 | 22.150 56.850 | Professional training | V11 | 0.000 | 21.380 57.620 | Professional training |
| V3 | 0.000 | 20.060 58.940 | Professional training | V12 | 0.000 | 31.670 47.330 | Professional training |
| V4 | 0.000 | 20.100 58.900 | Professional training | V13 | 0.002 | 46.790 32.210 | Accounting literature |
| V5 | 0.000 | 20.770 58.230 | Professional training | V14 | 0.845 | 39.040 39.960 | No significance difference |
| V6 | 0.000 | 29.640 49.360 | Professional training | V15 | 0.000 | 26.770 52.230 | Professional training |
| V7 | 0.000 | 29.000 50.000 | Professional training | V16 | 0.0005 | 46.170 32.830 | Accounting literature |
| V8 | 0.000 | 20.590 58.410 | Professional training | V17 | 0.169 | 36.260 42.740 | No significance difference |
| V9 | 0.000 | 31.350 47.650 | Professional training | V18 | 0.008 | 33.380 45.620 | Professional training |

Note: Accounting literature (auditors) compared to professional training (auditor).

9.2.3 *The academics' sample*

Table 15 indicates that there are 15 variables for which there are statistically significant differences and three variables for which there are no statistically significant differences. Ten out of the 15 variables for which there are statistically significant differences have higher mean ranks *generated* by the responses to a role by professional training and three variables for which there are statistically significant differences have higher mean ranks generated by the responses to a role by accounting literature. This gives supremacy to a role by professional training over a role by accounting literature.

9.3 *Third: the aggregated sample approach*

9.3.1 *Analysis based on mean and z-values*

As is shown in Table 16 the responses by the accountants, auditors and academics are aggregated in a single sample with a size of 107. This single sample has two groups of responses; the responses to a role by accounting literature and the responses to a role by professional training. Accordingly, these two groups of responses allow considering them as though there were two separate samples. All information in Table 16 is consistent with general tendencies in Tables 4 to 15 in that the professional training has the upper hand in

enhancing common life-based characteristics necessary for running forensic accounting activities. Acceptance is given to the ability of professional training in enhancing the 18 characteristics. The accounting literature has the ability to enhance ten out of 18 characteristics. The worst statistics are those related to the economic rationality group since the accounting literature is denied the ability to enhance four out of the four characteristics. At the group level, the accounting literature gains the ability in enhancing three groups of characteristics (the ethical dimension, receptivity and judgement, and knowledge self-acquisition). It gains rejection of enhancing two groups of characteristics (i.e., economic rationality and systems oriented).

Table 15 Results of M-W test

| <i>Var. no.</i> | <i>p-value (2-tailed)</i> | <i>Mean rank</i> | <i>Statistically significantly different sample</i> | <i>Var. no.</i> | <i>p-value (2-tailed)</i> | <i>Mean rank</i> | <i>Statistically significantly different sample</i> |
|-----------------|---------------------------|------------------|---|-----------------|---------------------------|------------------|---|
| V1 | 0.063 | 29.440 37.560 | Professional training | V10 | 0.003 | 19.350 47.650 | Professional training |
| V2 | 0.002 | 26.680 40.320 | Professional training | V11 | 0.001 | 27.260 39.740 | Professional training |
| V3 | 0.000 | 20.940 46.060 | Professional training | V12 | 0.000 | 40.760 26.240 | Accounting literature |
| V4 | 0.015 | 38.970 28.030 | Accounting literature | V13 | 0.000 | 23.520 43.480 | Professional training |
| V5 | 0.272 | 31.080 35.920 | No significance difference | V14 | 0.000 | 22.480 44.520 | Professional training |
| V6 | 0.076 | 37.320 29.680 | Accounting literature | V15 | 0.000 | 21.050 45.950 | Professional training |
| V7 | 0.000 | 43.350 23.650 | Accounting literature | V16 | 0.000 | 23.480 43.520 | Professional training |
| V8 | 0.000 | 42.210 24.790 | Accounting literature | V17 | 0.000 | 19.700 47.300 | Professional training |
| V9 | 0.8190 | 34.030 32.970 | No significance difference | V18 | 0.462 | 35.150 31.850 | No significance difference |

Note: Accounting literature (academics) compared to professional training (academics).

9.3.2 Analysis based on Mann-Whitney test

Table 17 shows the results of the Mann-Whitney test based on the responses of all samples (the aggregated single sample) to both accounting literature and professional training. There are 13 variables for which there are statistically significant differences and five variables for which there are no statistically significant differences. All the 13 variables for which there are statistically significant differences have higher mean ranks brought about by the responses to a role by professional training. This gives supremacy for a role by professional training over a role by accounting literature. Thus, there is consistency between results in Table 17 with those in Table 16.

Table 16 Accounting literature (all samples together) compared to professional training (all samples together)

| <i>Characteristics</i> | <i>Two groups of responses based on a single aggregated sample</i> | | <i>The role of accounting literature N = 107</i> | | <i>The role of professional training N = 107</i> | |
|--|--|----------|--|----------|--|----------|
| | <i>M</i> | <i>Z</i> | <i>M</i> | <i>Z</i> | <i>M</i> | <i>Z</i> |
| Ethical dimension group | | | | | | |
| Neutrality/impartiality ⁵ V | 2.626 | -2.808 | 4.308 | 12.091 | | |
| V6 Independence | 3.710 | 6.218 | 4.215 | 10.780 | | |
| V7 Faithful representation | 3.981 | 9.312 | 3.710 | 4.673 | | |
| V8 Objectivity | 3.215 | 1.304 | 4.178 | 9.629 | | |
| V11 Awareness about conflict of interest | 3.804 | 7.370 | 4.589 | 21.505 | | |
| Group level | 3.467 | 7.718 | 4.200 | 22.487 | | |
| Economic rationality group | | | | | | |
| V1 Accuracy | 3.103 | 0.6370 | 4.196 | 11.052 | | |
| V3 Utilising time efficiently | 2.252 | -5.744 | 4.168 | 12.261 | | |
| V4 Minimum paid cost | 2.841 | -0.970 | 4.206 | 9.638 | | |
| V9 Materiality thinking | 3.140 | 1.064 | 3.869 | 5.948 | | |
| Group level | 2.834 | -2.196 | 4.110 | 18.414 | | |
| Receptivity and judgement group | | | | | | |
| V2 Patience and care | 2.617 | -2.719 | 4.430 | 20.309 | | |
| V10 Communication and dialogue | 3.720 | 4.910 | 4.523 | 17.629 | | |
| V12 Semantic interpretation | 4.318 | 11.895 | 4.486 | 17.613 | | |
| V13 Logical sequence and connectivity | 3.794 | 5.902 | 3.748 | 5.572 | | |
| V14 Cognitive awareness | 3.636 | 4.113 | 4.224 | 11.587 | | |
| Group level | 3.617 | 9.331 | 4.282 | 28.064 | | |
| Systems oriented group | | | | | | |
| V17 Exact identification of constituents | 3.598 | 4.399 | 4.449 | 15.873 | | |
| V15 Systems approach | 2.822 | -1.452 | 4.075 | 9.182 | | |
| V16 Complementary and interrelated functions | 3.682 | 4.953 | 3.636 | 4.926 | | |
| Group level | 3.367 | 4.648 | 4.053 | 15.499 | | |
| Continuous self-education group | | | | | | |
| V18 Knowledge self-acquisition | 4.215 | 12.684 | 4.477 | 25.282 | | |
| All characteristics | 3.393 | 11.512 | 4.187 | 44.378 | | |

Table 17 Results of M-W test: accounting literature (academics) compared to professional training (academics)

| <i>Var. no.</i> | <i>p-value (2-tailed)</i> | <i>Mean rank</i> | <i>Statistically significantly different sample</i> | <i>Var. no.</i> | <i>p-value (2-tailed)</i> | <i>Mean rank</i> | <i>Statistically significantly different sample</i> |
|-----------------|---------------------------|------------------|---|-----------------|---------------------------|------------------|---|
| V1 | 0.063 | 29.440 37.560 | Professional training | V10 | 0.003 | 19.350 47.650 | Professional training |
| V2 | 0.002 | 26.680 40.320 | Professional training | V11 | 0.001 | 27.260 39.740 | Professional training |
| V3 | 0.000 | 20.940 46.060 | Professional training | V12 | 0.000 | 40.760 26.240 | Accounting literature |
| V4 | 0.015 | 38.970 28.030 | Accounting literature | V13 | 0.000 | 23.520 43.480 | Professional training |
| V5 | 0.272 | 31.080 35.920 | No significance difference | V14 | 0.000 | 22.480 44.520 | Professional training |
| V6 | 0.076 | 37.320 29.680 | Accounting literature | V15 | 0.000 | 21.050 45.950 | Professional training |
| V7 | 0.000 | 43.350 23.650 | Accounting literature | V16 | 0.000 | 23.480 43.520 | Professional training |
| V8 | 0.000 | 42.210 24.790 | Accounting literature | V17 | 0.000 | 19.700 47.300 | Professional training |
| V9 | 0.8190 | 34.030 32.970 | No significance difference | V18 | 0.462 | 35.150 31.850 | No significance difference |

10 Conclusions

Requirements for a specialty in forensic accounting go beyond adequate acquaintance with and skills in accounting, auditing, law, economics, management, statistics, etc. This specialty needs two sets of requirements: characteristics acquired by any human being through her/his life experiences and skills acquired through accounting literature and professional training. The emphasis on characteristics alone in this paper stems from three facts. First, an absence of an adequate level of these characteristics renders whatever skills held by any expert called upon to conduct forensic accounting action to be useless. Second, these characteristics are not created by academic or professional education and training. However, accounting literature (theory) and professional training (practice) greatly enhance these characteristics. Third, these characteristics are not necessarily enhanced through only attending a program leading to a certificate in forensic accounting. Accounting literature and professional training are supposed to have important roles in enhancing these characteristics throughout the career of those called upon to run a forensic accounting action. Iraq represents a case where forensic accounting activities are increasingly demanded for yet no Iraqi holds a certificate in forensic accounting. Thus, it is fruitful to find out the role played by both accounting literature and professional training in enhancing 18 characteristics chosen in this paper.

The results of the empirical investigation, based on a questionnaire distributed to accountants, auditors and academics as the most important and interested stakeholders in forensic accounting indicate, through various analyses and comparisons, that there is almost undisputed role for professional training in enhancing the 18 characteristics. On the other hand, there is a weak role assigned for accounting literature in enhancing these characteristics. If we accept the position of the academics' sample alone, the role of accounting literature is a disappointing one. If this vital role of literature in enhancing common life-based characteristics is weak, the following question becomes very important: is professional training alone capable of producing a multidisciplinary accountant? The answer is emphatically: NO. Literature in whatever field of inquiry updates our minds about new ideas. These new ideas are, sometimes, very powerful stimuli for creativity. New ideas, in turn, enhance professional training. Professional training alone may lead to stagnation in our thinking. Is this weak role by the accounting literature in enhancing common life-based characteristics related to forensic accounting an Iraqi phenomenon or an accounting literature problem? If it is an Iraqi phenomenon, the accounting education system in Iraq must undergo a major overhaul at various educational levels. This must also include encouraging and motivating Iraqi professionals to review accounting literature on a continuous basis. If it is an accounting literature problem, then the close intimacy between accounting as a social discipline and life experiences from which accounting draws many of its concepts must be questioned. Put differently, is it possible that accounting as a social discipline starts to alienate itself from life experiences which represent accounting's immediate constituency?

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Notes

- 1 Thus, adherence to certain common life-based characteristics and being a multidisciplinary forensic accountant could be regarded synonymous. As matter of fact, the characteristics chosen (see Appendix and Table 1) require a multidisciplinary accountant.
- 2 Few names are enough as a manifestation of genius people holding the four characteristics yet they did not hold certificate(s):
Confucius (551BC–479 BC): ethics, philosophy, politics, management and government (Woods and Lamond, 2011; Gallagher and Rarick, 2001; Hofstede and Bond, 1983; Stanford Encyclopedia of Philosophy, 2016).
Aristotle (384BC–322 BC): physics, biology, zoology, metaphysics, logic, economics, ethics, poetry, theater, music, rhetoric, linguistics, politics and government (Encyclopedia Britannica, 2016a; DesRoches, 2014; Duska, 1993; Finley, 1965).
Archimedes (287 BC–212 BC): mathematics, physics, engineering, invention, and astronomy (Finley, 1965; Hirshfeld, 2009; Encyclopedia Britannica, 2016b).
Al-Khwarizmi (780–850): mathematics, geography, astronomy, and cartography (Clark, 2012; Encyclopedia Britannica; 2016c)
Avicenna (980–1037): medicine, astronomy, alchemy, geography and geology, psychology, Islamic theology, logic, mathematics, physics, education and poetry (Azadpur and Silvers, 2005; Encyclopedia Britannica; 2016d).
- 3 One of cultural roots that influences behaviours at workplace is the Confucian Dynamism related to long-range versus short range planning or mentality thinking about the future (Radebaugh et al., 2006; Broker, 2014). This cultural dimension is originally mentioned by Hofstede (2001).
- 4 The environmental contexts of forensic accounting have two major aspects; a micro and a macro. A micro aspect is related to the interconnections and interdependencies between a specific disputed accounting matter and its own environment. A macro one is related to the environment of forensic accounting in a specific country.
- 5 Statistical theories and techniques can also be added to the other fields included in Huber and DiGabriele’s (2014) definition since “Statistics provides a structured process to synthesize and analyze large amounts of data as well as examines uncertainty” [Dutta, (2013), p.19]. Actually, statistics can greatly improve the inductive capability of a forensic investigator. In turn, the inductively derived result(s) can be added to and strengthen the deductively derived conclusion(s) related to a specific forensic case.
- 6 The influence of various cultural dimensions, collectively and individually, on accounting continue to attract the attention of accounting authors (e.g., Leonard et al., 2010; Al-Mannai and Hindi, 2015; Alfraih et al., 2015).

- 7 A skill is usually something that is known and improved by education or through experience when someone practices activities related to a profession. This definition is almost in agreement with that of Gallagher (2010, p.3) who argues that (..... to be effective in our personal, academic, and work lives we need to be to actually do things – thus, we need to be skilled). Thus, there is no insistence on doing things in a perfect manner. The authors of this paper and the editor of this journal can write an academic article in English. Thus, we and the editor possess a skill of writing in English. The difference is that our modest ability cannot be matched with that of the editor. Learning, experience and accepting criticisms would definitely improve our ability. A characteristic is a human being's feature which requires no education or training to have knowledge of it. That is, a characteristic does not originate in education. For example, communication and dialogue is practiced by all human beings regardless of whether they are educated or not. A baby practices communication and dialogue before he/she is admitted to any officially organised educational program. Therefore, a skill is something created, continuously developed and enhanced by education or profession [see Gallagher (2010) for more detailed discussions on skills]. On the other hand, a characteristic is a product of common life's experiences and held or adopted by any human being regardless of whether he/she is educated or not. It must be emphasised that every human being holds a characteristic with its two concurrent competing counterparts: positive/good and negative/bad. For example, the authors of this paper are faithful and unfaithful, fair and unfair, honest and dishonest, unselfish and selfish, etc. There is no human being who is absolutely faithful, fair, honest, objective, etc. What is hoped is that the magnitude of faithfulness, fairness, honesty, unselfishness, etc. far exceeds unfaithfulness, unfairness, dishonesty, selfishness, etc. It is also hoped that social values, education and professional training augment the magnitude of the positive part and mitigate the negative part. However, the negative part cannot reach a zero level which means that the positive part cannot reach an ideally absolute one.
- 8 Accounting literature, for the purpose of this paper, includes accounting books and articles both in Arabic and English available to accountants through various levels of educationally instructional programs as well as those generally available through electronic sites and subscriptions in journals by individuals and academic and professional accounting bodies in Iraq.
- 9 The influence of culture on common life-based characteristics will be the target of a forthcoming paper by the same authors. A questionnaire on this relationship has already been distributed.
- 10 In various and many aspects of life, a collectively established judgement through opinions of group(s) of experts/stakeholders is an acceptable approach to describe a quality, a performance, a conduct, a behaviour, a sacrifice, an accomplishment, etc. Examples would include the beauty context for miss world, the result of a boxing match, Oscar film winners, Lionel Messi or Cristiano Ronaldo as a world footballer for a year, etc. This collectively established judgement is usually based on a general (majority) tendency. It is a voting with the result based on majority tendency. In a questionnaire for academically published paper, the experts/stakeholders (i.e., voters) are asked to state their opinions by choosing one of the points on the Likert scale (e.g., 1, 2, 3, 4, and 5) with each point has a description (emphasis added) (e.g., strongly agree, agree, neutral, disagree and strongly disagree). Thus, the general tendency in a questionnaire for academic purpose is also based on a type of voting but usually governed by two statistical values: average (mean) and z-value. Above or below a mean value of three accompanied with a comparison between calculated and critical z-values lead to specific general tendency. In the current paper, the general tendency on the capability of a forensic accountant to run forensic activities is based on the opinions of groups of experts (i.e., auditors, accountants and academic accountants). Despite the inaccuracy potential in the individuals' opinions, these groups are the most important and relevant stakeholders in forensic accounting in Iraq. They are supposed to have enough knowledge about the realities or the level of accounting literature and professional training in Iraq. In addition, they are perhaps the only groups in Iraq that can understand the technical, ethical, conceptual implications of the language of the questionnaire used to establish collective judgements. Based on their acquaintance, they must be able to deliver an opinion on the role of accounting literature and professional training in enhancing common life-based characteristics to be held

by a forensic accounting which, in turn, would or would not make a forensic accountant capable of running forensic activities.

- 11 The literatures surveyed include publications by ScienceDirect, Ebscohost, Springer and Emerald. The survey is available through the University of Bahrain’s electronic library.
- 12 Both deduction and induction are adopted by any human being when making various decisions, judgements and conclusions. Most people in the overwhelming majority of situations use deduction and induction subconsciously and intuitively. A forensic investigation is about a disputed matter involving many different aspects that must be sequentially and logically connected in order to arrive at a naturally derived conclusion. Thus, a good forensic investigator is the one who possesses the faculty/talent of using both induction and deduction. The well-known Sherlock Holmes’ investigation case is that of arriving at a deductively derived conclusion that the horse was stolen by someone the dog knew well since it did not bark during a night-time. The reaction of the dog as a generalisation is based on an inductive inference.
- 13 It is actually very risky and hazardous to distribute a questionnaire even in Baghdad. All copies of the distributed questionnaire were personally handed over by the first author of this paper (i.e., from hand to hand).
- 14 The aggregation is made by adding the responses by a single sample to all variables.
- 15 At the aggregated level, Table 4 shows that the mean value of the responses of the accountants’ sample (i.e., 2.928) is not far away from 3.
- 16 If we are dealing with a one-tailed distribution then a *p*-value of less than 0.05 indicates a statistically significant difference among the means of the three samples. If we are dealing with a two-tailed distribution then a *p*-value of less than 0.10 indicates a statistically significant difference among the means of the three samples.

Appendix

Table A1 The questionnaire

| <i>Characteristics</i> | <i>Enhanced through</i> | <i>Questions/variables</i> |
|------------------------|-------------------------|---|
| 1 (Accuracy) | Accounting literature | A. The accountant possesses knowledge and understandability through accounting literature which qualifies her/him as a forensic expert when investigating a disputed accounting matter with accuracy. |
| | Professional training | B. The accountant possesses knowledge and understandability through professional training which qualify her/him as a forensic expert investigating a disputed accounting matter with accuracy. |
| 2 (Patience and care) | Accounting literature | A. The accountant possesses knowledge and understandability through accounting literature which qualifies her/him as a forensic expert investigating a disputed accounting matter with patience and care. |
| | Professional training | B. The accountant possesses knowledge and understandability through professional training which qualify her/him as a forensic expert investigating a disputed accounting matter with patience and care. |

Table A1 The questionnaire (continued)

| <i>Characteristics</i> | <i>Enhanced through</i> | <i>Questions/variables</i> |
|--------------------------------|-------------------------|---|
| 3 (Utilising time efficiently) | Accounting literature | A. The accountant possesses knowledge and understandability through accounting literature which qualifies her/him as a forensic expert investigating a disputed accounting matter with efficient utilisation of time. |
| | Professional training | B. The accountant possesses knowledge and understandability through professional training which qualify her/him as a forensic expert investigating a disputed accounting matter with efficient utilisation of time. |
| 4 (Minimum paid cost) | Accounting literature | A. The accountant possesses knowledge and understandability through accounting literature which qualifies her/him as a forensic expert investigating a disputed accounting matter with a minimum paid cost. |
| | Professional training | B. The accountant possesses knowledge and understandability through professional training which qualify her/him as a forensic expert investigating a disputed accounting matter with a minimum paid cost. |
| 5 (Neutrality/impartiality) | Accounting literature | A. The accountant possesses knowledge and understandability through accounting literature which qualifies her/him as a forensic expert investigating a disputed accounting matter with neutrality/impartiality |
| | Professional training | B. The accountant possesses knowledge and understandability through professional training which qualify her/him as a forensic expert investigating a disputed accounting matter with neutrality/impartiality. |
| 6 (Independence) | Accounting literature | A. The accountant possesses knowledge and understandability through accounting literature which qualifies her/him as a forensic expert investigating a disputed accounting matter with independence. |
| | Professional training | B. The accountant possesses knowledge and understandability through professional training which qualify her/him as a forensic expert investigating a disputed accounting matter with independence. |
| 7 (Faithful representation) | Accounting literature | A. The accountant possesses knowledge and understandability through accounting literature which qualifies her/him as a forensic expert investigating a disputed accounting matter with faithful representation. |
| | Professional training | B. The accountant possesses knowledge and understandability through professional training which qualify her/him as a forensic expert investigating a disputed accounting matter with faithful representation. |

Table A1 The questionnaire (continued)

| <i>Characteristics</i> | <i>Enhanced through</i> | <i>Questions/variables</i> |
|---|-------------------------|---|
| 8 (Objectivity) | Accounting literature | A. The accountant possesses knowledge and understandability through accounting literature which qualifies her/him as a forensic expert investigating a disputed accounting matter with objectivity. |
| | Professional training | B. The accountant possesses knowledge and understandability through professional training which qualify her/him as a forensic expert investigating a disputed accounting matter with objectivity. |
| 9 (Materiality thinking) | Accounting literature | A. The accountant possesses knowledge and understandability through accounting literature which qualifies her/him as a forensic expert investigating a disputed accounting matter with materiality consideration. |
| | Professional training | B. The accountant possesses knowledge and understandability through professional training which qualify her/him as a forensic expert investigating a disputed accounting matter with materiality consideration. |
| 10 (Adequate communication and dialogue) | Accounting literature | A. The accountant possesses knowledge and understandability through accounting literature which qualifies her/him as a forensic expert investigating a disputed accounting matter through adequate communication and dialogue. |
| 10 (Adequate communication and dialogue) | Professional training | B. The accountant possesses knowledge and understandability through professional training which qualify her/him as a forensic expert investigating a disputed accounting matter with through adequate communication and dialogue. |
| 11 (Awareness about conflict of interest) | Accounting literature | A. The accountant possesses knowledge and understandability through accounting literature which qualifies her/him as a forensic expert investigating a disputed accounting matter with awareness about conflict of interest. |
| | Professional training | B. The accountant possesses knowledge and understandability through professional training which qualify her/him as a forensic expert investigating a disputed accounting with awareness about the conflict of interest. |
| 12 (Semantic interpretation) | Accounting literature | A. The accountant possesses knowledge and understandability through accounting literature which qualifies her/him as a forensic expert investigating a disputed accounting matter with semantic interpretation. |
| | Professional training | B. The accountant possesses knowledge and understandability through professional training which qualify her/him as a forensic expert investigating a disputed accounting with semantic interpretation |

Table A1 The questionnaire (continued)

| <i>Characteristics</i> | <i>Enhanced through</i> | <i>Questions/variables</i> |
|---|-------------------------|---|
| 13 (Logical sequence and connectivity) | Accounting literature | A. The accountant possesses knowledge and understandability through accounting literature which qualifies her/him as a forensic expert investigating a disputed accounting matter with a logical sequence and connectivity ability. |
| | Professional training | B. The accountant possesses knowledge and understandability through professional training which qualify her/him as a forensic expert investigating a disputed accounting with a logical sequence and connectivity ability. |
| 14 (Cognitive awareness) | Accounting literature | A. The accountant possesses knowledge and understandability through accounting literature which qualifies her/him as a forensic expert investigating a disputed accounting matter with cognitive awareness. |
| | Professional training | B. The accountant possesses knowledge and understandability through professional training which qualify her/him as a forensic expert investigating a disputed accounting with cognitive awareness. |
| 15 (Systems approach) | Accounting literature | A. The accountant possesses knowledge and understandability through accounting literature which qualifies her/him as a forensic expert investigating a disputed accounting matter in a systems approach. |
| | Professional training | B. The accountant possesses knowledge and understandability through professional training which qualify her/him as a forensic expert investigating in a systems approach. |
| 16 (Complementary and interrelated functions) | Accounting literature | A. The accountant possesses knowledge and understandability through accounting literature which qualifies her/him as a forensic expert investigating a disputed accounting matter as a product of an organisation (i.e., a business entity) consisting of many complementary and integrated functions (i.e., accounting, finance, production, human resource, storage, marketing, etc.) |
| | Professional training | B. The accountant possesses knowledge and understandability through professional training which qualify her/him as a forensic expert investigating a disputed accounting matter as a product of an organisation (i.e., a business entity) consisting of many of complementary and integrated functions (i.e., accounting, finance, production, human resource, storage, marketing, etc.). |
| 17 (Exact identification/determination of constituents) | Accounting literature | A. The accountant possesses knowledge and understandability through accounting literature which qualifies her/him as a forensic expert investigating a disputed accounting matter with an exact identification/determination of its constituents/components). |

Table A1 The questionnaire (continued)

| <i>Characteristics</i> | <i>Enhanced through</i> | <i>Questions/variables</i> |
|---|-------------------------|---|
| 17 (Exact identification/determination of constituents) | Professional training | B. The accountant possesses knowledge and understandability through professional training which qualify her/him as a forensic expert investigating a disputed accounting matter with an exact identification/determination of its constituents/components). |
| 18 (Continuous self-education) | Accounting literature | A. The accountant possesses knowledge and understandability through accounting literature to believe in a knowledge self-acquisition related particularly to contemporary developments in various fields relevant to accounting (e.g., law, economics, politics, marketing, production, organisation, etc.) thus qualifying her/him as a forensic expert when investigating a disputed accounting matter. |
| | Professional training | B. The accountant possesses knowledge and understandability through professional training to believe in a knowledge self-acquisition related particularly to contemporary developments in various fields relevant to accounting (such as law, economics, politics, marketing, production, organisation, etc.) thus qualifying her/him as a forensic expert when investigating a disputed accounting matter. |