

Reforming translation education: The power of inquiry-based learning in translators' cognitive development

 Bilal Khalafi¹,  Linda Al-Abbas²,  Ihab Mahmood³,  Taha Shabeeb⁴,  Sajjad Mustafa⁵

¹Department of Translation, College of Arts, University of Anbar, Ramadi, Anbar, Iraq; bilalkh@uoanbar.edu.iq (B.K.).

²Department of English Language and Literature, Middle East University, Jordan; lalabbas@meu.edu.jo (L.A.A.).

^{3,4,5}College of Education for Humanities, University of Anbar, Ramadi, Anbar, Iraq; aehabmajeed@uoanbar.edu.iq (I.M.); ed.taha.shabeeb@uoanbar.edu.iq (T.S.); Sajjad.alani@uoanbar.edu.iq (S.M.).

Abstract: Calls for reform in the field of translation have been sustained since the early days for being an independent field of knowledge. Recently, the importance of involving learners in educational settings has been highlighted as a meaningful strategy for improving cognition and academic expertise. This study designates Inquiry-Based Learning (IBL) as a learner-centered teaching paradigm in which students actively participate in cognitive activities. It aims to evaluate how IBL improves translators' cognitive performance by encouraging better intellectual interaction with texts, situations, and the translation process. A qualitative design was utilized, which included classroom activities and journal entries from undergraduate translators who had been exposed to IBL-driven modules. The data were analyzed thematically to discover cognitive shifts and translators' perspectives. The findings show that IBL improves cognitive awareness, promotes self-determination, and fosters responsive problem-solving abilities that are essential for successful translation. The study concludes that IBL creates a dynamic, reflective translator identity while strengthening cognitive ability. This study encourages educators to incorporate IBL into the translation curriculum to close the gap between classroom instruction and practical translation needs, thereby placing students as active knowledge producers. It also enables policymakers to assess and strengthen translators' education.

Keywords: Academic literacy, Cognition, Competence, Inquiry-based model, Translators.

1. Introduction

Translation is a cognitive process of reformulating a source text in a target language [1]. This process takes place through cognitive stages which reflected the translator's proficiency and skills. Investigations in translation literature reflect a strong connection between the development of translators' skills and cognitive translation process within specific learning models. However, the current work aims to explain the development of academic literacies in translation classes which is not displayed clearly in the previous literature. It shades the light on the inquiry-based model, which considers as a practical model for developing cognitive educational activities. Translation scholars indicated that the features of the inquiry-based model incorporate in developing literacy skills and the cognitive process of translation [2]. Thus, the nature and process of inquiry-based learning should briefly highlight before moving through the process of developing translators' skills.

Constructivists defined inquiry-based learning as an educational process or strategy, where learners behave like professional scientists for constructing new facts in all fields of knowledge, including the social sciences [3]. Siphukhanyo and Olawale [3] found that inquiry-based learning is a process for developing learners' problem-solving skills by educational practice. Others described inquiry-based learning as the process for discovering cause and effects relationship, whereas learners create a

hypothesis for those relationships and carrying out experimental investigations and evaluate the outcomes [4]. Furthermore, some scholars provided further descriptions on the nature and efficiency of inquiry-based learning like, Rodríguez, et al. [5] who studied the development of creative skills through inquiry-based learning. All those descriptions briefly reflected the nature and process of inquiry-based learning.

Inquiry-based learning enables researchers to explore the development of learners' academic literacies such as developing critical thinking, searching for unfamiliar texts or databases and developing knowledge with academic conventions of the related field [6]. Relatively, those conventions supported by the features of the inquiry-based model. The current review based on identifying the triangulated relationship between inquiry-based learning, cognitive translation activity and developing learners' academic literacy. However, the term 'Academic Literacy' seems to be very wide and straightforward. Henderson and Hirst [7] defined the concept of academic literacy "tends to hide any of the diversity that exists, thus restricting us to a singular view of literacy and a particular set of practices" (p. 27). While, Lea [8] added that academic literacy refers to students' participation in learning practice to make use of the present academic context.

The current development in social communication and educational technologies supported the implementation of inquiry-based learning in various fields of knowledge [9]. One of those fields is translation studies which maintained the development of academic literacies by adopting the inquiry-based learning model in translation education. It found that the cognitive process of translation embedded in the inquiry analysis of source expressions through a deep cognitive process which connects current text to the previous stored knowledge in translator's mind [11]. This process reflects explicit connections between discourse variables and the demands for developing translators' literacies. The current review had driven by the following inquiries.

1. To what extent is inquiry-based learning considered an effective model for developing cognitive practices in translation classes?
2. What are the evidences in literature that inquiry-based learning supports educators and literacy advisors?

2. Methodology

The current literature review implements a systematic approach for synthesising the studies which review the development of academic literacies in inquiry-based translation classrooms. Dixon-Woods [12] defined systematic review as "a scientific process governed by a set of explicit and demanding rules oriented towards demonstrating comprehensiveness, immunity from bias, and transparency and accountability of technique and execution" (p.332). It is a process of collecting data out of literature in order to compare and evaluate the efficiency of a particular phenomenon in literature studies to address current issues [13]. The current process of systematic review characterized by specific criteria for narrowing the scope of the review. The criteria of inclusion had set up by the researcher based on readings in relevant works for systematic reviews in social sciences as designed by Moher, et al. [14] in the PRISMA 2009 checklist. Gough [15] described those criteria as standards for judging the weight of evidence in the previous literature. Table 1 explains those criteria of inclusion in detail as follow.

Table 1.
Literature inclusion criteria.

No.	Criteria	Description
1.	Topic	The literature related directly to inquiry-based learning, academic literacy and translation studies.
2.	Period	Studies published between 2010 and 2019.
3.	Data Bases	The studies collected from six data bases (JESTOR, Scopus, Springer Link, SAGE, Taylor & Francis, Academic Search Premier).
4.	Research Method	Literature includes only empirical studies of both quantitative and qualitative in the field of translation studies.
5.	Transparency	The method of research in previous studies must be explicit in terms of sample size, instrument and analysis.
6.	Reliability \ Validity	The outcomes of the studies must be valid and reliable according to the type and publication indexing.

The first stage in the current review was setting up inclusion criteria as shown in Table 1 to confirm that the literature systematically reviewed. Whereas, studies that do not match those criteria excluded from the review. The second stage was searching for related studies in databases by the relevant keywords, independent and dependent variables that embody the topic of the current review. The review found 234 studies in the target databases that employed 1,237 participants related to the context of the study. The third stage was reviewing the titles, abstracts and conclusions of the relevant studies for evaluating the search outcomes. Alos, it determined a total number of 117 relevant works, including meta-analyses and projects in the literature. The last stage was more profound investigation for the relevant works by looking after samples size, methodology and outcomes in those works. The total number of studies implemented in this review was thirty-six studies based on the inclusion criteria. An analysis of relevant works carried out to build the critical plot of the current review. It identified a prominent role for inquiry learning method during the previous application in translation classes. Lastly, the conclusion is drawn based on the current review for answering the research questions.

3. Nature and Objectives of Inquiry-Based Learning

The literature of inquiry-based learning often leads to the works of the philosopher and educator Johns [16] who had influenced considerable changes from the traditional-based model to inquiry-based learning during the 20th century. Dewey [17] believes that the traditional-based learning of merely memorising facts does not achieve the required goal of the learning process, but it consumes experts rather than building learners' cognitive thinking scientifically. Inquiry-based learning developed in the educational field by constructivists in the early 1960s. Kuhlthau [18] defined inquiry-based learning as "An instructional model which enables students to get a depth of understanding and a personal perspective through a wide range of sources of information" (p. 20). The gradual development in the application of inquiry learning and further evaluations carried out subsequently for better learning practice in the inquiry-based classrooms [2].

The process of inquiry-based learning focused on learners as it prompts learners' centre method. However, motivating learners' cognitions toward inquiry and asking questions considers as the first step in this process, whereas learners generate some questions for investigating specific issue or topic. Those questions are driven by a set of open-ended questions to build the answers out of the practical context [19-21]. Practically speaking, the process of inquiry involves posing some open-ended questions related to investigating certain reality. Those questions follow a systematic method of investigation, analysing, managing the outcomes of this investigation and evaluating the results. This process of data mining and management offer an opportunity for leaners to develop academic literacy skills and increase their self-confidence in the outcomes of this educational process [22].

Concerning the context of current work, Kumar [23] highlighted the benefits of implementing inquiry-based learning like fostering academic literacy by developing learners' abilities to locate, assess and use present knowledge and link it to previous one. Additionally, participation in inquiry-based

learning activity increases the opportunity to develop three learning objectives [24]. Firstly, it develops learners' critical thinking skills. Second, it improves learners' investigation skills. Lastly, it enhances learners' understanding of knowledge and learning principles. Moreover, the process of knowledge acquisition in inquiry-based classrooms contributes in generating meaningful context of learning based on self-investigation practise. The contributions of inquiry-based learning in developing learning content are summarising as follow.

1. Problematisation: The nature of inquiry-based learning can lead the learners to understand the limits or boundaries of their knowledge during the inquiry process in a specific problem or task. Admitting those limits by learners arouse their curiosities on such a problematic context of knowledge and motivated them for learning toward a more in-depth cognitive investigation [25].
2. Supplication: The process of acquiring successful outcomes for the learning model requires the accomplishment of systematic investigation. This investigation process has to follow clear steps which describe the process of investigation and how the outcomes had been generated [26].
3. Innovation and evaluation: The nature of inquiry-based learning enables learners to investigate the learning context to generate answers for the addressed questions or inquiries. Thus, the stages of acquiring outcomes follow a sub-sequence process of evaluation and refinement for the outcomes before building the conclusion on absolute reality [27].
4. Application: Inquiry-based learning enables learners to apply and amend their understanding of a specific field of knowledge. This process of practical reorganization of knowledge and supporting justifications assist learners' future educational practice. Moreover, it supports the newly acquired knowledge and enriched its relation to other contexts [28].

Alternatively, Kirschner, et al. [29] argued the nature of inquiry-based learning for being an effective method of leaning. They related their argument to the ignorance of the inquiry process for the limits of learners' working memory, specifically their short-term memory, which indicated by Simon and Ericson (1985). However, Hmelo-Silver, et al. [30] indicated that the current nature of inquiry has practical and powerful effects on learner's cognition during the learning process. Their argument based on the necessity for more guidance by educators during the inquiry process, which enables participants to overcome this limitation. Many other studies dedicated to explore this necessity. Kaçar, et al. [31] conducted a meta-analysis study for collecting the broad studies which used varied terms to describe inquiry-based learning (e.g., constructive learning, student focus learning). The study supported the application of inquiry-based learning more than other instructional models.

Moreover, Another review carried out by Gijlers and de Jong [27] showed the benefits of teacher guidance in developing inquiry-based context and facilitate the limitations of short-term memory in developing learners' cognition. Faria and Miranda [32] conducted meta-analysis research which confirmed the usability of teacher guidance in supporting inquiry-based learning to overcome the limitations of working memory. In conclusion, the investigations in the literature of inquiry-based learning and its objectives showed the usability of this model to develop progressive knowledge acquisition process as shown in the previous literature and the studies presented by Alfieri, et al. [33], García and Veiga [34], Camps [35] and Assuah [4].

4. Inquiry Approach and Academic Literacy

Daminova, et al. [24] defined literacy as "acquiring knowledge of a particular subject, or a particular type of knowledge" (p.69). The definition reflects the functional reference of the general term of literacy which is related to the process of new knowledge acquisition. In terms of academic skills, academic literacy refers for a broader space of learning skills in the academic context such as critical thinking, reading, writing, speaking and listening [36]. The individual abilities to deal with those skills within the educational context reflect learner's abilities in mastering academic literacy. Further understanding of this term can be acquired by looking for smaller segments of the academic discourse which must be acquired by learners to become academically literate. The requirements for developing

academic literacies within the educational context of inquiry-based learning discussed in the following five points.

4.1. Institutional Support

Institutions must acknowledge the vital role and contributions provided by literacy specialists [37]. Those contributions considered as the key component for developing the educational context in various fields of knowledge. The development of academic literacy based on the systematic process of continuous evaluation and identification for the drawbacks in learning approaches. Literacy specialists are considered as supervisors for models' assessment processes. However, institutions understanding for the interconnected relationship between the development in learning models and academic literacy within the practical context of learning cannot be guaranteed in various learning models. Practical evidence for the defect in understanding the relationship between developing models and academic literacies reported in New Zealand.

Bean and Goatley [38] mentioned that some of the higher education institutions were supportive for the role of the literacy specialists, while others were unconscious and did not have any awareness for the role of the assessor in developing learning models. He stated "Most found their immediate line managers sympathetic, but an unfortunate few answered to administrative staff who had no understanding of the challenges of teaching" [39]. The reasons for this unawareness related directly to the conceptualization of learning models. Therefore, educational institutions require to invest in implementing modern models for better processing and assessment in the educational context. However, the literature showed that varied learning models developed for improving learners' academic literacies as the focus of the educational institutions. But, inquiry-based learning seems to be the main model which supported institutional role to focus on the drawbacks of low academic literacies during process of learning and assessment.

4.2. Collaborative Learning

There is a vast number of the studies in the literature which supported the nature of inquiry-based learning as a collaborative approach for developing learners' academic literacies (see, [3, 16, 40]). Chu, et al. [2] is one of the scholars who suggested that collaborative nature of inquiry between educators and literacy specialists support fostering learners' beliefs on the development of knowledge acquisition during all the stages of their learning activity. Similarly, this development related to all the stages of the cognitive process of translation. Furthermore, collaborative inquiry-based learning aims to support translators' confidence in the newly acquired knowledge [22]. Moreover, learning through inquiry bridges the gap between various learners' abilities within the same activity of learning.

4.3. Educators' Guidance

Several studies in the literature indicated the importance of guidance in the learning process. The main difference between inquiry-based learning and other instructional models is the educators' guidance within a learning context [41, 42]. Studies showed some positive and negative impacts for limited guidance of inquiry-based learning [44]. Traditional learning emphasised that guidance developed students focus during the knowledge acquisition process, which enabled them to acquire better understanding during the learning process. While, inquiry-based learners had better understand for the limits of their abilities and higher assurance in their tasks which considered as the main objective for the educational process [45].

However, some investigations showed that some complementary frameworks and modifications enable inquiry-based learners to overcome limitations of short-term memory such as "bottom-up" approach "one size fits all" approach [46]. The literature of translation studies between (2010-2024) did not offer clear systematic practical assessments for this embedded model in the educational context of inquiry. Thus, inquiry-based learning still has the efficiency within the current learning context. Those findings based on surveys and practical meta-analyses conducted by numerous scholars such as, Furtak, et

al. [47], Lazonder and Harmsen [48], Rodríguez, et al. [5], Awajan (2023) and Gijlers and de Jong [27].

4.4. *Implementing Practical Learning*

Friedrich [49] argues that previous learning models did not fit the current technological development in the modern learning context, which incorporate with developing learners' literacies. Thus, the argument in the literature falls in favour of implementing a generic practical approach to develop learners' academic literacies as indicated by Johns [16], who mentioned four reasons for this necessity. The first reason related to the nature of learning method in developing learners' core cognitive skills. Secondly, the lack of related knowledge by methodologists. Thirdly, the importance of instructions on model's application before the application into the fields of knowledge. Fourth, systematic assessment of leaning approach in developing academic literacies. Therefore, the implementation of inquiry-based learning considered as a pedagogical solution which fulfils the necessity for a practical model to observe the entire educational process in various faculty programs [25].

4.5. *Student-Centred Learning*

Previous literature highlighted the importance of inquiry-based learning approach in developing learners' academic literacies (Furtak, et al. [47]; Keselman [50] and Wingate et.al (2021) inquiry-based learning considered as a student-centred learning approach which focused on self-development of learners' cognition. Correia and Harrison [51] indicated that inquiry-based approach tends to have complimentary embedded activities which encouraged learners to develop their awareness in terms of self-efficiencies. Moreover, they reported that inquiry-based learning encourages learners to develop their literacies by developing self-efficiencies and critical thinking skills without any assistance from educators [52]. This criterion of self-efficiency enables learners to complete the learning task and achieve designed goals by themselves. Further advantages of inquiry-based learning are enabling academic lecturers or literacy specialists to work independently or in teams to assess and develop curriculums or tasks in the learning context. This process allows them to acquire further understanding of learners' independent background knowledge and literacies development within the inquiry model.

5. Findings

5.1. *Academic Literacy in Translation*

Translation is known as a process of transferring the source text from a source language into a target one [26]. The process of translation implies certain stages identified by translation scholars which are reading source text, understanding source meaning and reformulating a source text meaning into a target language [53-55]. These stages reflect a systematic cognitive process which takes place in translators' brain during the process of translation [56]. During the translation task, the translator starts with reading a source text and classify it into the smallest understandable segments [57]. Then, the analysis stage reflected the relationship between the referential meaning of those segments and the whole meaning of a text. The last stage is reformulating the source meaning in the target language structure for acquiring similar effects on the target receptor.

The process of translation undergoes some cognitive activities of problem-solving and decision-making which inquiry-based learning develop in a systemic process. Those cognitive activities highly affected by the previous knowledge which translators acquire through learning stages within the educational context. The previous literature showed that translators who adopted inquiry-based learning had better cognitive experiences, skills and self-confidence in their tasks than other instructional approaches [25]. However, the fruitful consequences of inquiry-based learning in the cognitive activity of translation. Inquiry-based learning contributes to the development of translators' academic literacies thought developing reading, writing, analytic thinking and creating communicative abilities during the process of translation [24].

Moreover, inquiry-based learning adopts to assess a translator's ability to think critically in his work independently based on his style in making choices and selections for translation outcomes. The nature of inquiry-based learning moves together with the process of developing academic literacy skills for achieving the objectives of learning context. Additionally, it contributes to the implementation of new technologies to both translation schools and markets' applications for fostering academic success. Numerous studies by translation scholars and literacy specialists acknowledged the ability of the inquiry-based method to explain, identify, and develop learning context and cognitive activity of translation (see, Gormally, et al. [22], McWilliams and Allan [36], María and Luisa [45] and Daminova, et al. [24] the relationship between developing academic literacy, inquiry-based learning and cognitive stages of translation activity summarised as follow.

5.1.1. Reading Skills

Reading source text considered as the primary stage of the translation process for familiarising translator with initial ideas on the nature and content of the text [58]. In terms of academic literacy, reading the source text contributes in minimising the challenges which translators encounter in the analysis stage for successful interpretation of the source meaning and intended message [36]. Additionally, this initial stage enables educators and advisors to evaluate reading skills and competences which translator acquired or developed during a learning activity in a specific instructional model. The activity of learning in inquiry-based model incorporates with developing learners' critical reading skills and critical thinking skills. Besides, the development in reading skills is essential for retrieving stored knowledge and structures from long-term memory on the specific context for source and target languages [59].

5.1.2. Critical Thinking Skills

Translation process implemented in a cognitive activity of critical thinking for recalling stored knowledge and develop new knowledge related to a particular context [60]. This cognitive activity reflected the development of learners' academic literacies within the specific learning situation. Studies in the literature found that inquiry-based learning supported learners to develop literacy skills and familiarising them with crucial abilities required for developing critical thinking [58]. Development of critical thinking enables learners to evaluate the clarity, logic, perception and relevance of their analysis stage for a text. Thus, developing critical thinking skills through academic literacy enriched learners to manage the learning process systematically. Additionally, the development of academic literacy skills incorporates with current demands for developing translators' technological skills after the invention of new technologies and market demands for implementation of those new tools into the field of translation [24].

5.1.3. Formulating Skills

Many studies in the literature showed the importance of reformulation (rewriting) stage of translation. Munday [58], García and Veiga [34], Camps [35] and Baker [61] showed that target translation should convey similar effects in the target language similar to the source one under the concept of equivalence. The systematic process of cognitive application in inquiry-based learning incorporates developing translators' decision-making skills for acquiring equivalent translations in the target language. Thus, reformulation skills reflected in the ability of translators to analyse and synthesis acquired information from the source text in a target language and structure [34]. Additionally, developing self-confidence and continuous evaluation for the outcomes through inquiry-based learning incorporated in developing translators' academic literacies in producing successful translations [35]. Finally, the implementation of inquiry-based does not serve in developing learners' academic literacy only. But, it contributed in developing learners' skills for carrying out complex translation tasks across varied disciplines [5].

5.2. Toward Better Practical Model

The review of related literature showed various implementations of inquiry-based learning in various disciplines for developing learners' academic literacies. Those implementations elaborated on the triangulated relationship between learner, educator and literacy advisor for a better practical model of inquiry in developing learners' literacies. The practicality of the inquiry approach motivated educators and literacy advisors to implement this model in various educational levels. Figure 1 shows the practical application and functions of inquiry-based learning in developing translation learners' academic literacies within a practical model designed by McWilliams and Allan [36]. In addition, it designated the placement of educators and literacy advisors within the model for assessing and evolving learners' literacies. This process serves the continuous development and evaluation for the model and learners simultaneously as indicated by Kuhlthau [18], Gijlers and de Jong [27], García and Veiga [34] and Rodríguez, et al. [5].

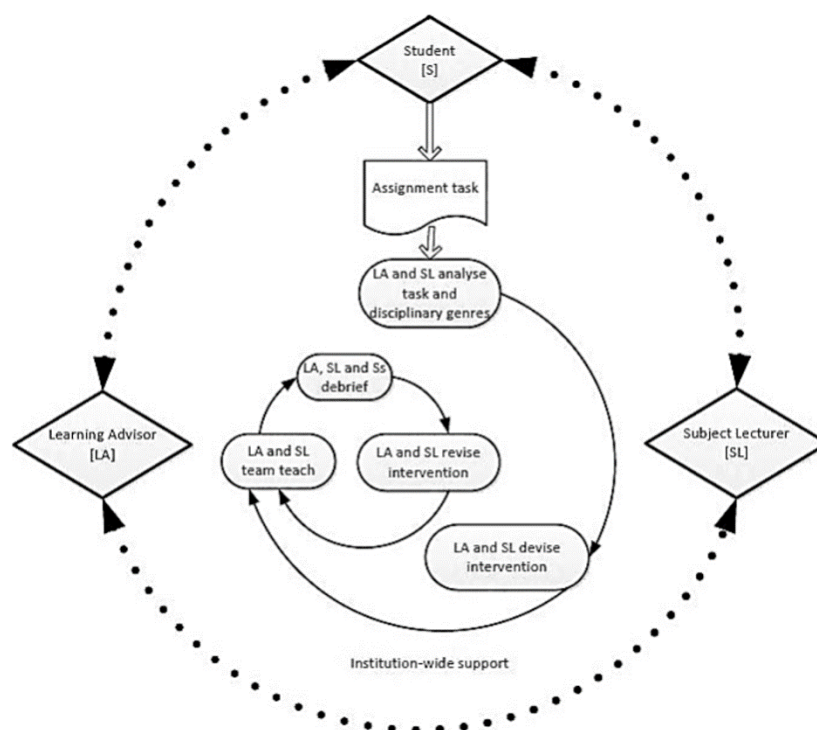


Figure 1.
Practical model of inquiry assessment adapted from McWilliams et.al. (2014).

The above model reflected the triangulation between learner, educator 'subject lecturer' and literacy advisor. The first stage started in assigning a translation task for assessing the levels of learner's literacy skills. McWilliams and Allan [36] mentioned that the task design follows one of two directions. The first direction is "reactive design" whereas, literacy specialist design specific task for evaluating learner's literacy skills. The second direction is "proactive design" when the educator 'subject lecturer' implies a translation task which uncovers the challenges or the limits of learners' literacies. The second stage includes identifying the challenges encountered during the cognitive process and the assessment of translation outcomes. While the third stage of model intervention displays the appropriate intervention or guidance required by an educator or the specialist during the educational process. This intervention or guidance ranges from one class-hour-session into weekly workshops during the academic year based on the identified level of learners' literacy development.

The fourth stage is a team-teaching stage, both educator and literacy specialist exchange feedback and ideas on the development of learners' literacies. During an ideal situation, this feedback enabled the institutions to draw a timeline for the development of learners' literacies following the time of their graduation [24]. The fifth stage of debriefing reflects the first part of the triangulated relation of this process. Each group of learners or class could nominate a representative, who assumed to offer a further explanation of the challenges encountered during the task to develop their academic literacies. The last stage of the model reflects a revision stage or evaluation for the process of developing learners' academic literacies. The construction of this model based on the spirit of constructivism theory of learning which aimed to fulfil the demands for developing and assessing learners' academic literacies in various fields [36]. Finally, this modulation should be supported by the target institutions to achieve designed objectives of learning activity.

5.3. Competence and Literacy

Before designing any model of learning, scholars categorize the necessity for developing this model and the objectives for designing a model. There are various objectives for designing various learning model based on the necessities or weaknesses in the educational context. The current model of inquiry-based learning developed for some educational necessities. The primary necessities are supporting student-centred learning and developing learners' literacy skills [36]. In terms of translation studies, learning through inquiry enables learners to develop literacy skills and educators to investigate the cognitive activity of translation in translators' brains (Baker, 2018). Additionally, inquiry-based learning empowers scholars to investigate translators' competences [2].

Jiménez-Crespo [62] claimed that translator's competence "plays a key role in translation education and an understanding of translation competence models can not only be beneficial to comprehensive organisational efforts but, also serve as a frame of reference for all parties involved: administration, coordinators, faculty, students and future employees" (p.41). Pedagogically, translation competence is a general term which refers to the development of translators' skills, literacies and performance for better translation outcomes [34]. This explanation contained the main concepts for studying translator's competence which scholars like, Beeby, et al. [63] and Lea [8] showed in their studies. Their investigations for translation competence based on identifying how those concepts work separately and reflect the whole image of competence by joining it together again.

Currently, one of the most accepted models for measuring translation competence is PACTE model developed by O'Neill [64]. They defined competence as "the underlying system of knowledge and skills needed, to be able to translate" (p.99). This model classified competence into five sub-competencies are; the strategic sub-competence, sub-competence of bilingual, sub-competence of extra-linguistic, sub-competence of instrumental and sub-competence of knowledge about translation. A developed framework of PACTE model proposed by [65]. She divided sub-competence of knowledge into two separate categories, translators' routine competence and translators' self-competence. Besides, she criticised the current process of competence application and development in translators' education.

All competence models and developed frameworks invested in analysing, understanding and developing translators' literacy skills and outcomes. Whereas, the application of inquiry-based learning went through the process of facilitating the cognitive process of translation and developing a translator's literacy systematically. Accordingly, this process served in explaining and evaluating the translator's competences. In conclusion, the previous literature indicated that the development of translators' literacy skills considered as the reflection of the development of translators' competences. This conclusion incorporated with a large number of studies carried out in the literature by scholars like Vazquez-Calvo, et al. [66], Chu, et al. [2], Baker [1] and Rodríguez, et al. [5]. Figure 2 shows the sequences of the relationships between learners' cognition, academic literacy and competences development within the cognitive process of translation.

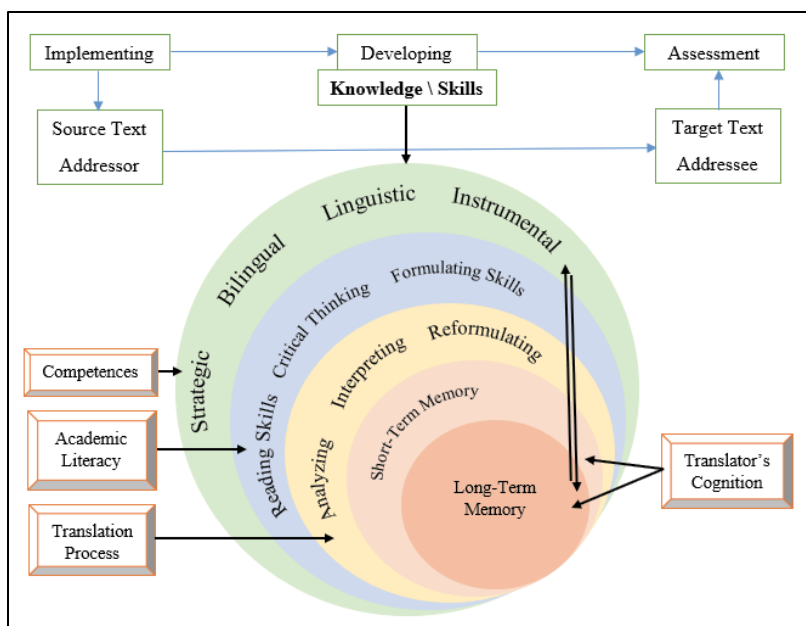


Figure 2.
Framework of translation competence development.

Figure 2 explains the interconnected relationship between the process of translators' competencies development within inquiry-based learning and the development of academic literacies within the context of translation studies. Inquiry-based learning enables translators to move forward and backwards during the process of translation through using the academic literacies of reading, critical thinking and formulation skills. This movement considers as the interconnection stage between developing translators' competences and implementing new knowledge and skills in long-term memory through the process of translation. Besides, the process of translation incorporated in retrieving and validating previously-stored knowledge which assisted translators' performance in the tasks of translation.

6. Conclusion

A careful investigation in the literature of inquiry-based learning within the field of translation showed that learning through inquiry enables translators to carry out a successful translation process and develop their literacy skills. The findings of this investigation reflect enhancement in translators' competences. Additionally, inquiry-based model empowers educators and literacy specialists to guide and evaluate the educational process of learning by conducting continuous development and assessment for translators' academic literacies. Practically, the development in translators' academic literacies showed in three views. The first is well-reading of the source text that facilitates the processes of text understanding and analysis. The second is developing a cognitive process of critical interpreting and reflection of the intended meaning for an equivalent one in a target context. Lastly, the equivalent reformulation of the source meaning in a target language.

Moreover, current investigation in the field of inquiry showed that inquiry-based learning fulfils the requirements for being a practical model of learning within translation activity. It enables translation's learners to develop cognitive processing of knowledge, along with the development of academic expertise. The stages of cognitive process enlighten the development systematically in translators' literacies within the inquiry approach. Those findings are consistent with the studies conducted by Beeby, et al. [63], Göpferich [65], Daminova, et al. [24] and Siphukhanyo and Olawale [3], who mentioned that the process of developing learners' literacies considered as a paralleled process for

developing competencies within the cognitive process of translation. In conclusion, the current review found that inquiry-based model considers as an advantageous model for developing translators' cognitive performance. These findings practically supported the claims that learning through inquiry maintained the roles of educators and literacy advisors to assess and develop translators' academic literacies as shown in the previous literature. Those findings represent the answers for the questions driven in the field of translation.

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The authors confirm that the manuscript is an honest, accurate and transparent account of the study that no vital features of the study have been omitted and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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References

- [1] M. Baker, *In other words: A coursebook on translation*. Routledge, 2011.
- [2] S. K. W. Chu, R. B. Reynolds, N. J. Tavares, M. Notari, and C. W. Y. Lee, *21st century skills development through inquiry-based learning from theory to practice*. Springer, 2021.
- [3] L. Siphukhanyo and B. E. Olawale, "Chronicle the experiences of life sciences teachers and learners on the usage of enquiry-based learning in enhancing learners' academic performance," *Journal of Culture and Values in Education*, vol. 7, no. 1, pp. 19-36, 2024.
- [4] S. Assuah, "The effect of inquiry-based learning on Senior High School students' academic performance in electricity and magnetism concepts," University of Education, Winneba, 2024.
- [5] G. Rodríguez, N. Pérez, G. Núñez, J.-E. Baños, and M. Carrió, "Developing creative and research skills through an open and interprofessional inquiry-based learning course," *BMC Medical Education*, vol. 19, no. 1, p. 134, 2019.
- [6] B. K. Khalaf, I. M. Mahmood, L. S. Al-Abbas, and S. A. Khudhur, "Necessity for artificial intelligence in higher education: Learners' motivation for continuous use of AI-powered tools," *International Journal of Innovative Research and Scientific Studies*, vol. 8, no. 2, pp. 1123-1137, 2025. <https://doi.org/10.53894/ijirss.v8i2.5413>
- [7] R. Henderson and E. Hirst, "Reframing academic literacy: Re-examining a short-course for 'disadvantaged' tertiary students," Waikato University, 2022.
- [8] M. R. Lea, "Academic literacies in theory and practice," *Literacies and Language Education*, pp. 147-158, 2023.
- [9] R. O. W. Ata, "Diagnosing the social inclusion strategies for the disabled students at the palestinian higher education," Doctoral Dissertation, AAUP, 2023.
- [10] M. Kalantzis, B. Cope, E. Chan, and L. Dalley-Trim, *Literacies*. Cambridge University Press, 2016.
- [11] F. Alves and A. L. Jakobsen, *The Routledge handbook of translation and cognition*. Routledge London, 2021.
- [12] M. Dixon-Woods, "Systematic reviews and qualitative methods," *Qualitative Research*, p. 331, 2010.
- [13] M. Borenstein, L. V. Hedges, J. Higgins, and H. R. Rothstein, *References*. Wiley Online Library, 2009.
- [14] D. Moher, A. Liberati, J. Tetzlaff, and D. G. Altman, "Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement," *Annals of internal medicine*, vol. 151, no. 4, pp. 264-269, 2009.
- [15] D. Gough, "Weight of evidence: A framework for the appraisal of the quality and relevance of evidence," *Research Papers in Education*, vol. 22, no. 2, pp. 213-228, 2007.
- [16] A. M. Johns, *Text, role and context: Developing academic literacies*. Cambridge University Press, 2010.
- [17] J. Dewey, "The Theory of Inquiry," ed: Carbondale: Southern Illinois University Press, 1994.
- [18] C. C. Kuhlthau, "Guided inquiry: School libraries in the 21st century," *School Libraries Worldwide*, vol. 16, no. 1, pp. 17-28, 2010.
- [19] H. Blumenfeld, "Impaired consciousness in epilepsy," *The Lancet Neurology*, vol. 11, no. 9, pp. 814-826, 2012.

- [20] M. C. Linn, B.-S. Eylon, A. Rafferty, and J. M. Vitale, "Designing instruction to improve lifelong inquiry learning," *Eurasia Journal of Mathematics, Science and Technology Education*, vol. 11, no. 2, pp. 217-225, 2017.
- [21] F. Qasem, "Quality improvement in maternity care: Insights from system integration simulations," *BMJ Open Quality*, vol. 14, no. 2, 2025.
- [22] C. Gormally, P. Brickman, B. Hallar, and N. Armstrong, "Effects of inquiry-based learning on students' science literacy skills and confidence," 2022.
- [23] V. Kumar, "Inquiry-based learning and its impact on teaching and learning of the humanities," 2021.
- [24] E. R. Daminova, V. V. Tarasova, and A. A. Kirpichnikova, "Academic Writing as a key component of Academic Literacy," *Turkish Online Journal of Design Art and Communication*, vol. 7, p. 698, 2021.
- [25] Y. Dimova and K. Kamarska, "REDISCOVERING JOHN DEWEY'S MODEL OF LEARNING THROUGH REFLECTIVE INQUIRY," *Problems of Education in the 21st Century*, vol. 63, 2020.
- [26] S. Bassnett, *Translation studies*. Routledge, 2023.
- [27] H. Gijlers and T. de Jong, "Using concept maps to facilitate collaborative simulation-based inquiry learning," *Journal of the Learning Sciences*, vol. 22, no. 3, pp. 340-374, 2023.
- [28] C. Manoli *et al.*, "Phases of inquiry-based learning: Definitions and the inquiry cycle," *Educational Research Review*, 2020.
- [29] P. A. Kirschner, J. Sweller, and R. E. Clark, "Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching," *Educational psychologist*, vol. 41, no. 2, pp. 75-86, 2021.
- [30] C. E. Hmelo-Silver, R. G. Duncan, and C. A. Chinn, "Scaffolding and achievement in problem-based and inquiry learning: A response to Kirschner, Sweller, and," *Educational Psychologist*, vol. 42, no. 2, pp. 99-107, 2013.
- [31] T. Kaçar, R. Terzi, İ. Arikan, and A. C. Kırıkçı, "The effect of inquiry-based learning on academic success: A meta-analysis study," *International Journal of Education and Literacy Studies*, vol. 9, no. 2, pp. 15-23, 2021.
- [32] A. Faria and G. L. Miranda, "Augmented reality in natural sciences and biology teaching: systematic literature review and meta-analysis," *Emerging Science Journal*, vol. 8, no. 4, pp. 1666-1685, 2024.
- [33] L. Alfieri, P. J. Brooks, N. J. Aldrich, and H. R. Tenenbaum, "Does discovery-based instruction enhance learning?," ed: American Psychological Association, 2014.
- [34] M. García and M. T. Veiga, "Guided inquiry and project-based learning in the field of specialised translation: A description of two learning experiences," *Perspectives*, vol. 23, no. 1, pp. 107-123, 2015.
- [35] A. Camps, "Translation, multilingualism and cultural mediation in urban societies," *Transfer*, vol. 12, no. 1-2, 2017.
- [36] R. McWilliams and Q. Allan, "Embedding academic literacy skills: Towards a best practice model," *Journal of University Teaching & Learning Practice*, vol. 11, no. 3, p. 8, 2014.
- [37] L. Leach, N. Zepke, P. Haworth, and P. Isaacs, "One size does not fit all'How five tertiary education organisations embed literacy, language and numeracy Summary report. MOE, Wellington, New Zealand, 2020.
- [38] R. M. Bean and V. J. Goatley, *The literacy specialist: Leadership and coaching for the classroom, school, and community*. Guilford Publications, 2020.
- [39] P. Strauss, "'I don't think we're seen as a nuisance'-the positioning of postgraduate learning Advisors in New Zealand Universities," *TEXT Journal of Writing and Writing Courses*, 2013.
- [40] C. G. Thies, "Multiple Identities and Scholarship in International Studies: 2019 ISA Presidential Address," *International Studies Quarterly*, vol. 64, no. 2, pp. 259-265, 2020.
- [41] T. A. Myers, S. J. Chanock, and M. J. Machiela, "LDlinkR: an R package for rapidly calculating linkage disequilibrium statistics in diverse populations," *Frontiers in genetics*, vol. 11, p. 157, 2020.
- [42] T. Pocock, M. Smith, and J. Wiles, "Recommendations for virtual qualitative health research during a pandemic," *Qualitative health research*, vol. 31, no. 13, pp. 2403-2413, 2021.
- [43] B. K. Khalaf, "Traditional and Inquiry-Based Learning Pedagogy: A Systematic Critical Review," *International Journal of Instruction*, vol. 11, no. 4, pp. 545-564, 2018.
- [44] J. E. Ormrod and B. D. Jones, *Essentials of educational psychology: Big ideas to guide effective teaching*. Pearson, 2024.
- [45] R. María and R. Luisa, "A review of the traditional and current language teaching methods," 2016.
- [46] U. Wingate, N. Andon, and A. Cogo, "Embedding academic writing instruction into subject teaching: A case study," *Active Learning in Higher Education*, vol. 12, no. 1, pp. 69-81, 2011.
- [47] E. M. Furtak, T. Seidel, H. Iverson, and D. C. Briggs, "Experimental and quasi-experimental studies of inquiry-based science teaching: A meta-analysis," *Review of Educational Research*, vol. 82, no. 3, pp. 300-329, 2012.
- [48] A. W. Lazonder and R. Harmsen, "Meta-analysis of inquiry-based learning: Effects of guidance," *Review of Educational Research*, vol. 86, no. 3, pp. 681-718, 2016.
- [49] P. Friedrich, *Teaching academic writing*, 2nd ed. Continuum Intl Pub Group, 2021.
- [50] A. Keselman, "Supporting inquiry learning by promoting normative understanding of multivariable causality," *Journal of Research in Science Teaching*, vol. 40, no. 9, pp. 898-921, 2013.
- [51] C. F. Correia and C. Harrison, "Teachers' beliefs about inquiry-based learning and its impact on formative assessment practice," *Research in Science & Technological Education*, vol. 38, no. 3, pp. 355-376, 2020.

- [52] B. Fenton-Smith, "Facilitating self-directed learning amongst international students of health sciences: The dual discourse of self-efficacy," *Journal of Academic Language and Learning*, vol. 6, no. 1, pp. A64-A76, 2022.
- [53] J. C. Catford, *A linguistic theory of translation*. London: Oxford University Press, 1965.
- [54] E. A. Nida, "Sociolinguistics and translating," *Sociolinguistics and communication*, pp. 1-49, 1986.
- [55] P. Newmark, "The curse of dogma in translation studies," 1991.
- [56] E. A. Nida, "Principles of correspondence," *The Translation Studies Reader*, vol. 3, pp. 141-155, 2000.
- [57] C. Taylor, "Systemic linguistics and translation," *Occasional Papers in Systemic Linguistics*, vol. 7, pp. 87-103, 2013.
- [58] J. Munday, *Evaluation in translation: Critical points of translator decision-making*. Routledge, 2012.
- [59] S. M. Jaeggi *et al.*, "Does excessive memory load attenuate activation in the prefrontal cortex? Load-dependent processing in single and dual tasks: Functional magnetic resonance imaging study," *NeuroImage*, vol. 19, no. 2, pp. 210-225, 2013.
- [60] G. M. Olson, S. A. Duffy, and R. L. Mack, "Thinking-out-loud as a method for studying 11 real-time comprehension processes," *New methods in reading comprehension research*, p. 253, 2018.
- [61] M. Baker, *In other words: A coursebook on translation*. Routledge, 2018.
- [62] M. A. Jiménez-Crespo, *Translation and web localization*. Routledge, 2013.
- [63] A. Beeby *et al.*, "Acquiring translation competence: hypotheses and methodological problems of a research project," *Investigating Translation*, pp. 99-106, 2010.
- [64] J. O'Neill, "The beeby-fraser ideal: Is it time to abandon it?," *Policy Quarterly*, vol. 19, no. 3, pp. 6-10, 2023.
- [65] S. Göpferich, "Towards a model of translation competence and its acquisition: The longitudinal study TransComp," *Behind the mind: Methods, Models and Results in Translation Process Research*, vol. 4, no. 4, pp. 11-37, 2021.
- [66] B. Vazquez-Calvo, L. Shafirova, L. T. Zhang, and D. Cassany, "An overview of multimodal fan translation: Fansubbing, fandubbing, fan translation of games and scanlation," *Insights into audiovisual and comic translation. Changing perspectives on films, comics and videogames*, pp. 191-213, 2019.