CHAPTER FIVE

FINDINGS & DISCUSSION

5.0. Introduction

The main task of this chapter is to discuss, interpret and evaluate the findings presented in data analysis to arrive at comprehensive conclusions. Such findings were based on the research questions presented in the introductory chapter, reformulated in the research methodology and analysed in the data analysis. The study basically aimed to analyse the TSs and TPs in order to explore the students' behaviours in translation process and product. In applying translation strategy analysis, the students' weakness and strengths were revealed in strategic competence, cultural competence and instrumental competence. Besides, it attempted to explore the correlation between TSs (independent variable) and the TPs (dependent variable), assuming that good input is associated with good output.

The first research question was concerned with the postgraduate students' use of TSs and TPs in translating culture-based texts from English into Arabic. TSs are the mental strategies that are used to comprehend and analyse a ST (process strategies) while TPs are the linguistic shifts made by the students to render a ST into a TT. As for process strategy (i.e. TSs), it was answered empirically through Translog data, (i.e. task time, keylogging and translation unit) and questionnaire at textual and lexical level analysis. The product strategy (i.e. TPs) were revealed through the students' translations of the five culture-based texts at both textual and lexical levels.

5.1. Translation Strategies at Textual Level

This section is devoted to answering the first part of the research question at textual level, which was answered via the Translog data, namely task time and
keylogging data. Besides, the students yes-no responses to the strategies they used in translating the five texts showed explicitly the TSs they used in translation process. The time data spent on translating the five texts revealed three stages of translation process, namely skimming time, drafting time and post-editing time. It was found that the students' efforts were concentrated in drafting process, with undue attention to the process of skimming and near negligence of post-editing.

The task time data revealed three stages of translation in the students' translations, with considerable differences of time distribution among such stages, namely reading, drafting and post-editing. Such stages of translation were found in Carl, Dragsted and Jakobsen (2011) and Carl and Buch-Kromann (2010). Such studies compared between professional and student translator in terms of time parametre. They found that the student translators did not concentrate on post-editing and their efforts were concentrated in drafting time while the professional translator did the opposite. In this study, it was found the students' effort concentration in drafting, insufficient account of reading process and near negligence of post-editing, which had negative effects on the quality of translation.

Seleskovitch and Lederer’s ‘Interpretive Model’ (2003 cited in Munday, 2008) found three main overlapping phases of translation: 'reading and understanding', 'deverbalisation' and 're-expression'. In such a classification, it is clear that post-editing was ignored which has an important role in shaping translation product. The proponents of this model believed that the cognitive processing of the interpreter transfers through sense and not words, which takes place in deverbalisation process. Munday (2008) criticised such a model due to the difficulty of observing the deverbalisation process.
As for keylogging data, it provided succinct data of the translation process. Translog recorded four types of keylogging data at contextual level, namely total user events, text production, text elimination and miscellaneous events. The software recorded all the keystrokes of each type of operation, namely text production (i.e. actual translation), text elimination (i.e. students translate and edit and the same time) and miscellaneous events (editing and searching for online assistance via online dictionaries and websites). In recording such types of keystrokes, the strategies employed by the students in translation process were revealed. Applying descriptive statistics to such keylogging data namely the mean and standard deviation enabled the researcher to compare between the mean keylogging data and evaluate the data properly.

In translating the five texts, it was found high level of using text elimination and miscellaneous events. One may say that post-editing was very short while the text elimination keystrokes was high in number. The answer was that text elimination exhibited the online revision (the students translated and edited at the same time) while post-editing (i.e. end revision) displayed the final process of translation (the students edited the text after they had completed the drafting process). Such findings agreed with Carl et al. (2011) and Carl and Buch-Kromann (2010) who found that professional translators’ translations tended to be characterized by head starting (i.e. they start translating without reading a text) and post-editing while student translators frequently perform systematic skimming and online revision (students revise the text during the drafting phase). The present study is different from the aforementioned studies’ findings in terms of evaluating the reading process. The students’ reading process was short in this study while it was long in the previous studies, which may be ascribed to the level of translation skills of the targeted population. Such studies
judged the reading process in terms of speed while reading process was evaluated in this study in terms of function, namely text analysis. Starting actual translation without sufficient reading resulted in comprehension and production problems.

As for the miscellaneous keystrokes, they demonstrated the students' dependence on online assistance via online monolingual dictionaries, bilingual dictionaries and search engines. In other words, such findings demonstrated that the students relied on external translation strategies. They could not rely on the internal translation strategies such as memory and context to solve the translation problems. In spite of the students' heavy dependence on external strategies, most of their translations were not acceptable. Yanmei and Mingemei (2014) investigated the differences of strategy pattern in Chines-English translation with different expertise: novice, advanced student translator and professional translator. They found that the novice translators turned mostly to the external tools (i.e. online dictionaries) for help while the professional translator relied on internal knowledge to solve translation problems. Qassem (2014) and Qassem and Vijayasarathi (2015) found that the students relied heavily on dictionaries in translating idiomatic expressions and political culture from English into Arabic, though they could not make a good use of them to translate the SL items into TL appropriately. Bahumaid (2010) found that the students relied heavily on dictionaries to solve translation problems, though they could not use them properly due to the low level of translation competence and procedural knowledge (i.e. know how). As I see it, during translation process, the translator should use external strategies, namely dictionaries and search engines in the light of context and other analytical operations; otherwise their translations would be deviant.
As it was stated earlier, the questionnaire data on the students' use of TSs aimed to supplement the Translog software data. The students provided yes-no responses to the strategies they used in translating each item in the translation task (See Appendix, 2). In doing so, the students' responses to the questionnaire explicitly revealed the strategies they employed to translate the five texts from English into Arabic (See Appendix1). It was found that limited number of the students used internal comprehension strategies (i.e. problem identification, search memory and context) and editing strategies (i.e. re-read and revise). Besides, it was found that high percentage of the students relied heavily on external translation strategies (i.e. online monolingual and bilingual dictionaries and search engines) and guessing in translating the five texts from English into Arabic (See Chapter 4). The least frequently used translation strategies were re-reading, revision, text contextualization and problem identification. Atari (2005) found that the student translators rarely used text contextualization, inference and reasoning in translating from English into Arabic. Deeb (2005) found that the students' errors in the process of translation were ascribed to students' incorrect use of problem identification, mental search for solution, physical search for solution, drafting and editing. Examining the aforementioned findings revealed that the students' use of the TSs were not based on analysis of the texts, which reflected the students' deficiencies in strategic competence.

Lorscher's (1991) and Krings' (1986) classifications of TSs matched the present study's classification in some way. The study classification agreed with Lorscher's in terms of the strategies of realizing translation problem, search for a possible preliminary solution to a translation problem, and Krings in terms of strategies of comprehension (inferencing and use of reference works). Krings added strategies of equivalent retrieval, strategies of equivalent monitoring, strategies of
decision-making and strategies of reduction. Krings' classification included translation process and product as well as mental strategies and linguistic solutions, which is different in some way from process-oriented translation research that lays stress on distinction between translation process and product.

Wills (1996) cited six types of TSs: identification of problems, clarification (description) of problems, search and retrieval of relevant information, problem-solving strategies, choice of solution and evaluation of solution. His classification was linear in a sense that it started with identifying a problem and ended with evaluating the translation problem solution. As I see it, the process of translation is more complex and it does not run in such a linear direction. It is a cyclic process. If the students go from the start to the end and do not find the solution, they may repeat the process of looking for a translation problem solution.

To measure the percentages of the students' use of TSs, the researcher analysed the students' responses statistically via multiple response operation. Such operation tabulated the students' multiple responses, namely yes-response at value (1) to measure the percentages of those who used a certain TS (See Chapter Three).

As it was stated earlier, such TSs could be categorized into more concise comprehensive categorization. They can be classified into internal comprehension strategies (i.e. problem identification, search memory, guess and context), external strategies (i.e. bilingual dictionary, monolingual dictionary and search engines) and editing strategies (i.e. re-reading and revising). Based on the analysis of such TSs in Chapter Four, it was found that the students relied heavily on guess in translation of the five texts, which reflected that most of the students were not sure of the acceptability of their translation. As for internal comprehension strategies, namely problem identification, search memory and context, the percentages of students' use
of such strategies ranged between 7.6% and 47.5%, which indicated that most students could not deduce the meaning of such cultural loaded words, depending on their own translation knowledge and skills.

The students relied heavily on external TSs, namely search engines, bilingual dictionaries and monolingual dictionaries in solving the comprehension and production problems. The students might use search engines when dictionaries were not sufficient. In other words, the students might check encyclopedia and any other articles related to the texts they were translating when the dictionaries' definitions were not sufficient. The bilingual dictionaries were used to solve the comprehension and production problems while monolingual dictionary was used mostly to solve the comprehension problem. Search engines and online dictionaries were the most frequently used strategies to solve the translation problems. Note that 'search engines' and 'online dictionaries' have potentials that could help students to solve comprehension problems (even some production problems), but the students did not use them properly. The least frequently used strategies were editing strategies, namely re-read and revise, which demonstrated the students' negligence of the process of post-editing. Revision is an integral part of the translation process and has an important function in shaping the final target text, though the students did not give post-revision its value in translation process. For Beeby, et al. (2009), revision is a part of procedural knowledge to guarantee the efficiency of translation process and solve problem encountered. Ignoring revision in translation process had negative effects on translation product, which was revealed in product strategy analysis.

The raising question is: Did the students make a good use of such strategies to solve the translation problem? The answer of such a question was the concern of translation product analysis.
5.2. Translation Strategies at Lexical Level

This section is also devoted to answering the first part of the first research question regarding the TSs used in translating culture-based texts at lexical level. The Translog software recorded the activities that students performed when translating a certain cultural loaded word or expression from English into Arabic, namely translation time, text production, deletion, mouse clicks and translation unit. The statistical operation used to measure such activities was the mean, which showed the center of data of such activities for all students so as to compare between them adequately. The mean translation time in translating all the cultural words showed the students' delay in the translation process, which demonstrated the cognitive difficulty that the students faced in translating cultural loaded words. Translation time was measured via counting pauses before starting translation, during and after translation drafting.

In cognitive psychology, long pauses reflect effortful processes compared to processes of short pauses (Rydning, 2002). Jakobsen (1998) argues that a pause length of second is enough for observation of delay. Rydning considers (5) seconds a symbol of cognitive processing, which was followed in this study. Looking into the mean translation time, one could find that the process of translation was delayed. Such finding supported the results of translation time at textual level since it located the expressions that hindered the students in the translation process.

As for text production (alphabetical characters and punctuation marks) at lexical level, it revealed the students' addition of keystrokes in the TL expressions. This finding was obtained from comparing the SL word characters with the TL word production keystrokes, which demonstrated that the students opted for explaining SL words and expressions for the Arab readers. The students might opt for addition since
the English cultural words do not have equivalents into Arabic or the students did not grasp the meaning of such words. Sager (1983), Deeb (2005), Qassem (2014) and Qassem and Vijayasarathi (2015) found that addition is one of the most frequent translation errors. If addition is used without text analysis, it may distort the SL meaning and result in unwanted redundancy. However, addition is the right option in case of absence of equivalence among languages, particularly cultural loaded words that are of implicit cultural background, which will be detailed later in translation product analysis.

As for text elimination (i.e. online revision), it revealed that the students corrected their translation in the drafting process. In other words, the students translated and corrected the English expressions at the same time. Such corrections might be attributed to hesitation, rephrasing and correcting false starts. The students did many online editing (translated and edited at the same time). Many studies reported students' excessive use of online revision such as Carl and Buch-Kromann. (2010) Carl, et al. (2011), Jensen (2001), which was interpreted as attentional shifts such as spelling difficulty, uncertainty, different wording come to the translators' mind. As I see it, excessive use of online revision reflected that the students' revision were not systematic, just limited to smaller context at word level, which made revision unable to make noticeable positive changes in translation product.

Looking into the mean mouse clicks, it was found excessive use of mouse clicks, which demonstrated that either the students looked for online assistance or made editions, using copy, paste, cut, etc. Buchweitz and Alves (2006) found that students clicked mouse many times to go outside the Translog user screen to go online looking for online assistance. Looking into the mean mouse activity at lexical level, it was found that all the English cultural loaded expressions received frequent mouse
clicks to search for online assistance, which reflected the effortful cognitive activity that students had in the process of translating such expressions. Huang, et al. (2012) studied correlation between mouse activity and search engines, finding a positive correlation between them. The frequent use of mouse clicks supported the previous finding that stated that the students relied heavily on external strategies (i.e. search engines and online dictionaries) to solve translation problems.

As it stated earlier, translation unit is defined as a pause of (1) second or more without keyboard activity, but in this study (5) second pause was an indication of cognitive difficulty, to ensure that the pause-defined segment is not merely a result of motor processes (i.e. typing ability) in the case of writing. It is defined as a span of time in which (a) keystroke(s) occur without a pause (Jakobsen, 2011). Translation units showed the translation time and fragmentation of translation product, which demonstrated whether the students translate at textual, sentence or word level (See Literature review). Looking into the mean translation units of translating (27) cultural expressions revealed high degree of the mean translation unit of all such (27) expressions, which ranged from 3 to 7. When the mean translation units are high, it revealed students' division of every linguistic unit (every SL expression is considered as one linguistic unit) into several attentional unit. The translation unit here was considered the unit of attention, which demonstrated that the students' attention was directed toward smaller segments, less than word level. Sharmin, et al. (2008) argued that novice students struggle with ST comprehension. All attention is absorbed by reading and understanding the ST and so the TT production is delayed. Jakobsen (2005) found that text production tends to be clearly segmented into units reflecting the chunks of meaning that were processed. The high mean unit of translation showed cognitive effort in the process of production, which might be ascribed to unknown
terminology, wording and complicated comprehension problems. It might also be due to the poor reading and production skills. Studying translation units are crucial since they reveal the way text is produced into the TL. The length of segmentation as reflected by the mean translation units was high in translating the 27 SL expression form English into Arabic. Jakobsen (2011) argued that translation unit suggest a process which alternated between the ST reading and comprehension, mental formulation translation and physical typing of translation. Accordingly, the high number of translation unit revealed the students' cognitive problems in three areas found by Jakobsen (2011), namely source text reading and comprehension, mental formulation of translation and physical typing of translation. Long pauses indicated the students could not feed their short term memory and process the information concurrently with their typing of the translation (ibid).

Dragsted (2006) argued that translation unit is governed by the limited capacity of working memory. Difficulties in the text can be expected to have various types of impact on the size and nature of translation unit and the speed of production. Campbell (1999) argued that difficult items in the ST place a great demand on the limited capacity of the working memory. When a large amount of the total working memory capacity is used to comprehend or produce a particular item, it must be assumed that less, or no, capacity is left to concentrate on other elements. Accordingly, the presence of a problematic lexical item in the source text will reduce the number of items in a translation unit, possibly to only one word, which result in disfluent translation (ibid).

Dragsted (2006) found two modes that characterised the segmentation of student and professorial translators: analytic mode and integrated mode. The analytic mode is evident in students' translation, which is characterized by short average
segment size, low production speed and long pauses, processing at word/phrase level, many single-word segments, and few exceptionally long segments. The integrated mode was evident in professional translators' translations, which is characterised by long average segment size, high production speed and short pauses, processing at clause/sentence level, few single-word segments, and many exceptionally long segments.

In sum, measuring translation unit could be instrumental in determining what constitutes fluent translation and when reading and production difficulties occur. Accordingly, cultural loaded words constituted a major difficulty for the students in the process of comprehension and production.

5.3. Translation Procedures (Translation product)

This section is devoted to the second part of the first research question regarding translation product, i.e. TPs, which are defined as the linguistic shift introduced by translators in changing ST items into TT items (Vinay & Darbelnet, 1995). They represented the final target text, which can be determined from students' translations. Scholars prefer to call them product strategy procedures or techniques to distinguish them from strategies. Scholars classified TPs according to their background knowledge and the school they belong to. The focus of this study was based on what works with culture-based texts. As it was stated earlier, Olk's (2013) classification of cultural reference TPs was followed since it was practical and was primarily designed to classify procedures of translating cultural loaded words. Olk(2013) classified TPs into 'transference', 'transference+ explicitation', 'transference+ explanation', 'TL expression rooted in SL', 'neutral explanation' and 'cultural substitution'. Examining such classification showed that the classification takes a linear direction, starting with exoticism (i.e. retaining all the SL features as
they are in the TL) and ends with cultural transplantation (replacing a SL expression with its TL equivalence in a TL).

The students' translations of the five texts refuted the assumption that a certain procedure is the highly recommended and the other should be avoided. To be specific, there are certain factors that determine the selection of this or that procedure. It is the nature of the text on the one hand and the TL readership knowledge of the source culture on the other that determine the selection of a certain TP. Many theoretical studies on translation emphasised excessively the role of equivalence in solving translation problems, which was not logical.

According to the data of the study, it was found that transference was the most frequently used procedure, which demonstrated that the students relied on translating the surface meaning of the word; hence resulting in deviation from the SL meaning. This finding matched Olk's (2013) and Rababah's (2008) findings. Olk (2013) found that the student translators relied on transference more than professional translators. Rababah (2008) ascribed the students' dependence on transference to the students' limited vocabulary and exposure to the TL.

Based on examining the students' use of translation procedures in the five texts, it was found that it was the text that determined the use of this or that procedure. The nature of the task as well as the cultural reference and their context strongly favoured a certain TP. Such finding denoted that the translators should consider the principles and factors in choosing the right translation procedures. The traditional concept of classification of TPS, which favour cultural correspondence and equivalence do not work with empirical studies and the practice of translation profession due to the lack of equivalence and similarities among languages. It is Mailhac (1996), who determined the parameters of determining the right TPs. He
drew on translations theorists' factors of translating culture such as Newmark (1988) and Ivir (1987), namely purpose of the text, role of cultural reference, pragmatic coherence (i.e. sort of communicative situation) and readership's knowledge of the source culture. Such parameters should be manipulated practically rather than theoretically in translation training course.

According the data of the study, it was found that 'transference + explanation' was the successful procedure in the case of absence of equivalence and implicit SL expressions. To be specific, if the SL expressions are not lexicalized into TL culture and is new to TL readership, the explanation procedure will be the right solution with consideration to the issue of redundancy. Mailhac (1996) argued that the less informed the reader, the greater the amount of information required to be added by translators. In this vein, Cintas and Remael (2007) argued that addition occurs when the item causes comprehension problem. Consequently, analysis of the text enables the translator to take the right decision regarding translation procedure selection.

Based on evaluation of the students' translations, most students used TPs randomly, which resulted either in distorting the SL meaning or creating ambiguous translation, which reflected the students' problems in the process of comprehension. Qassem and Vijayasarathi (2015) found that the students' inability to translate cultural idiomatic expression was due to the students' insufficient knowledge of English idiomatic expressions and lack of training in the use of translation strategies and techniques. Bahumaid (2010) ascribed the students' low level of translation to inadequate knowledge of English culture and inappropriate use of dictionaries.

The students used 'transference + explicitation' in translating most of the texts, which was not adequate in translating implicit cultural words and expressions since such expressions need to be explained to the Arabic readers to bridge the cultural gap.
between English and Arabic. Here, explanation procedure should not be confused with explicitation procedures. Saldanha (2008) argued that in explicitation procedures ‘the translator’s solution is not to explain the meaning of the item itself but, to provide a minimum amount of information that enables the TL readers to work out the function of the lexical item. Accordingly, explicitation procedure should not be used with terms and concepts that are deeply imbedded in SL culture. However, such explicitation procedure is a way to get rid of unjustified redundancy. In explanation, the translator makes up for the translation loss of important ST features by approximating their effects in a TT (Hervey and Higgins, 1992). The most cases of the students' use of explicitation in the five texts did not arise from the objective needs of the text and context and therefore they resulted in ambiguous meaning. This finding matched Olk (2013) in which he demonstrated that explicitation is not sufficient to clarify the meaning of implicit cultural words for TL readership.

As for 'TL expression rooted in SL', it was found that it was rarely used by the students when translating the five texts, which was due to the lack of existence of Arabic expressions that are rooted in English. It was a successful procedure in cases of nonexistence of equivalence. It ensured the clarity of the words for TL readers and retaining the SL meaning.

The ideal situation for using neutral explanation is in the case of absence of any relation between SL and TL culture. The neutral explanation is based on removing the cultural load of the SL expression to ensure its clarity for TL readers. Olk (2013) calls it 'cultural watershed’ since the lexical culture specificity is largely deleted to ensures easy readability for TL readers. Ghazala (2008) calls it deculturalization. It takes the form of paraphrasing in the TL with no sign for any SL
cultural feature. It was found that neutral explanation was a successful solution in case of wide gap between SL and TL cultures.

As for omission, all the students' cases of using omission resulted in deviation from SL meaning of the SL words and expressions since they deleted central parts of meaning of such SL words and expressions. It was a simplification procedure, but it was used by the students inappropriately. Qassem and Vijayasarathi (2015), Olk (2013) and Deeb (2005) found that omission is one of the causes of errors in translation if it is not based on objective analysis of a text. In some cases, omission can be the right procedure if omitting a certain term or expression does not result in translation loss.

Based on the students' use of cultural substitution in the five texts, it was found that most students used it randomly with no consideration of the SL meaning, context and TL readership knowledge of the source culture. There were some areas where the students used cultural substitution appropriately as in some words and expressions in Text (4) and (5), which demonstrate clearly that it is the text, context and TL readers that are determining factors in selecting this or that procedure; otherwise selecting TPs will result in distorted and ambiguous translation. There is a need here to emphasise that the focus should be shifted from the question of 'what is the right TP that should be chosen?' to 'how should a translator choose this or that TP?'. The question of how he or she should use a certain procedure will assist in determining the areas and factors that need to be considered before deciding on a certain TP.

5.4. Correlation between Translation Process and Product

Most studies were based on the distinction between translation process and product, though the product is a result of the process and so the nature of the product
cannot be understood without a comprehension of the nature of the process (Holmes, 1988). To the best of the researcher’ knowledge, no single study investigated translation strategies as process and product together rather than studying correlation between them. Most studies deal with translation process and product theoretically rather than empirically. Therefore, this section of the research is devoted to investigate the correlation between TSs (translation process) and TPs (translation product).

This section is devoted to empirically answering the second research question regarding the correlation between TSs and TPs. Pearson correlation was applied to measurer the degree of correlation between such TSs and TPs. The previous sections have discussed the findings related to TSs and TPs in translating the five culture-based text per se while this section is devoted to the correlation between them.

The results of such two variables reflected how TSs (independent variables or exploratory variables) had associations with TPs (dependent variables). The students' use of TSs was reflected in the linguistic solutions. It is clear that most students did not anlayse the texts in terms of the main idea and problematic areas that they may encounter and so they could not choose the right TSs that best help render the English culture-based texts into Arabic appropriately. The Pearson correlation was applied to each translation strategy with each translation procedure to see if there is an association between them.

At the level of five texts, it was found there was a correlation of statistical significance at 0.01 between search memory and bilingual dictionary on the one hand and transference on the other. Such correlation demonstrated the association between the students' use of transference (literal translation or transliteration), search memory and bilingual dictionaries. Accordingly, the students' translation of the surface
meaning of the SL words was related to their dependence on their memory and online bilingual dictionaries that mostly offer literal translation. The texts used in the task were cultural and translating their surface meaning resulted either in distorting the SL meaning or ambiguous meaning for TL readership. In most cases, using online bilingual dictionaries in translation results in translating the surface meaning especially with cultural loaded words. Besides, if the students depended on their memories in deducing the meaning of cultural words without prior cultural knowledge, their transactions would be deviant.

The second recurrent correlation in the five texts was between translation strategies, namely (problem identification, context, and search engines) and 'transference+ explanation'. Explanation procedure was crucial in translating cultural loaded words that do not exist in the TL culture. The correlation demonstrated the association between problem identification, context and search engines and the use of 'transference+ explanation'. Such finding reflected that the appropriate use of TSs is expected to result in adequate translation.

The third recurrent correlation was between guess and omission. The students’ use of omission was not justified since central parts of meaning of the expressions were deleted. Such correlation demonstrated a link between the students' use of guess and omission. The students did not use omission according to background knowledge of the expressions and context, but to their guess. Deeb (2005) found that the most cases of omission in students' translation are due to lack of knowledge of English culture.

The fourth recurrent correlation at level of five texts was found between problem identification of and the use of cultural substitution procedure. Such correlation denoted an association between the students' realisation of a translation
problem and the use of cultural equivalence. To be specific, some students realised the English cultural expressions have equivalents in Arabic and so they used equivalence procedure in translating such expressions.

There were also many correlations between some TSs and TPs in some texts and not at the level of the five texts, which were due to different natures of the texts and different translation strategies and procedures employed by the students.

Dragsted (2012) investigated the correlation between translation product and process as indicator difficulty. She found that high target text variability across subjects correlated with high eye fixation counts, long gaze time and long pauses. To be specific, high variability in the TT was associated with more self-corrections, which means that any action in the process will result in change of the product.

The most important issue here is the association between the TSs and TPs. Such correlations are crucial for translation practitioners and translation programme trainers. Chesterman (2005) stated that causality or relation between translation models, viz. process and product will result in comprehensive clear translation programmes that related theory to practice.

5.5 Problematic Areas in Translation Process and Product

This section is devoted to answer the last research question concerning the problematic areas in the students' translation process and product. Based on the analysis of the TSs and TPs employed by the students to comprehend, produce, edit and post-edit the text, many problematic areas were explored. Besides, the students' translations of the five texts of 27 cultural expressions revealed drawbacks in the selection of TPs.
5.5.1. Problematic Areas in Translation Strategies (Process)

Based on the TSs employed by students when translating the five texts, many problematic areas were revealed either through Translog data, namely task time, keylogging, translation unit and mouse clicks or questionnaire, namely internal comprehension strategies, external strategies and editing strategies.

As for the task time, it was revealed that there were three main stages involved in distribution of time in the processing and production of the texts: skimming time, drafting time and post-editing time. These three stages of translation varied considerably in terms of time. The students' efforts were concentrated in drafting time. Insufficient attention was paid to reading process and the process of post-editing is nearly to be neglected. The students did not give reading process its value, which did not mean that the students did not read the texts, but they read and translated the text at the same time. Preliminary reading of the text gives the students an idea of the type of text they are going to translate and the problematic areas they may encounter. Preliminary reading of the whole text provides the students large context that will help them in comprehending the context and detecting the purpose of the text.

The students' efforts were concentrated in drafting time, which delayed the translation production since the students' attention was scattered among reading, actual translation and editing. In drafting time, the students read the ST for comprehension, formulated the meaning mentally, typed and edited the translation, which might influence the translation product negatively.

As for post-editing, it was an important stage in the process of translation, though the students did not consider such a stage, which was manifested in short time spent on the process of post-editing. It is the last process of translation which is an important factor in shaping the final target text.
In case of keylogging, namely miscellaneous events and deletions, excessive use of miscellaneous events and deletions were found. In some texts, they constituted about the third percentage of the text production keystrokes (i.e. drafting process). The excessive use of deletions demonstrated the students' dependence on online revision (the students translated and edited at the same time), which revealed the students' hesitations in translation process. Miscellaneous events demonstrated the students' overuse of online dictionaries and search engines too look for online assistance. They also showed the students' use of editing practices such as copy, paste and cut.

The mouse clicks demonstrated the students' hindrance at lexical level. The students' difficulty in the process of comprehension was reflected in the mouse clicks. Such findings were interrelated with the findings at textual level. The mean mouse clicks were high in translating all the 27 expressions (distributed in the five text), which demonstrated that the students could not infer the meaning of such words depending on their memories and context and so they consulted online dictionaries and search engines.

The mean translation units revealed clearly that the students translated separated words, not meaningful units. The students' translations were disfluent, which reflected that the students translated at word level, which made the process of rendition unable to deliver the meaning of the SL cultural words and expressions to the TL readers.

As for questionnaire, the students stated explicitly the strategy they used in translating each cultural word of the five texts. Depending on the students' responses, the strategies used by them in translating the five texts, namely 27 cultural loaded words were classified into internal comprehension strategies (i.e. problem
identification, search memory, guess and context), external strategies (i.e. monolingual dictionary, bilingual dictionary and search engines) and editing strategies (i.e. re-read and revise). In translating each item, they used multiples strategies, which reflected that the students did not know the right strategy that best help translate the SL words and expressions into Arabic adequately. They just chose translation strategy by trial and error method, which reflected shortcomings in translation skills. Examining the TSs used by the students (as explicitly stated by them) demonstrated the students' reliance on external strategies such as online dictionaries and search engines to solve the translation problem. Using dictionaries and search engines without considering the context and identifying the translation problem result in deviation from the SL meaning. The use of external translation strategies should be used in the light of internal comprehension strategies in order to choose the right decision that solves the translation problem. As for the editing strategies, they were the least frequently used strategies, which supplemented the results of task time data in which post-editing time was very short.

5.5.2. Problematic Areas in Translation Procedures (Product)

It is axiomatic that the students' problems in the process of comprehension will have negative effects on the translation product. The students' selection of the TP was the final decision that is based on the strategies used in translation process. There were many options before the students to take the right procedures: transference (literal translation), explicitation, explanation, neutral explanation, omission, cultural equivalence etc. The selection of a certain TP should be based on identifying the problem inherent in the SL text. The translator should analyse a ST in terms of the purpose of the text, context, role of cultural reference in the ST and the TL readership
knowledge of the SL in order to take the right decision that best renders the SL cultural expression into the TL appropriately.

Based on the students' translation of the five texts, it was revealed that most TPs were not used appropriately in the five texts. Scrutinizing the students' translations revealed lack of consideration for the purpose of the text, context, readership's knowledge of the SL culture and retaining the SL meaning. The meaning of the TTs was either distorted or ambiguous for the TL readership. Mailhac (1996) proposed four parameters for choosing the right translation procedure at textual level and 14 parameters at lexical level (See Chapter Two). Newmark argued that texts should be analysed in terms SL writer, culture and norms on the one hand and TL readership, norms and culture on the other (1988).

Statistically, no correlation was found between the students' score and time, which demonstrated the students' difficulty in translation process and product. No association between scores and the increase or decrease of time which reflected the students' limited knowledge and skills to solve translation problems. The time became an inefficient factor in improving the quality of students' translations due to the students' limited skills and knowledge.

The students' mean test scores were 11.90, while the maximum test score is 27 (each cultural word is given one score), which reflected the students' low scores. The students' scores were concrete evidence for students' poor performance in translating the 27 cultural expressions distributed in the five texts.

Based on the previous analyses, the problematic areas that encountered the students in translation process and product were manifested in disfluent translation, high number of translation units, more effort and time, lack of the SL cultural
knowledge, inability of using TSs and TPs, unacceptable translations and low scores. Such problematic areas were due to the students' deficiencies in strategic competence, cultural competence and instrumental competence.

5.6 Pedagogical Implications

The study's contribution to practice of translation is central as it is to the translation as a theory. The practice of translation should draw on translation theory, as the theory should be examined in the practice. The findings of the study drew on two trends of translation research, namely process-oriented and product-oriented translation, which were examined empirically to see how they can contribute to the teaching situation of translation in term of curriculum development, syllabus design, translation materials and teaching methods.

The study findings were primarily intended to benefit translation teachers, translation course designers, curriculum developers and translation material writers. Analysing translation strategy demonstrated the way the students translated, which revealed their weaknesses to be tackled and strengths to be enforced. The findings of the study revealed shortcomings in the students' competencies, namely strategic competence, instrumental competence, strategic competence and cultural competence. Accordingly, such competencies should be covered interactively in translation training programs theoretically and practically.

5.6.1. Curriculum Development

The students' use of TSs and TPs revealed deficiencies in the students' knowledge and translation skills, namely declarative knowledge (i.e. know what) and procedural knowledge (i.e. know how). Based on the TSs and TPs employed by the students when translating the five texts, the students' deficiencies were revealed, which reflected that the practice was not prioritized by the translation programme
targeted by the study. The students' competencies were not reflected in their use of TS and TPs, which confirmed the previous assumption that the informants' master programme is theory-based. To be specific, the lack of skills, transferability and underestimation of practice was evident in the students' translation process and product.

Due to the emergence and influence of revolution of technology and social driven market forces, the emergence of new curriculum is needed to consider such challenges. Curriculum developers should consider the needs of the students that vary according to stakeholders' needs and rapid technological development. The recent educational systems should follow a more practice-oriented approach when developing curricula, where the focus is on the acquisition of competencies and skills (Calvo, 2011).

Based on the study's findings, the competence-based curriculum should address the following issues:

1. Strategic competence: The present study offered clear, accurate and comprehensive methods for translation strategy analysis. If such analysis is applied at the level of translation class or programme, it will explore the deficiencies in students' strategic competence. Based on the results, translation teachers and course designers should do the remedies and necessary changes that account for the students' deficiencies in strategic competence.

There should be clear criteria for managing the students' translation process and product in translation course practically rather than theoretically. The three stages of translation, namely reading, drafting and post-editing should be given their due consideration in terms of skills needed in theory and practice. The
students should practise managing these three stages of translation. The students should be provided with skills and knowledge required to deal with such stages of translation. TSs and TPs are at the heart of strategic competence since the former strategies solve the comprehension problem and the later strategies solve the production problem. The students should be trained in how to use external translation strategies (i.e. search engines and online dictionaries) in the light of internal comprehension strategies (context, searching memory, re-reading etc.). They should be taught how to select TPs according to the parametres of TP selection. Translation course should cover text analysis theoretically and practically so that students can deal with translation problems inherent in different types of texts. Accordingly, the students can choose the best strategy that solves translation problem and evaluate such a solution.

2. Cultural competence: It is crucial for translation course to cover various types of culture: social culture, political cultural, religious culture, material culture, etc. in the contents of the course. Many translation courses account for such issues and present sufficient cultural content, but they lack a clear methodology. Therefore, translation course should account for a cultural issue in the contents of the course and the methods of teaching.

3. Instrumental competence: The translation curriculum should make a good use of technological development. The curriculum should reflect such technological development in its objectives, contents, methods and evaluation tools. The present study revealed the students' inability of using search engines and online dictionaries in translating culture-based texts. To solve such a problem, online dictionaries and search engines' management, online translation memories, offline
translation memories and encyclopedia should be incorporated in translation training programmes theoretically and practically.

Martinez & Hurtado (2001) argue curriculum should consider the transfer and strategic competencies, which play a vital role: the former, because it brings together all the other sub-competencies, and the latter, because it is used in making up with the deficiencies and solving the problems arising from any of the other sub-competencies.

Curriculum developers should pay attention to curricular contextualization and deliberation before proceeding to the application of competence models. Kelly (2005) emphasizes the importance of analysing the context in which trainers work prior to addressing curriculum design proposals. He set guidelines for curriculum developers to be reflected upon when deciding on a certain translation curriculum; among them are the society’s needs, professional standards, stakeholders’ needs, industry’s needs, institutional policy, disciplinarity and students’ needs.

5.6.2. Multimodality of Translation

The study followed a multimodal translation research, namely psycholinguistic, linguistic and cultural translation research. To be specific, the translation process was analysed through the computational model of Human translation, namely Translog supplemented by the questionnaire. The translation product was analysed through the linguistic model (i.e. comparing SL and TL text). Besides, the selection of culture-based text was based on translation scholars’ classification of culture. In adoption of such multimodality in translation training and research by researchers, teachers of translation, translation course designers, it is possible to cater for the students' needs in different stages of translation in terms of knowledge and skills. Accordingly, it is not justified to separate translation process from translation product in translation training programmes.
Translation courses need to be multidimensional if they are to cater for realistic translational market requirements in tomorrow’s world. Translation training programmes need to be based on real world criteria in a sense that trainee translators need to be prepared for any situation either nationally or internationally by theoretically and practically reflecting such real world criteria in developing translation curriculum. The task of translator education is to provide the students with competencies not mere knowledge on translation. The curriculum developers should take into account the prerequisites of translation profession by following a multimodal approach in translation training program; hence placing students in a position to deal confidently with various types of texts, subjects and situations (Ulrych, 2005) and (Fawcett, 1987).

5.6.3. Computational Model of Human Translation

Computational model of Human Translation is a new perspective of studying translation process. It is distinguished by its accurate and replicable methods and noticeable changes in the field of translation as research and training. In its investigation, it relies on Translog and eye tracking device, which make a major contribution to translation studies, namely process-oriented research either in research or training. As for Translog, it can be used by trainers to analyses student translators’ translation process and product to determine the problematic areas that need special attention. To be specific, it provides an instructor with the task time of students’ translation via skimming time, drafting and post-editing as well as strategies employed by them as reflected in keylogging (i.e. online revision, text production, etc.), mouse clicks (i.e. search for online assistance) and translation unit (fluencies or disfluencies). Such data enable translation teacher to diagnose the areas that constitute difficulties for the students and explore their weaknesses and strengths. It can also be
used by students to evaluate their translation process and product via 'replay section' in the software that record their translations, which enable the students to view their pauses and defects in translation process and product.

As for eye tracking, it is more accurate and valid method to measure the process of translation. It has the capability of recording the students’ eye movement (gazes, fixations and saccades) while translating. It provides accurate data on how the students translate the text, though it is very expensive and that is why the researcher could not use it in this study.

In the Arb world, Translog, eye-tracking and other similar instruments are not used in translation training programmes in universities and school of translation. Besides, no single study in Arabic that used Translog or Eye-tracking in studying translation process.

5.6.4. Translation Strategies and Translation procedures

TSs and TPs are part of procedural knowledge. As it was stated earlier, TSs are the mental strategies that are employed by student translator to solve a translation problem, along the way from identifying the translation problem to solving the translation problem and evaluating the solution. TPs are defined as the linguistic shifts introduced by translators in changing ST items into TT items. Both of TSs and TPs are part of the strategic competence, which is defined by PACTE (2003) as procedural knowledge (i.e. know how) to guarantee the efficiency of the translation process and solve problems encountered. Its function is to plan the process, carry out the translation project (selecting the most appropriate method) and evaluate the process. The importance of strategic competence lies in its relation to the final purpose, activating other competencies, identifying translation problems and compensate for
any deficiencies. Such procedures should be covered in the translation course in theory and practice.

The study reported many problems in the students' selection of TSs and TPs. The main problem lay in the random selection of TSs and TPs, which reflected gaps in translation training programmes. There is no systematic teaching of how to manage translation process and product. TS (i.e. process) and TP (i.e. product) should be presented in translation course practically rather theoretically. Both translation process and product should be covered in translation course together, not as separated entities. In other words, TSs and TPs work together and each influence the other and so they should be integrated in a translation training course.

5.6.5. Model of Translation Strategy Analysis

The analysis of TSs and TPs presented by the study can be used as a model for translation teacher to analyse the students' use of TSs and TPs, which enables him or her to find out deficiencies in students' knowledge and skills. It can also be used at the level of translation programmes in order to design translation courses according the students' objective needs.

5.7. Recommendations

On the basis of the study' findings, the researcher offers many recommendations that should be considered to make objective changes in the teaching situations of translation.

1. The translation programme should be based on the objective study of students' and stakeholders' needs and the changes inside and outside the country in order to qualify the students for the various present and future challenges of translation profession.
2. Translation competence-based programme should replace objective-based programme.

3. Teaching methods should reflect multimodal of teaching methods. It should not be restricted to a certain translation course. Translator training should integrate theory and practice, written and visual teaching materials, a classroom and online study platform as well as teacher's guidance and students' participation.

4. Translation training programmes should make a good use of e-learning management system such as 'Blackboard Learn', which has major potentials due to its tools that are characterized by progress tracking, assignments, student-self-evaluation, navigation tools, course content search, etc.

5. Translation material writers should incorporate various theories of translation such as product-oriented model (i.e. semantic method, dynamic equivalence, cultural model and process-oriented (i.e. psycholinguistic model, interpreting model, computational model) and sociolinguistic model in a meaningful integrated materials capable of building students' competence.

6. Teacher of translation should adopt several models of translation mentioned above in training students to translate various types of texts.

7. Teachers of translation should make a good use of the tools of computational model of human translation in training and evaluation of the students' translation process and product, namely Translog software and Eye-tracking device.

8. Translation course should incorporate methods for practical text analysis that work with different types of text.
9. Teacher of translation should consider the areas of relationship between TSs and TPs and how each influence the other.

10. There should be a clear practical method to train students to use TSs and TPs, considering the parameters of using this or that strategy and procedure.

11. Different phases of translation, namely skimming, drafting and post-editing should be considered in training course by giving them their value in the process of translation.

12. Teachers should be trained to use Translog software and other relevant software in translation teaching and training.

13. Translation curriculum should aim at improving students’ competencies rather than providing them with knowledge of translation.

5.8. Suggestions for Further Research

The study was limited in its scope to translation process and product strategy analysis when translating written culture-based texts and so it could not cover translation process and product per se. It was restricted to written general discourse excluding spoken discourse and highly specialised texts. As for the research tools, the study did not use eye-tracking device since it is very expensive and entails high level training. The study of culture-based texts was restricted to what relates to culture and so could not cover other types of texts and genre. Accordingly, the following areas of research need to be investigated.

1. It would be more accurate if the study is conducted, using eye-tracking device as it shows accurate data concerning eye movements during translation.
2. It is suggested to study TS, following bi-directional study (i.e. Arabic-English and English-Arabic translation) to see whether the same data are obtained or not.

3. It would be useful to investigate TSs with general texts in order to see the similarities between data of culture-based texts and other general texts.

4. Further studies on measuring the correlation between use of TSs or TPs and the students' performance (i.e. scores) are highly valuable to see what matters a lot in students' performance.

5. Conducting experimental studies on translation strategy analysis used by postgraduate students at Saudi Universities for the purpose of diagnosing the weaknesses and strengths of translation programmes at those universities are expected to make noticeable changes in teaching situation of translation programmes.

6. Empirical and theoretical studies on translation strategy analysis in translating a spoken discourse are required in order to see what hinder students in simultaneous and consecutive translation either in the process of comprehension or production into the TL.

7. Further investigations on skimming, drafting and post-editing time when translating culture-based texts are required to see how time distributed into these phases.

8. Finally, it would be a profound investigation if the same study is applied at lexical level, using both Translog and eye tracking device.
5.9 Conclusion

Investigating TSs and TPs is one of the most significant areas of translation research since such investigation accounts for exploring competencies in translation. In this vein, the study explored the students' deficiencies in strategic competence, cultural competence and instrumental competence, using a novel technological tool (i.e. Translog) that allows a researcher to study the translator behavior in different stages of translation. It was found that the students used TSs without doing text analysis and selected TPs without applying the parametres of TP selection. Inability of using TSs and selecting TPs reflected problematic areas in the strategic competence, cultural competence and instrumental competence. Such deficiencies in competencies were ascribed to the theory-based curriculum that is based on pre-defined objectives. The theory-based curriculum imposes certain objectives on a translation programme instead of considering the students' and stakeholders' needs and the changeable requirements of translation profession that vary inside and outside the country.

The process of change should take place in the curriculum development of translation programmes in order to enable such translation programmes to qualify the student translator for the needs and prerequisites of translation profession. The novel technological tools of computational model of translation (i.e. Translog and Eye-tracking) should be used in translation training courses and the tools of assessing the students' progress. Besides, the translation courses should leave the traditional method of teaching languages that focuses on the structure of the language at the expense of the cultural dimension, which enables the students to have profound knowledge of English. The cultural knowledge should not be presented in a form of articles and information; rather there should be clear methodology of how to deal with such
cultural knowledge, along the way from realizing a cultural translation problem to evaluating such cultural translation problem solution.

Finally, the teaching of translation should follow the model of multimodality that focuses on translation process and product, theory and practice, written and visual materials, classroom and online courses in order to qualify the students for the various demands of translation profession and create comprehensive successful training