



The Implementation of English as Medium of Instruction: Teacher Perception in Senior High School

Silfia Helmi^{1*}, Yuli Tiarina², and Yetti Zainil³

^{1,2,3}Universitas Negeri Padang

*Corresponding author. Email: silviahelmi64@gmail.com

ABSTRACT

Globalisation leads people to learn more than they mother tongue or second language. In order to follow the world with rapid change, people force to learn English as international language. For foreign language learning, it becomes problem when the learner face another language and it is taught in school or university in order to encourage them academically better. Combination of subject and language learning becoming better use of English is high frequency and supported by language input of the teacher. In Indonesia, English is taught for normal school and the school that intentionally expected to reach international standard. There is Qualified senior high school as government decision to push citizen support national development. The students are preparing to face the learning not only subject, but also language in that subject. In English language learning, the class should serve with dominant foreign language exposure, hence it will encourage student vocabulary, proficiency in the end, beside others activities that students do out of class. EMI in language learning can be solution for internationalised education in Indonesia. The study discussed EMI implementation in Senior High School from teacher perception. The participants are English teachers that teach more than three years. Based on the analysis for those teachers, there some fact about EMI in teacher point of view. First, teacher realised that EMI is positive instruction in language learning and it will give benefit in implementation. Second, teacher have enough competency and skill to implement EMI, however the situation cannot support that EMI to standout as instruction to tach foreign language. Third, student competence if EMI is implemented still low. English is not common to the students and therefore proficiency affect they response to EMI. Last, impact to student still low and EMI has to implemented more than qualified school to see effect to the learner and follow globalisation.

Keywords: EMI, foreign language, teacher perception

1. INTRODUCTION

English is a universal and intercultural language with a large speaker population. development of sociocultural needs, technology, and education. English is used in all spheres of life [1]. English is used for many other types of communication, including trade, education, and work. In Indonesia, English is foreign language where it taught in school or course [2]. However, there are some problems found in teaching and learning English for foreign language. Both side, teacher and student. [3] and [4] (There is English as Medium of Instruction (EMI) where language in classroom play dominant role. Terminology of EMI is language practice that can be seen in the use of the language to teach non-language academic subject. [5]

EMI is influential and its popularity because it remains positive impact and feedback for the learner in the era rapid of information exchange in globalisation that serve in English language. English standout as international language. [6] give valuable comment that EMI is develop because three reason political economy, teaching and learning process, last English as top of

hierarchy of language in the world. In EMI teacher deliver the language into real life practice. Language use in classroom activity is high amount that regular class. In addition, definition of EMI still arguable among expert that EMI is close to CLIL for English language learning. In implemented, popularity and successful of EMI as instruction remain curiosity for language learner and researcher since impact are real by some practitioner. In EMI input of the language to the student is high because teacher deliver the language link with the subject. Beside successful EMI implementation, there will problem face by the teacher in classroom. Further discussion will analyse how English teacher perception in Senior High School implement EMI.

2. RELEVANT THEORITICAL REVIEW

2.1 English as Medium of Instruction

English as “hyper-central” that what De Swaan hierarchy discussed in [7]. Consequently, in line with globalisation goal: where languages used chiefly by non-native speakers across the globe for a large range of

purposes. Even though expert in applied linguistics as in [8] it is kind of new mode of colonialism, in real English quite useful for support human nowadays for cultural, economic etc. Learning English is kind of need in every country nowadays. Demand of the world and era push people to learn more to follow cultural, educational and social exchange. In the countries that are not use English such as Russia, mostly Asia it is important to in language learning for foreign language, teacher in classroom needs to provide classroom interaction with sufficient material to promote student ability in English language learning [9]. Interaction is not only movement in language learning, material, teaching method will affect student in achieve comprehensible input to reach learning outcome in the end of the study.

Active participation and teacher encouragement in language learning affect learner ability. In classroom, [10] classified things that can be implemented by the teacher to teach language such as teacher talk, reading text and sufficient task. Learning successful is not only charged to the teacher, also student. Teacher, student mentally and physical readiness, availability of the sources, learning situation. In Indonesia, English is foreign language. Hence, learner get the language learning in junior high school not from low level in beginning of formal education. Curriculum, material and school are ruled by the government [11].

Low ability of the citizen in Indonesia in using English facing globalisation makes the government take some consideration, particularly in education side. One of the decisions made is internationalise and specialised school. There was classification for high-Quality of School that qualified enough in language use that is RSBI [12] where in related school follow the term that English should be functional, then where English is media for each subject deliver in classroom activities. Hence, what is significant of EMI? The fact that the use of the English language to teach academic subjects (other than English itself) in countries or jurisdictions where the first language of the majority of the population is not English. [13]. EMI mostly used in university, (Gill & Kirkpatrick, 2013) in [14] State universities that provide EMI programs are Gadjah Mada University, University of Indonesia, and Padjadjaran University. However, RSBI has been implement in Senior High School or reputable boarding school in Indonesia. However, this level of reputable and qualified school has been ended by the government and replace with another name refer to well accredited school in Indonesia.

It is agreed that English teacher in Indonesia have to understand and comprehend the function of EMI. In order to encourage language use in communication for the student. In Indonesia, EMI could be applied in senior high school until university level. EMI is bridge for learner in achieve better in learning process, some definition lead that student will get double benefit for facing EMI in medium of instruction means that English has shifted from being taught as a foreign language alongside other disciplinary-focused courses, to becoming an important educational language used for

learning and teaching non-language-related academic subjects (e.g., studying engineering content through English; studying business degrees through English) [15]. English teachers in Indonesia minimum are undergraduate where they intake some knowledge before entering education field. The teacher learns that strategies, media and sufficient source for language influence achievement. They will relate the way to teach, source, outcome of the learning to regulation applied at the time since education policy is in government hand. In EMI, teacher know that benefit for implementation is real. EMI push the learner to EMI offers a possibility for local students to study in the foreign countries. So, by the time they come back, they will have already received prestigious diplomas and better education. Moreover, such graduates are likely to be successful at following their career ladders on the international level (Coleman, 2010). [16] English as Medium of Instruction is "media" to prepare learner's ability in language to communicate spoken and written.

Dearden in (2014) [17] In advance of technology and massive change nowadays, it leads people to learn and explore ability and competence. In following the globalization, language skill is one of the keys to new way exploring. EMI is important because countries which applied English as second or foreign language, particularly government realise that policy in education will encourage change to the student also the country. Quality of education, if one of influential to change. Implementation of EMI step forward the country to compete with other countries and global market and academic purposes. In addition, EMI implementation also opens the gate for language acquisition and language learning process.

EMI might come as solution for language learning in this era. It found in some studies [18], [19] [20] According to those studies, learner in EMI application will take the advantage such as huge vocabulary, speaking opportunity, academic privilege and etc. Language mediate learner to learn the related subject and the language itself. In English learning, it become possible to encourage language ability since the language class and use of the language are in the same time. Implementation of EMI will be found problem since the language are not originally for each country. The problem will be found in language learning, policy and teacher-student side, [21][22]. In the school, EMI is not directly understood by the student, however the teacher has to implement EMI in order to support academic level of the student. For teacher side, they have to build self-confidence and realised existence of EMI in language leaning. Successful EMI contributes by the teacher understanding EMI yet implemented in classroom. By seeing perception of the teacher about EMI will give information how EMI is known by the teacher and how EMI should be implemented in the classroom and take advantage from this English language instruction.

2.2 Teacher perception

English teacher in Indonesia have to attend minimum education in post-graduate or supplemented certification. Once they get professional teacher as civil servant, they will attend “sertifikasi” or training to encourage their skill and competence in teaching English [23]. Hence, there will no excuse for not following update in education system, arrange the curriculum, learning outcome for support national development. EMI for instance. This kind of teaching is popular more than decade, therefore implementation of EMI in Indonesia is not new thing. If the school is reputable enough, therefore the instruction like EMI should be implemented.

Perception of the teacher for EMI will affect their intention and motivation in implement EMI in classroom. Qualified School teachers should prepare themselves teach for fulfil international standard of language. Hence, they should prepare source of language input in classroom and make the language use effective and efficient. Input in EMI will affect the student as it is mentioned in classroom interaction and language input. The fact, for foreign language learning, English sometime not high frequency use. There are mother tongue and second language that related country use when they learn language. [24], studied teacher/lecture perception in application of EMI. In the related study found that EMI for language teaching is not implemented even the institution agree.

In addition, professional development of the teacher/ lecturer for EMI is really needed to support EMI goal in teaching and learning the language. In addition, institution should back up the teacher/lecturer in implemented EMI. There are some reflections for the teacher that EMI is important from [25] EMI courses give positive impact and advantage. EMI give opportunity for student gain better English proficiency. The school should select qualified professors to teach for the EMI program. (Voiced by foreign students). Student with low proficiency with face anxiety and difficulties in the class. Teachers should share the related course with national language. Different EMI courses should be offered based on students’ English levels to ease their learning pressure. (Voiced by local students). A multinational class can promote learning motivation. EMI courses are more appropriate for graduate students than for undergraduate students. EMI courses help students develop presentation skills. Courses involving learning very high-level professional knowledge are not suitable to be conducted entirely in English.

In EMI, teacher realised that, language learning and teaching will support foreign language implementation to the learner, learner is expected to be able in application of the language during activities in classroom. Hence, the teacher needs to provide learner with huge of input. In classroom, input should be come as teacher talk, extensive reading and sufficient textbook and task. [26]. The fact that, English for foreign language

Studies in the field of language learning and teaching supports the idea that a second language is learned most effectively when learners are exposed to sufficient input

of the target language. Intense exposure to English, which is promised by the implementation of EMI, becomes the rationale underpinning this practice. It is largely based on the idea that second language acquisition is similar to first language acquisition. The rationale for EMI in university level is often based on theories of acquisition which support a naturalistic process of language learning similar to first language acquisition in which learning takes place effortlessly and automatically, with the requirements that there is sufficient exposure to English and the learner is sufficiently motivated feels the need to do it.

3. METHOD

The writers used descriptive qualitative study for this mini research. Data is collected from distributed questionnaire in google form to teachers who teach in Senior High School more than three years. The school is outstanding Senior High School. The questionnaire is adapted from [27] in order to find teacher perception in implementation of EMI in Senior High School based on the adapted questionnaire, the previous researcher classified gender to see teacher perception in implementation of EMI, but in this study do not because four teachers are female with same age. The questionnaire consists of, teacher understanding of EMI, beneficial, teacher competence, student competence, effect of implementation EMI. The questionnaire has four option that is Likert-scale strongly agree-strongly disagree point for eighteen questions. Response to the questionnaire will be process in calculating for seeking high value in each question.

4. DATA ANALYSIS AND DISCUSSION

In this part, the writer intended to discuss teacher background knowledge about English as medium of instruction and continue with how the teacher perception based on the questionnaire distributed and classified into four categories. First, EMI and its benefit. From definition of English as Medium of instruction which is can be defined as English that is used in learning process or academically function that used for communication between teacher and learner who are not use English as first language therefore, teacher realised what EMI is. As guide in the classroom that been common with some of teaching method, strategies and kinds of language instruction, therefore the teacher have background knowledge of EMI. Policies of the country also set that English in education should be encourage. In addition, the teacher realises benefit of EMI. [28] mentioned some. *Boosting intercultural knowledge, better communication in related language, cross cultural understanding*. In addition, the teacher can recognise that if implementing English as medium of instruction will help the learner to get *opportunity students exchange, getting international carrier level* (Coleman 2010). [29] classified benefit of EMI into four categories such as cognitive advantages, resource availability, more exposure to English and

more chances to acquire it and the increased employability chances of students.

Second, teacher competence in implementing EMI. Since the language is not originally from its country, therefore to implement of English as Medium of instruction need qualified and competence teacher. [16] suggest that if education set that English is important and encourage learner toward the language thus the teacher need to set in high level of proficiency, mindset of the teacher in implement the EMI. Training for EMI teacher also need in order to strengthen the concept of EMI and how its implement. In addition, language policy also relates to this issue. English as medium of instruction need adapt with national policies and avoid mismatch learning goal and teacher perception.

Third, Student competence toward EMI. The English Instruction has been arisen popularity in many countries. Government and goal of leaning support EMI to implements and give chance to learner gain so much language exposure and content in the language. However, there some fact in real teaching and learning process. However, before implementation of EMI, teacher should measure learners' ability and their competence if related instruction is implemented. There will some reason and factor of EMI being success or even fail. In Asia, [30] Noted that vocabulary range and other language skills are important for implementation of EMI. Hence, Language ability lead learner into understanding the subject. In addition, psychological factor also plays the role that learner has self-esteem issue while learning in EMI.

Fourth, and effect if the student is exposed to EMI in teaching and learning process. [31] classified some effect if EMI is implemented in learning. First, academic competence where learner can achieve high level of thinking and give them opportunity in learning with bridges by the language. Second, learner can achieve better language proficiency. Hence, by high exposure of the language will ease them to understand the language and make them common with language aspect such as vocabulary, pronunciation, phonology and other.

In this part, the writer classified the information based on the questionnaire and discussed base on related theory. Based on the table above, there are some points to see in English teachers in seeing implementation of EMI in classroom. There are four points that will discuss. First, EMI and its implementation is common for teacher. EMI is popular around the world as instruction to teach foreign language

Table 1. The Implementation of EMI

Indicator	Score
Know EMI and benefit	2,6
Teacher competence	2,8
Student competence	2,25
Effect to the student	2,25

4.1 Know EMI and benefit

EMI is expected to increase student ability to use the language. Use of native language in the classroom and

EMI's benefit give picture that English with implementation of EMI will give positive impact to the student. In point where EMI's terminology and its benefit, the teacher agree that they knew EMI is. Based on the qualification of the teacher for English, they should graduate from English major for S1 minimum. Therefore, any kind of strategies and the way language should be delivered in the class, the teacher knew. Score (2,6) means that, background knowledge and impact of EMI for language learning are understood by the teacher.

Useful of EMI in classroom for foreign language learning is fact that teacher know. Qualified School and regulation in Indonesia lead teacher can follow era. Sufficient curriculum and enough training of the teacher to teach in the class give knowledge that EMI will bring positive effect to classroom learning. EMI, RSBI and other level of qualified school are equivalent one. It is because expected result of these learning is for qualified student to get better education opportunity in university that give contribution to development of the country. Based on the respond of the participant, mean that teacher have background knowledge toward EMI and its benefit. Hence, they realised if implemented EMI give student opportunity academically and application of the language. For academic they will achieve better score in exam, assignment. For language, they will get proficiency and better understanding in related language.

4.2 Teacher competence

Second, in this study, Teachers' competence toward EMI also discussed. Based on the table stated that teacher score (2,8). Based on three classifications of teacher in implemented EMI, the score is highest one. It is real that teacher know EMI and they have sufficient knowledge to practice EMI. Teacher realized that EMI is an instruction that give them opportunity to teach more than just language, but real application of the language. Based on distributed questionnaire, it can be concluded that teacher have enough skill to implemented in classroom. However, the data do not provide competence of the teacher exactly such as their proficiency. The questionnaire provides the statement that their possibility to teach with EMI due to their competence previously. Based on the questionnaire that, they agree that having ability to teach with EMI.

4.3 Student competence

It is in line with previous discussion that student have low level understanding and proficiency for English. Score for (2,25) means that, teacher competence is not balance with student competence to absorb the knowledge from the teacher. In addition, background of English for foreign language in Indonesia. In order to deliver the concept and topic of learning, the teacher tend to use local language and Bahasa Indonesia. The problem of student's competence can be solved if the teacher can maintain the student with language input, conducive learning environment and other beneficial step to help student in with EMI implementation. Indeed, some problems come when implemented EMI, where students

cannot understand and lack of attention to the student. The student tends to get into the topic if the mother tongue is used, not for English application while deliver the concept in learning process. Qualified School is qualified school with better filtering student to enter.

In addition, qualified school cannot be guarantee if English for foreign language can be deliver well or apply efficiently. There will problem face by the skillful teacher to teach the student with low proficiency or understanding in English. In this case, EMI should be common for each teacher and implemented more in Indonesia. EMI will give positive contribution if mostly applicable for many schools. English should teach well from lower level or introduce early to the student to make student familiar with related language. Hence, when they face EMI, both subject and language run well together.

4.4 Effect to the student

Last point that also get lower score in this discussion is effect EMI to the student. Effect is correlated with achievement in language learning. Academically the participant 50% answered that implementation of English as Medium of instruction help learner to get opportunity entering reputable university and better score for national examination. The information that contains in related questionnaire also reveal that, English as medium of Instruction did not harm to language learning, language application. Therefore, EMI will give learner opportunity to know the language more. Hence, exposure to the language will help learner increase their proficiency and other language skill.

4. CONCLUSION

In conclusion, the current study gives information for four important teachers perspective in implementation of EMI in teaching and learning process regarding the instructional strategies in implementing EMI in senior high school student in Indonesia. The findings suggest that school should see student as learner that not have high level of proficiency and help them to achieve better result of the learning. Teachers have to implement EMI based on their knowledge toward EMI, provide activities associated with English learning to promote student's motivation in learning English and language development. The participants give comment into language use of the teacher that will affect learner proficiency. The more learner exposes to the language, the more learner understands it. However, it still needs guidance and collaborative teacher and student in classroom activities.

ACKNOWLEDGMENTS

I would like to express my special thanks of gratitude to my advisors, Mrs. Yuli Tiarina and Mrs. Yetti Zainil, for the guidance and the support to complete this study. Besides, I also wanted to say thank to people who give positive contribution such as participants, friends and committee of the conference.

REFERENCES

- [1] D. Crystal, *English as a global language, Second edition*. Cambridge, 2003.
- [2] K. Ulfa, "Designing ESP Materials For Tourism Students Of Akademi Pariwisata Medan," *Pelita, Informatika Budi Darma*, vol. XI No 2, Mar. 2015, [Online]. Available: www.stmik-budidarama.ac.id
- [3] B. Senjahari, Desfitranita, and M. Kustati, "Learning objectives and environments: How do they affect students' motivation in english language learning?," *Studies in English Language and Education*, vol. 8, no. 2, pp. 492–507, 2021, doi: 10.24815/siele.v8i2.18523.
- [4] M. Ali and A. Baroto, "The Effect Of Language Input, Learning Environment and Motivation Toward Second Language Acquisition," *Linguistic, Literature and Language Teaching*, 2017, Accessed: Jul. 04, 2022. [Online]. Available: <http://jurnal.uin-antasari.ac.id/index.php/let/article/view/1456>
- [5] J. Zhao and L. Quentin Dixon, *English-Medium Instruction in Chinese Universities*. Routledge, 2017. [Online]. Available: www.routledge.com
- [6] W. Tsou and S.-M. Kao, *English as a Medium of Instruction in Higher Education Implementations and Classroom Practices in Taiwan*, vol. 8. Springer, 2017. doi: 10.1007/978-981-10-4645-2.
- [7] V. Cook and L. Wei, *Contemporary Applied Linguistics Volume 1 Language Teaching And Learning*, vol. 1. London: Continuum International Publishing Group, 2009.
- [8] D. Block and D. Cameron, *Globalization and Language Teaching*. Taylor& Francis, 2002.
- [9] Y. Zainil, "An Analysis Of Language Input In EFL Classrooms At Junior High Schools In Padang," *Advances in Social Science, Education and Humanities Research*, vol. 276, 2019.
- [10] Y. N. Fajriah, "Comprehensible Input, Explicit Teaching, And Corrective Feedback In Genre Based Approach To Teaching Spoken Hortatory Exposition Text," *English Education and Applied Linguistics (EEAL) Journal*, vol. 10, no. 1, 2020.
- [11] B. Leigh, *Learning and Knowing Boundaries: Schooling in New Order Indonesia*, vol. 14, no. 1. 1999.

- [12] D. S. Dharmaningtias, "PPenghapusan Kebijakan Rintisan Sekolah Berstandar Internasional (Rsbi)(RSBI)," *Politika*, vol. 4 No.2, 2013, [Online]. Available: http://staff.uny.ac.id/sites/default/files/AKA_R_IDEOLOGIS_
- [13] British Council, "The state of English as Medium of Instruction (EMI) in Higher Education Institutions in Indonesia," 2022.
- [14] M. R. Tanjung, Azwandi, and Sufiyandi, "Students' Perceptions on the Use of English as Medium of Instruction (EMI) in International Class," *Journal of English Education and Teaching*, vol. 5 No.4, 2021.
- [15] H. Rose, J. Mckinley, X. Xu, and S. Zhou, *Investigating policy and implementation of English-medium instruction in higher education institutions in China*. 2020. [Online]. Available: www.britishcouncil.org
- [16] H. Bowles and A. C. Murphy, *English-Medium Instruction and the Internationalization of Universities*. Palgrave Macmillan, 2020. doi: <https://doi.org/10.1007/978-3-030-47860-5>.
- [17] D. E. Lestari, "Behind The Improvement Of Students' English Proficiency In An Emi University," *Jurnal SMART*, 2020, doi: 10.26638/js.981.203X.
- [18] A. S. Ratna, "Controversy behind Applying EMI (English as the Medium of Instruction) among EFL Students," *Advances in Social Science, Education and Humanities Research*, vol. 82, 2017.
- [19] M. Arif and A. Hakim, "Revealing the Potential Impacts of English-Medium Instruction(EMI) in Indonesian Higher Education Context," *Journal of Language Teaching and Learning, Linguistics and Literature*, vol. 9, no. 2, pp. 461–472, 2021, doi: 10.24256/ideas.v9i2.2343.
- [20] D. A. Setoningsih, "Secondary Education Students' and Teachers' Perspectives on EMI," *English Learning Innovation*, vol. 3, no. 1, pp. 17–26, Feb. 2022, doi: 10.22219/englie.v3i1.19793.
- [21] Henni and F. L. Siregar, "Survey On The Implementation Of English As The Medium Of Instruction (Emi) By Selected Senior High-School Teachers Survei Terhadap Implementasi Bahasa Inggris Sebagai Bahasa Pengantar Di Kelas Oleh Sejumlah Guru Sekolah Menengah Atas," *Jurnal Ilmiah Aurora. Sastra Budaya dan Bahasa*, vol. 1 No.1, Apr. 2013.
- [22] E. Ernawati, S. Sofendi, and S. Silvhiany, "English as a Medium of Instruction (EMI): A primary school teachers' and students' perceptions," *International Journal of Research in Counseling and Education*, vol. 5, no. 1, p. 24, Jul. 2021, doi: 10.24036/00414za0002.
- [23] H. S. Siregar, S. Mirizon, and I. Petrus, "Continuing Professional Development (CPD) of Senior High School Teachers of English," vol. 5, no. 2, 2021, [Online]. Available: <https://ojs.unm.ac.id/eralingua>
- [24] M. Guarda and F. Helm, "A survey of lecturers' needs and feedback on EMI training Yin Yang: a New Perspective on Culture View project PRE-PRINT- A survey of lecturers' needs and feedback on EMI training," *Academia*, 2018, [Online]. Available: <https://www.researchgate.net/publication/317101912>
- [25] D.-F. Huang, "Exploring and Assessing Effectiveness of English Medium Instruction Courses: The Students' Perspectives," *Procedia Soc Behav Sci*, vol. 173, pp. 71–78, Feb. 2015, doi: 10.1016/j.sbspro.2015.02.033.
- [26] Khaldi Annisa, "The importance of input in the ELT classroom," Dec. 2017.
- [27] A. Saeed, T. Iqbal, R. Azam, and R. A., "Perceptions of Teachers regarding English-medium Instructions at Secondary Education in Punjab Province of Pakistan," *Secondary Education Journal*, vol. 1, pp. 41–53, 2017.
- [28] A. G. Tamtam, F. Gallagher, A. G. Olabi, and S. Naher, "A Comparative Study of the Implementation of EMI in Europe, Asia and Africa," *Procedia Soc Behav Sci*, vol. 47, pp. 1417–1425, 2012, doi: 10.1016/j.sbspro.2012.06.836.
- [29] Y. H. Phuong and T. T. Nguyen, "Students' Perceptions Towards the Benefits and Drawbacks of EMI Classes," *English Language Teaching*, vol. 12, no. 5, p. 88, Apr. 2019, doi: 10.5539/elt.v12n5p88.
- [30] N. T. Tran, T. B. T. Tran, and T. T. M. Bien, "An Exploration of the Factors Hindering Students' Lesson Comprehension in EMI Classes," *International Journal of Language and Literary Studies*, vol. 2, no. 3, pp. 29–42, Sep. 2020, doi: 10.36892/ijlls.v2i3.317.

- [31] M. Arif and A. Hakim, “Revealing the Potential Impacts of English-Medium Instruction(EMI) in Indonesian Higher Education Context,” *IDEAS Journal of Language Teaching and Learning, Linguistics and Literature*, vol. 9, no. 2, pp. 461–472, Dec. 2021, doi: 10.24256/ideas.v9i2.2343.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

