CHAPTER 2

CHAPTER 2 | REVIEW OF RELATED LITERATURE

2.1. Introduction

A literature review is an overview and analysis of past research conducted on the issue by a wide range of academics. This chapter entails an extensive collection of the literature available on the OER. The chapter covers studies that were conducted at international and national levels on OER. The present literature review is categorized under the following heads:

- Attitude and perception about OER
- Awareness about OER and CC Licenses
- Adoption of OER
- Factors facilitating OER adoption
- Demographic variables affecting OER adoption
- Benefits of OER in teaching-learning process and professional development
- Challenges towards OER adoption

2.2. Studies conducted at the International level

2.2.1. *Literature review related to attitude and perception about OER*

Past research performed by Percy and Belle (2012); Abeywardena, Dhanarajan and Chan (2012); Jurado and Pettersson (2015); Pande, Singh, Intaratat and Mythili (2019); Nkwenti and Abeywardena (2019); Alkhasawneh (2020); Karipi (2020); Okwu, Ogunbodede, and Suleiman (2023) indicated that most of the teachers have a positive attitude towards sharing and using OER. Teachers are intrinsically motivated to share and contribute to OER for the dissemination of ideas in a knowledge society, as well as for their professional growth and personal satisfaction. Teachers believe that OERs are beneficial for sharing, as well as receiving professional respect and the ability to get feedback (Ehlers, Dauksiene, Sadauskas and Tereseviciene, 2019). Ganapathy, Chee Pei Wei, Vighnarajah, and Jong (2015) discovered that the teachers had a positive attitude towards sharing resources to make teaching and learning more interactive and efficient. Nkwenti and Abeywardena (2019) revealed that teachers view OER as very strategic in terms of accommodating the various needs of learners, as well as increasing their engagement, satisfaction, grade scores, level of independence, and providing a pathway for peer collaboration to improve their productivity. Most teachers agreed that OERs met or exceeded their expectations for comprehensiveness, reliability of sources, accuracy, quality of instruction, application

of professional standards, and the availability of evidence-based content (Rambow, 2020). Al-Zahrani (2023) discovered that faculty members possess a moderate perception regarding the ease of modification and the overall quality of OER. Even though the teachers had positive views on the benefits of OER and attitudes towards publishing their course materials, it was found that legal issues prevented them from effective application (Kursun, Cagiltay and Can, 2014). Rolfe (2012) concluded in the study that the faculty have a positive academic culture, and overcoming the lack of understanding and eliminating the barriers to sharing will lead to assist in developing open educational practices, which will benefit the faculty staff and the worldwide community. Teachers recognised OERs as digital and non-digital materials available at their institutions that can be used to stimulate classroom discourse, increase engagement between lecturers and students, and boost student achievement (Ojo, Salawu, and Adedapo, 2023). Hussain, Chandio and Khan Sindher (2013) revealed that university academia acknowledged the use of OERs in promoting higher education. They believed that OERs facilitated them in conducting research, accessing instructional materials and learning about innovations and developments in their respective disciplines. They viewed OERs as a way to have a wide range of free knowledge, latest research practices and instructional experiences. Tlili, Ofosu and Zhang (2021) found that the educators had a favourable pedagogical belief regarding OER. This was based on the fact that they believed that OERs are relevant, up-to-date and innovative teaching experiences as well as high-quality design and engaging teaching experiences for their students. In contrast to the above literature, the studies conducted by Awujoola and Phillips (2020) claimed that teachers have a moderate negative perception of CC licenses. Richter and Ehlers (2011) in their study revealed the fact that German teachers do not feel they need special OER licenses as everything is available on the Internet as being public – even their products. Moreover, Sunar, Yükseltürk, and Duru (2022) claimed that academics who were unfamiliar with OERs before the pandemic were still indifferent to adopting OER, even if they have online teaching experience. However, the studies carried out by Madiba (2018) observed that the lecturers hold mixed opinions about the integration of OERs within the context of the teaching and learning process. One of the studies, evaluated by Nobes and Harris (2019) discovered the fact that the majority of participants favoured the CC-BY-NC-ND license, which is the most restricted option available, demonstrating that they were

concerned about the commercial usage of their work. Despite this, studies concluded that teachers expressed a willingness to take part in any forums that were geared towards the creation, implementation, and promotion of OER in teaching and learning.

2.2.2. *Literature review related to awareness about OER and CC Licenses*

The research studies conducted by Richter and Ehlers (2011); Rolfe (2012); Allen and Seaman (2014); Cote (2017); Madiba (2018); Martin (2018); Sunar, Yükseltürk, and Duru (2022) establishes that teachers often fail to comprehend the concept of OER and CC licences. Thompson, Lantz and Sullivan (2019) investigated OER awareness of pre-service teachers at James Madison University. The analysis revealed that JMU pre-service teachers know more about copyright and public domain than about CC licensing, and in fact, many of the respondents would not include CC licenses in a description of OER. This proved that even though they are familiar with OER materials, they might not be familiar with the OER concept itself. Chen and Panda (2013) indicated that while the teachers had a general awareness of OERs, they misunderstood all web resources as being OER. Also, Ozdemir and Bonk (2017) emphasised a prevalent misconception among K-12 teachers regarding the difference between openly licenced content and other digital education resources. According to Forgette (2020), even though teachers are not completely aware of the term 'OER', they are incorporating OER into their curricula as supplementary materials. This highlights a possible gap between practice and understanding, emphasising the importance for teachers to fully grasp the nature and advantages of OER to use and create it effectively. Similarly, the studies carried out by Assaf, Nehmeh, and Antoun (2022), Karipi (2020); Karipi, Mawela, and Van-Wyk (2022) revealed that the OER users expressed their willingness to distribute their resources to others, or are open to discovering more about OER, however there prevails a misconception about OER due to their limited knowledge regarding the open licences associated with these materials. Awujoola and Phillips (2020); Peregrino, Caballes, and Javillonar (2020); Bharti and Leonard (2021) and Kassab and Altawalbeh (2023) examined the extent to which faculty members were aware of the use of OER, indicating that the degree of awareness among faculty members regarding the use of OER is moderate. Whereas, the results of Falode, Ilufoye, Awoyemi, and Usman (2018); Torto (2019); Nobes and Harris (2019); Ogunbodede, Nwachokor, and Aminikpo (2021) identified faculty had a high level of OER awareness and prior knowledge of CC licenses. Okonkwo (2012)

showed that while the participants are familiar with OER, they are not utilizing them to their full potential or for the goals they were designed to serve in a dynamic educational setting. Thus, Appiah, Essel and Amankwa (2020) realized that there is a great need for awareness and encouragement among the students and instructors in the classrooms of the 21st century for the adoption of OER.

2.2.3. *Literature review related to adoption of OER*

Abeywardena, Dhanarajan and Chan (2012) undertook a study among academicians to know the use of digital resources and the use of OER in various Asian regions. The research presented that 65% of the participants had used OER from other academics in their teaching and 80% mentioned that they will use OER in their teaching in the future. Chen and Panda (2013) found in their study that teachers used OER primarily for teaching content, relevant research, and for adopting teaching methods. Buluma (2013) tried to explore lecturers' and teacher trainees' utilization of OER in the different teacher education programs offered at Makerere University and Kyambogo University. The study revealed that there is minimal use of different forms of OER at both universities. Some lecturers have adopted the use of OER in different pedagogical settings at Kyambogo University and Makerere University. Jongsermtrakoon and Nasongkhla (2015) conducted a study to know the OER levels of usage in terms of the four R's framework. It was discovered that the most common kind of OER used by them was the remix format, while the redistribute format had the lowest level of openness. Al-Zahrani (2023) discovered that faculty members use class presentations, images, and videos as the most prevalent OER content, indicating their efficacy in enhancing instructional materials. Teachers included OER in their class plans as supplementary materials for students, as well as in their coursework and research, as evidenced by the studies performed by Karipi (2020) and Bharti and Leonard (2021). The research carried out by Nkwenti and Abeywardena (2019) claimed that teachers have the intention to utilise OER in order to augment their knowledge, raise awareness about the importance of using OER in teaching and learning, and utilise OER to facilitate the professional development of teachers. According to the findings of Lantrip and Ray (2020), instructors modified OER content during the adoption process and changed their instructional practices after adoption. The result of the study carried out by Elder, Larson, Thornton, and Cross (2020) showed the most commonly reported

approach is adaption, followed by creation and a combination of creation and adaption. Further, teachers were interested in using OER for reasons like its cost-effective nature, finding materials for their specialised fields, the availability of constantly updated resources, and the opportunity to share original research with their field. Symmons (2021); Fischer, et al. (2020); Muganda, Samzugi and Mallinson (2016) reported that educators were most motivated to use OERs to reduce the financial burdens placed on their students, access to updated teaching and learning material, pedagogical advantages and customization, easy access for students and faculty, general willingness to experiment, support high-quality education, learning, and research. Rambow (2020) demonstrated that saving money is the primary motivation for adopting OERs, followed by flexibility, easy accessibility, teacher engagement, ownership and variety of course material and real-life applicability. Furthermore, teachers utilised OER as a means to supplement their students' coursework or to seek out educational videos. Bond, Huddleston and Sapp (2021) discovered that most faculties make use of OER, rather than develop any OER. Supporting this result, another study performed by Nobes and Harris (2019) discovered in their research that only 20% of faculty had published their work under a CC license. Further, Pulker (2019) carried out a study on the practices of teachers through the adoption of OER for online language teaching. According to the findings of the study, teachers prefer to choose resources that they can modify to accommodate their pedagogical approaches and the specific requirements of their classes, but those same teachers are hesitant to make their modified materials publicly available. It was also discovered that reusing OER encourages self-reflection and has the potential to play a significant role in the growth of teachers as online educators. The reuse of OER helps teachers improve their technical online skills, but it does so without requiring them to alter their online teaching strategies or their core beliefs. It is common practice to obtain materials that are difficult or time-consuming to build in the first place from third parties and then reuse them without making any modifications. Educators frequently develop their materials in order to meet the demand for materials that are more tailored to individual circumstances (Baas and Schuwer, 2020). Baas, Admiraal and Berg (2019) researched to investigate the adoption of OER by teachers in higher education. Using the OER adoption pyramid as a guiding structure, the research attempts to explore the use of OER inside a Dutch University of Applied Sciences. The findings of the study indicate

that there is some informal sharing of educational resources within networks of teachers; nonetheless, the utilization of OER is very limited. The teachers either used the OER in its original form or simply used it as a source of inspiration. Admiraal (2021) concluded that most educators modify OER to meet their specific needs, enhance their teaching methods, get fresh insights and knowledge, or learn about a topic on their own, whereas many fewer educators report developing, publishing, or adding OER. The most frequently used OER were videos, images and open textbooks. While, Llanda (2023) found that faculty mostly used videos, lectures, images, and website links. YouTube, specifically YouTubeEdu and YouTube School, TED Talks and TED-Ed, and Khan Academy were identified as the most frequently used OER repositories. The results indicated that the majority of faculty members intend to adopt OER. Ogunbodede, Nwachokor, and Aminikpo (2021) also found that the lecturers use a wide range of OER extensively in their teaching. Ojo, Salawu, and Adedapo (2023) showed that lecturers were prepared and actively used OERs in education like Netex, to develop personalised learning materials for the learners and integrate dynamic features like audio, video, and self-evaluation into course content. Thus, based on the findings of the study by Fulgencio (2018) it can be determined that faculty members who wanted to gain greater control over scholarly publications and instructional resources engaged more in OER initiatives. Karataş, Yılmaz, Karataş, and Banyard (2022) established that academics displayed both the intention and utilization of OER as a means to enhance their professional development. Academics tend to rely more heavily on pre-existing resources rather than creating their OERs. Moreover, the utilization of educational electronic resources has the potential to enhance professional growth, irrespective of geographical location or educational level.

2.2.4. *Literature review related to factors facilitating OER adoption*

Rolfe (2012) found that academic staff are motivated to utilize OER due to factors, such as strong confidence in the value of open education, the capability of OER to improve individual and institutional reputations, and financial considerations. According to Kursun, Cagiltay and Can (2014), intellectual property protection mechanisms were considered to be the single most important incentive for promoting their involvement in the field of OER. Kelly (2014) intends to study educator perception with a specific emphasis on self-efficacy. The study concluded that the

quality of the design of OER, ease of use, and higher levels of self-efficacy are necessary conditions for the adoption of OER. Freeman, Tang, and Geary (2022) discovered that instructors prioritise several key factors when choosing an OER textbook. These factors include the clarity and accessibility of the writing, the comprehensiveness of the content coverage, and the cost and price implications for students. Jurado and Pettersson (2015) concluded that raising awareness about OER is an essential step towards making higher education accessible to a wider range of learners. Sambo, Utin, and Udo (2016) suggested that integrated science teachers should be given an effective re-orientation on the availability of OER in the contemporary age. While, Prisco (2016) assured that the capacity to modify, repurpose, and distribute OER is the factor that contributes to the acceptance or non-adoption of OER by academic institutions. Along with the capacity, to facilitate the adoption of OER in higher education, faculty members have identified many supports, including institutional time and resources, as well as projects and grants with financial assistance. According to Okonkwo (2012); Nkwenti and Abeywardena (2019); Ehlers, Dauksiene, Sadauskas and Tereseviciene, (2019); teachers need further training and guidance to be able to perform the tasks associated with the use of OER and institutional encouragement to create and use OER for teaching. Karipi's (2020) result showed several diverse initiatives, including OER advocacy, technological enhancement, and policy implementation, that have been proposed by faculty members as ways to encourage the use of OER in teaching and learning. According to Elder, Larson, Thornton, and Cross (2020), the most needed support for the adoption of OER includes assistance in finding OER materials, specialised support in specific disciplines, financial incentives, and guidance in instructional design. Bond, Huddleston and Sapp (2021) found that financial assistance of faculty using OER and training opportunities were cited most frequently as efforts to boost faculty OER creation. Similarly, Oelfke et al. (2021) also expressed that the process of implementing OER required a substantial amount of time and suggested that faculty should receive compensation for their efforts in developing and integrating OER materials into future classes. Assaf, Nehmeh, and Antoun (2022) suggested that the enforcement of a national policy for e-learning is important to effectively utilise OER and empower teachers to become knowledge creators. Muganda, Samzugi and Mallinson (2016) believed that it is extremely important to design an OER policy to

govern OER production, integration, and utilization. Chae and Jenkins (2015) also identified different types of support, such as department and college endorsements, specific policy direction around OER use, training on specific OER use techniques and practices, simple and organized access to OER, a local support system consisting of local experts, department-level policy, collaboration and professional development, intercampus partnerships, and funding opportunities, that could facilitate faculty in integrating OER into their teaching. Hassall and Lewis (2017) recommended that to broaden the adoption of OERs in physiology and medical education, certain steps need to be taken. These steps include a greater emphasis on OER awareness, greater institutional support in terms of time, training, and copyright protection and a greater emphasis on the sharing of diverse OERs that can be adapted to a variety of educational pursuits. Cox and Trotter (2017a) tried to explore the factors that shape lectures' decisions in the adoption of OER at three South African universities. Findings showed that infrastructural availability, legal permission, conceptual awareness, technical capacity, material availability, and individual or institutional volition are all influenced by prevalent cultural and socioeconomic variables, which in turn influence OER adoption at an institution. The survey also discovered that lecturers adopt OER because of their convictions about OER, its instructional value, and societal expectations. Nwesri (2019) believe that a reliable internet connection, access to digital libraries, a dedicated website to host their contributions, and financial assistance for the development of OER will encourage their use and development.

Kandiero (2015) found educators' performance expectancy (OER enhancing teaching performance), effort expectancy (perceived easiness to find and customize OER), and social influence (perceived opinion of their peer educators) have a statistically significant positive effect on OER adoption. Nonetheless, educators felt that institutional support, such as OER-friendly regulations, official OER project enactment, and OER-related incentives, is much needed for the adoption of OER. In another study by Jung and Lee (2019), habit was identified as the most powerful predictor of educators' intentions to adopt OER in their teaching. OER was found to be significantly influenced by factors such as price value, performance expectancy, and social influence; however, effort expectancy, enabling conditions, and hedonic motivation were not found to be significant predictors. Cultural differences have a major significant impact on behavioural intentions regarding OER adoption. Tang, Lin

and Qian (2020) undertook a study to investigate the relationship between determinants of K-12 educators' intention to adopt OER and to study the K-12 teachers' perceptions of OER adoption. The study found that perceived ease of use and perceived usefulness predicted K-12 teachers' intention to adopt OER with attitudes toward OER as a mediating variable. Villanueva and Dolom (2018) investigated that the adoption of OER by teachers in rural public high schools can be predicted by factors such as attitude, subjective norms, and perceived behavioural control. The results indicated that attitude and perceived behavioural control, including perceived self-efficacy and learning autonomy, were important factors that influenced the adoption of OER. This implies that for teachers working in rural public high schools, the value of OER and their ability to manage how those OERs are used could inspire them to incorporate OER into their teaching practices. Asghar, Erdoğmuş, and Seitamaa-Hakkarainen (2021) focused on the various social, psychological, and cultural factors that influence the intentions of pre-service teachers to use OER. The results of the study demonstrated that perceived behavioural control has a strong and positive impact on the intentions of pre-service teachers to use OER. The findings revealed that the personal culture of pre-service teachers had an impact on their willingness to use OERs and that the intentions of pre-service teachers have a positive and significant impact on their actual behaviour in using OER. Bello, Nsofor, Falode, and Adamu (2021) disclosed that lecturers' utilisation of shared OER is primarily influenced by performance expectancy and social influence. The variables of performance expectancy, effort expectancy, social influence, and facilitating conditions impact lecturers' attitudes towards using the knowledge shared on the OER repository. Otto (2021) researched to determine whether feelings and emotions or knowledge and beliefs are the primary drivers of intention and behaviour regarding OER. The findings reveal that intention and behaviour are connected with strong emotions and feelings regarding the utilization of OER. It is notable that, between the cognitive and affective components, the affective component appears to be the more important aspect in determining whether or not the participants will engage in OER. Cai, Dong, Li, and Wong (2023) sought to examine the impact of OER-related factors, teacher-related factors, and school-related factors on the use of OER by teachers. The research revealed that OER-related variables, particularly the pedagogical quality and content quality exhibit a greater capacity to predict the extent to which teachers use

OER. Regarding school-related factors, the use of OER among Chinese K-12 teachers is positively influenced by the school culture support and technological support. Conversely, leadership support has a negative effect on the adoption of OER. Regarding factors related to teachers, the study determined that only the self-efficacy of teachers in utilizing OER has a positive impact on the use of OER in China.

However, Wright (2018) demonstrated that the perceptions of stakeholders are a crucial facet in the adoption and diffusion of OER. Krelja Kurelovic (2018) concluded that in order to further expand the use of OER, it is not sufficient to merely develop infrastructure, select technology, and provide content; it also needs to foster the mindset of open access culture on the individual, professional and institutional levels. To ensure that the future generation of educators is aware of the advantages of using OER content, the researchers advocated for the inclusion of a course concerning OER usage as a prerequisite in the curriculum for teacher training (Haas, Ebner, and Schon, 2018). McKerlich, Ives and McGreal (2013) identified the factors that encourage the usage and creation of OER such as academic quality, expertise, administrative support, availability of hardware and software materials, time, environment, recognition, and incentive. According to the findings of Jung and Hong (2016), the four primary instructional reasons or priorities for which faculty members adopted OER were efficacy, efficiency, attractiveness, and extension. Inegbedion and Opateye (2018) showed that academic staff in single-mode institutions receive higher incentives that promote OER than academics in dual-mode institutions. It is necessary to have the cooperation of an institution to make effective use of OER in distance education. Rodes, Gewerc-Barujel and Llamas-Nistal (2019) found that the creation of OER is encouraged for a variety of reasons, including the promotion of professionalization and academic development; the pleasure and willingness to create OER, and so on. Haupt (2023) aimed to examine the relationship between faculty members' awareness of OER and their perceptions of OER as a feasible substitute or supplement to traditional publisher textbooks and resources. The study did not find a significant relationship between faculty awareness of OER and faculty perceptions of OER. The findings indicate that in order to enhance the utilisation of OER, educational institutions should offer faculty professional development and administrative support, promote the accessibility and advantages of OER and also address the concerns regarding quality and intellectual property rights.

Herbert, Clinton-Lisell, and Stupnisky (2023) revealed that faculty members who had the highest levels of autonomous motivation for OER were the most knowledgeable about OER textbooks. The study concludes that autonomous/intrinsic motivation was found to be the most significant positive predictor of both current and future OER textbook use.

Llanda (2023) discovered that teachers with higher self-efficacy, peer influence, and facilitating conditions have a greater intent to use OER in their teaching practices. Faculty members' strong belief in educational opportunity, their desire to provide low-cost academic content and their quest for pedagogical freedom were important factors that motivated them to embrace OER in their teaching practices (Chae and Jenkins, 2015). Carson (2020) pointed out some of the key strategies that promote OER adoption like the provision of training of staff members on OER; developing high-quality OER with supplementary resources; allocating time, support, and compensation to facilitate the integration of OER into courses or the creation of OER, and fostering collaboration and networking at both institutional and provincial levels. According to the result of Azadbakht and Schultz (2022), it was discovered that accessible OER relies on collaboration, the expertise and dedication of diverse teams, and the broader OER community. Financial support, particularly for compensating staff and students, as well as providing faculty creators with more time for writing, played a crucial role in ensuring the accessibility of OER in the study.

2.2.5. *Literature review related to Demographic variables affecting OER adoption*

Alkhasawneh (2020) explored the perception of academic staff at Saudi Universities on the barriers, incentives, and benefits of the OER network. The findings indicated that there was no significant association between gender and academic staff perceptions of the use of OER, but there was a correlation between academic position and academic staff perceptions of the use of OER. Similarly, the main purpose of the study conducted by Stines (2020) was to determine if there were any significant statistical differences between teachers' years of teaching experience and cyber discipline focus area and their awareness, perceived effectiveness, and potential barriers to using OER in course instruction. The study found no statistically significant differences in the perceptions of OER based on the number of years of teaching experience and the number of NICE roles chosen by faculty. Peregrino, Caballes, and

Javillonar (2020) aimed to investigate the correlation between teachers' demographic characteristics, such as gender, age, years of teaching experience, and educational attainment. The research revealed an insignificant association between the participants' gender, age, and years of teaching experience. In addition to this, the study showed a moderate positive correlation between the educational attainment of the respondents and their level of awareness regarding OER. The findings of Jung and Lee (2019) also showed that age and experience have no impact on university educators' intentions to use OER in different cultural contexts. Kassab and Altawalbeh (2023) revealed that there are no statistically significant differences in the level of awareness among faculty members based on gender. Furthermore, the research findings indicate a significant correlation between the years of experience and the level of awareness among faculty members on the use of OER. In contrast to these studies, the result of Elder, Larson, Thornton, and Cross (2020) revealed that the highest level of engagement with OER was found to be among the associate professors. Al-Zahrani (2023) also demonstrated that gender, ease of OER, workload, teaching experience and teaching style have a significant effect on faculty members' engagement with OER practices.

2.2.6. *Literature review related to perceived benefits of OER in teaching-learning process and professional development*

Literature studies by Jhangiani et al. (2016); Ozdemir and Bonk (2017) unveiled that incorporating OER into teaching practice improved both students' learning and their effectiveness as educators. Teachers were motivated to implement strategies for providing differentiated instruction. In addition to saving time and money for educators, participants found that OER helped them to reach their classroom goals more effectively (Kwak, 2017). Haas, Ebner, and Schon (2018) found that educators can greatly benefit from taking advantage of OER to raise both student engagement and satisfaction with their classroom experiences. Fulgencio (2018) remarked that the freedom to use OER and cost-effectiveness for students were seen as benefits of OER. According to Prisco (2016), faculty members believe that OERs are beneficial and sustainable focus on enhancing student learning and success and are efficient in terms of cost. The outcome of the study of Bliss, Robinson, Hilton and Wiley (2013) showed that teachers reported significant cost savings as well as diverse pedagogical and

learning benefits as a result of using OER in the classroom. Lin (2019) demonstrated that using OER is beneficial to students because it lowers the cost of textbooks, provides access to dynamic and plentiful OER materials, enables mobile learning, and fosters the development of self-directed skills and copyright guidelines. Also, teachers perceived OER as increasing classroom flexibility and student engagement when combined with technology (Forgette, 2020). According to the result of Karipi (2020), the perceived potential benefits of utilizing OER were that it would lessen their workload and make their work more effective and more flexible, provide students with cost-efficient resources and broaden students' knowledge and increase the reputation of the institution.

Furthermore, teachers felt that the quality of OER is at least comparable to that of the conventional textbooks they had used in the past. Similarly, Zhang and Li (2017); Bond, Huddleston and Sapp (2021); Stoupenos (2021); Lantrip and Ray (2020) indicated that OER and conventional textbooks were on roughly the same level of intellectual depth and quality when compared one another. Kimmons (2015) also discovered that K-12 teachers considered both open textbooks and open/adapted textbooks to be superior to their copyright-restricted alternatives. It was concluded that the adaptability, remixability, and modifiability of these resources enhance the potential value for teachers in effectively addressing specific contextual demands. Martin (2018) presented that some of the departments have review committees to evaluate textbook use in the case of undergraduate general education. Al-Zahrani (2023) discovered that faculty members acknowledge the benefits of OER in terms of relevant content and trusted quality, extensive use, accessibility across multiple disciplines, a wide array of materials, cost-efficiency, compatibility with LMS platforms, alignment with desired educational objectives, and user-friendly nature. Zimmermann, Mayweg-Paus, Ruwe, and Maine (2023) measured teachers' perceptions of the quality of OER in terms of application, content, design, value, and sustainability. The study also examined the additional aspects that teachers consider relevant when evaluating the quality of OER. The results showed that the teachers expressed a high level of satisfaction with all of the DIALLS OER. The teachers found that the design and application of the materials were successfully developed as stand-alone resources, enabling them to use them in a self-regulated manner. Moreover, teachers also highlighted the adaptability of the materials and the opportunity to reflect

on teaching practices as important aspects of quality evaluation. Odusanya (2018) declared that OER has the potential to offer high-quality educational materials for teaching and learning. Furthermore, the integration of OER in distance learning education would improve access to valuable knowledge repositories and also contribute to the expansion of access to higher education and training in a cost-effective way. The study recommended that to make OER a success, there is a need to integrate OER with learning management system software, recognise and incentivise faculty who create OER, and conduct training programmes on copyright and OER. Kugamoorthy and Rajini (2017) explored the perspectives of educators in Northern Sri Lanka who have incorporated OER into their pedagogical practice through the application of ICT. The results indicated that after incorporating ICT and OER into their pedagogical strategy, students' horizons broadened and their understanding improved. They believe that using both ICT and OER helps them to provide more effective instruction, collaborate more effectively with colleagues, and share more effective lesson plans and resources. The results also showed that educators' interpersonal behaviours changed dramatically after incorporating OER in terms of information sharing, innovation, creativity, and the development of their personalities, leadership abilities, and team spirit. ICT-OER integration improved educators' social skills and connections. Lantrip and Ray (2020) agreed that the implementation of OER resulted in beneficial outcomes for the students, including cost savings, increased access to higher education, and enhanced participation. In addition to this, the use of OER has made them more effective teachers and has shifted the roles of students and teachers within the classroom. Katz and Brandle (2022) undertook research to gain insights into faculty members' experiences with adopting OER. Despite lacking strong departmental support and feeling disconnected from the OER community, faculty members reported increased professional satisfaction in teaching with these materials. Karunanayaka and Naidu (2017) indicated that the integration of OER had a significant impact on how teachers changed their usage of instructional resources as well as their pedagogical perspectives and practices. After the OER intervention, teachers' pedagogical perspectives and practices evolved towards more constructivist, context-centric, and collaborative patterns, as well as a participatory and sharing culture, in favour of Open Educational Practices. In addition, Pina and Moran (2018) stated that faculty members and instructional designers figured out that the

implementation of OER resulted in higher-quality courses as well as a higher-quality working relationship among the individuals who were responsible for developing the courses. Nascimbeni, Burgos, Spina and Simonette (2020) examined the relationship between universities' international collaboration and the utilization of OER to demonstrate that the use of open educational content can positively influence the development of universities' international partnerships. The result concluded that the use of OER has the potential to have a positive impact on the international collaboration practices of universities and, as a result, on the internationalization dynamics of such institutions. Findings revealed that six different forms of international collaborations can help to promote the use of OER, these include the contextualization and adaptation of OER, the sharing of knowledge on open education, collaboration through Massive Open Online Courses (MOOC) platforms, virtual mobility schemes, the development of collaborative open courses, and the collaborative accreditation of non-formal learning. Moreover, Jongsermtrakoon and Nasongkhla (2015) evaluated the impact of group investigation learning systems for OER on the digital literacy or information ethics of student teachers. The findings indicated that the group investigation learning system on OER affects the level of digital literacy and awareness of information ethical abilities possessed by the student teacher. Sandanayake (2019) intended to undertake action research on promoting OER-based learning among undergraduate students using a blended learning strategy. The study concluded that this model can increase the quality of education at the undergraduate level and has the potential to become a long-term sustainable solution. Pulker (2019) carried out a study on the practices of teachers through the adoption of OER for online language teaching. It was discovered that reusing OER encourages self-reflection and has the potential to play a significant role in the growth of teachers as online educators. The reuse of OER helps teachers improve their technical online skills, but it does so without requiring them to alter their online teaching strategies or their core beliefs. Craig (2020) revealed that the adaptation and integration of OER has the potential to positively impact best practices, connectivity, learning outcomes, and financial concerns. McGreal (2017) declared that OER has the potential to make a significant contribution to the attainment of the SDG (Goal 4), which is to ensure that all children receive an education of sufficient quality. Even people who are living in unfavourable conditions have the potential to have access to knowledge and learning

with the assistance of OER, which can even solve issues of cost, quality, and equity. OERs are increasingly becoming part of areas of education, including adult education, vocational education, and literacy instruction. It was further noted that OER has the potential to be a substantial aid in ensuring that all students receive a quality education that is inclusive and equitable and that it has the potential to foster lifelong learning opportunities for everyone. Karunanayaka and Naidu (2018) had the intention of designing learning experiences that were efficient, effective, and engaging in a continuous professional development programme utilizing a Scenario-based learning method to facilitate the integration of OER by practitioners. This OER integration capacity-building programme has resulted in major improvements in the pedagogical attitudes and practices of educators, as well as in their confidence, sense of satisfaction, and sense of achievement. Concerning the facilitators, the result of Zeichner (2020) demonstrates that teachers hold the belief that OER ought to possess attributes such as traceability, alignment with curriculum, ease of modification and customization, current and up-to-date, user-friendly interfaces. To promote the chances of a successful implementation, it is important to reinforce teachers' pedagogical autonomy when planning the OER. Shemy and Al-Habsi (2021) researched to investigate the impact that the OER training programme had on the professional development of teachers in the AL-Dakhlia Governorate. Additionally, the attitudes of the teachers about it were also explored. Results showed that the OER training programme has a key role in terms of the professional development of instructors, particularly in terms of improving their teaching knowledge and abilities. The participants have a favourable outlook towards the impact that the training programme will have on their overall professional development. The research concluded that OER environments are rich in knowledge and cooperative activities. These OER platforms inspire teachers to continue their professional development and engage in lifelong self-learning throughout their careers. Karataş, Yılmaz, Karataş, and Banyard (2022) established that academics displayed both the intention and utilization of OER as a means to enhance their professional development. Moreover, the utilization of educational electronic resources has the potential to enhance professional growth, irrespective of geographical location or educational level.

2.2.7. *Literature review related to challenges towards OER adoption*

Rolfe (2012); Percy and Belle (2012); Chen and Panda (2013) Mwangi (2018) highlighted that confusion over copyright, search for relevant OER and a lack of technological support slowed down the adoption of OER. However, Hussain, Chandio and Khan Sindher (2013) mentioned several technology-related issues such as internet speeds, power outages, bugs and computer viruses; finger joint pains, backache, headache, and computer vision syndrome which teachers faced when using OER in higher education. Okwu, Ogunbodede, and Suleiman (2023) stated limited access to electricity and the internet, as well as a lack of awareness, library sensitization, and ICT skills, were all significant barriers to the effective use of OER. Another significant problem is teachers are completely ignorant about the licensing mechanisms of OER and the amount of time needed to search for, select, modify, and apply OER (Ozdemir and Bonk, 2017). Similarly, Nkwenti and Abeywardena (2019) identified difficulties in locating appropriate OER, a lack of computer skills to search for OER, a lack of ability to adapt to various OERs, and a lack of skills to interpret different OER licenses. According to Cote (2017) and Mwangi (2018), Forgette (2020), there is a lack of awareness on the part of faculty members about their familiarity with OER, the lack of a comprehensive catalogue of resources, the limited number of subject-specific resources, and a lack of awareness regarding permits to use or alter content, lack of time to search for OER, uncertainty regarding the quality of the contents, and unease with the concept of replacing textbooks with online materials were the obstacles that prevented the widespread adoption of OER.

Henderson and Ostashewski (2018) examined the perceptions of faculty members regarding the barriers associated with OER. According to the findings of this research, some of the barriers that hinder the development of OER are institutional policy, a lack of incentives, and the requirement for additional support and education in the areas of creating, utilizing, and sharing instructional materials. Pande, Singh, Intaratat and Mythili (2019); Wright (2018); Moore and Reinsfelder (2020) remarked that there is still a cause for concern over the authenticity and quality of the content. Ehlers, Dauksiene, Sadauskas and Tereseviciene, (2019) researched the skills of university teachers and their perspectives on the creation and use of OER. The findings of the survey depicted that university faculty members are uncertain as to whether or not they possess the abilities necessary for OER development. Buluma (2013) and Alkhasawneh (2020) indicated that lack of knowledge of its existence and poor

administration of the universities, lack of technical equipment and technical support were some of the primary obstacles that prevented academic personnel from using OER. It was further expressed that there is a pressing requirement to increase the use of OER and remove any obstacles that prevent its application. Elder, Larson, Thornton, and Cross (2020) viewed time limits, locating a complete set of resources, and finding relevant resources that correspond with course content as what hinders OER adoption. Students' preferences for using hardcopy texts, faculty members' worries about the quality of free resources, and faculty members' reliance on supplementary resources provided by traditional publishers are some of the barriers that inhibit teachers from adopting OERs according to Fischer, et al. (2020).

Karipi (2020); Rambow (2020); Symmons (2021); Assaf, Nehmeh, and Antoun (2022); Torto (2019); Freeman, Tang, and Geary (2022) found lack of institutional regulations, awareness, time, skills, technology, and managerial support, lack of availability, perceived poor quality of OER textbooks and credibility, absence of physical copies and instructor supplements, absence of funding difficulties using press books to modify and/or create OER textbooks, even though the educators appeared to have good technology skills, copyright issues, and technological limitations, concerns regarding ancillary assignment platforms, and concerns regarding the cultural aspects of the subject are some of the disadvantages that academic staff members face with OER. The findings of Karipi, Mawela, and Van-Wyk (2022) indicate that faculty members at ODL institutions in Namibia have a limited level of professional competency in using OER as a pedagogical approach. Al-Zahrani (2023) discovered the deterrents were the lack of institutional support, lack of a comprehensive catalogue of OER, insufficient availability of resources for their subject area, difficulty in finding the required materials, difficulty in changing or editing OER materials, and uncertainty about permissions to use or modify the resources.

Richter and Ehlers (2011) stated that the teachers showed a lack of understanding of the legal background of OER. Regarding barriers, insecurity on the correctness of information was one of the biggest issues and also a concern regarding the lack of expertise and guidance during the adaption processes. Abeywardena, Dhanarajan and Chan (2012) found that the inability to locate desirable OER and lack of awareness of OER repositories has become a major barrier to the wider adoption of OER for

teaching in Asia. Mtebe and Raisamo (2014) tried to ascertain the perceived barriers to the use of OER in higher education in Tanzania. It was discovered that lack of access to computers and the internet, poor internet bandwidth, a lack of institutional policies, insufficient time to find appropriate materials, a lack of awareness of copyright and IPR issues, a lack of trust in other people's resources, and a lack of interest and expertise in creating or using OER are the main barriers to the use of OER in HEIs in Tanzania. Allen and Seaman (2014) identified the major impediment to the wider adoption of OER as a lack of time and effort to find and evaluate relevant and appropriate OER. The study concluded that the implementation of OER is mostly decided upon by faculty members.

There were considerable impediments for faculty members to use and develop OER, such as a lack of time and abilities, lack of knowledge about open licenses, lack of institutional support and follow-up training, concern regarding OER relevance, reliability, and adaptation as well as a lack of incentives, content, experience, and school-related issues (Yuqing Guo et al., 2015; Kandiero (2015). Chae and Jenkins (2015) discovered that faculty members' efforts to implement OER are hampered by a lack of time to customize materials, an unsupportive departmental or college environment, a lack of technology and skills, feelings of uncertainty about the accuracy and completeness of the content, difficulty in finding OER for their disciplines that meet their demands. Hassall and Lewis's (2017) results highlighted three primary obstacles to the utilization of OER: a lack of awareness of OERs, a lack of motivation to utilize OERs, and a lack of training in the utilization of OER. While, Cox and Trotter (2017a) in their studies revealed teachers admitted that they had never used OER due to a lack of familiarity with the concept, lack of motivation, pedagogical obstacles, lack of relevance, lack of institutional support, lack of capacity, legal clarity, or copyright concerns. Pete et al. (2018) claimed there is low awareness and appreciation of the OER concept and open licensing. According to Orwenjo and Erastus (2018), some of the obstacles that have been encountered in the process of implementing and making use of OER in Kenyan schools include a lack of administrative support, inadequate infrastructure, negative attitudes, a lack of awareness of OER and ICT competencies and other skill gaps. Fulgencio (2018) commented that several obstacles and opportunities arise in educational institutions as they endeavour to develop and maintain OER initiatives such as a lack of OER

sustainability and a lack of consensus on how to implement and sustain OER. Al-Abri and Dabbagh (2018) conducted a literature analysis and found that the adoption of OER has indeed faced several challenges, one of which is the difficulty in locating the appropriate OER materials, and another is the presence of quality control issues with resources. Nobes and Harris (2019) discovered that the researchers lacked an understanding of the commercial clause that is included in CC licenses. Peneder and Walcher (2020) believed that the implementation of OER projects is still at an early adoption stage, especially in developing countries due to infrastructure, internet connectivity, ICT literacy, funding issues, as well as institutional issues like a lack of awareness of OER repository awareness, policies, and training for producing OER resources with open licensing that particularly affect developing countries.

However, restrictions imposed by some OER sources and teachers' lack of competence in utilizing OER would become obstacles to the adoption of OER (Tang, Lin and Qian, 2020). According to the findings of Admiraal (2021), the most significant difficulties include scarcity of relevant and good quality up-to-date resources, problems with managing their time, and challenges concerning their work context, such as acceptance at work, connecting with colleagues and institutional support. Tlili, Ofosu and Zhang (2021) reported searching for OER was a time-consuming process and it raises concerns about intellectual property. Carson (2020) aimed to identify the barriers encountered by faculty members while integrating OER into their instructional practices. The study identified several barriers, including the absence or unavailability of appropriate resources aligned with the requirements of their courses, time constraints, inadequate support in locating OER, no professional development opportunity relating to OER, and a general lack of awareness regarding the nature and scope of OER. Zeichner (2020) investigated the factors that impede teachers in their usage of OER. Regarding the factors that impede the use of OER, teachers identify three primary factors: accessibility, pedagogical quality, and technical challenges. According to Ochieng and Gyasi (2021), the economic, technical, legal, social, and infrastructural needs are the primary difficulties that stand in the way of OERs and concludes that there is a need for attitudinal change towards OERs among students, academics, and scholars among other stakeholders if its optimum uptake is to be realized.

2.3. Studies conducted at National Level

2.3.1. *Literature review related to Attitude and perception about OER*

Mishra and Singh (2017) investigated educators' attitudes toward OER in the context of teaching and learning and found that educators have a positive attitude toward OER creation and sharing. Kiran (2017); Mukhopadhyay, Chander and Kumar (2018); Behera, Kanth, Chowdary, and Kakarwada (2021); Singla, Singh, and Sharma (2022) revealed that the teachers had a positive attitude towards the use of OER. According to responses from teachers, there is a significant demand for OER for both their academic and professional growth. Similarly, Panda and Santosh (2017) also indicated that the faculty members displayed a favourable attitude towards the sharing of knowledge and learning resources. They expressed the belief that these resources should be accessible to all individuals without any financial burden. Santosh (2017) indicated that while most institutions were open to adopting OERs, many struggled with how to put them into practice.

2.3.2. *Literature review related to awareness about OER and CC Licences*

Panda and Santosh (2017) aimed to investigate the perception of openness in education, as well as the attitudes and willingness of faculty members at the National Open University in India towards sharing knowledge and learning resources. The findings highlight the importance of proper training, specifically focused on copyright, IPR, and OER, to effectively create and use OER. Merely half of the participants demonstrated knowledge regarding the various licencing alternatives that facilitate the use of preexisting resources. The findings revealed that a significant proportion of faculty members acknowledged the benefits of knowledge sharing and the use of learning resources in their research and teaching activities. According to the findings of the survey carried out by Padhi (2018), university professors are well acquainted with the idea of OER, but they are hesitant to use OER in their classrooms since they are unsure how it will benefit students. However, due to their training, Mukhopadhyay, Chander and Kumar (2018) found that teachers were well-versed in OER and its benefits. Jain (2019) found that teachers at Madras University have a good understanding of the idea of OERs. Bansal and Joshi (2016) carried out research on teacher educators to investigate the level of awareness regarding OER. The findings of the study showed that there is a lack of awareness about OER among teacher

educators. Furthermore, Santosh (2017) also revealed there was a high level of OER awareness among the faculty in ODL institutions. Midha and Kumar's (2022) study provided evidence indicating that the academic community within the central universities of North India has a strong awareness of OER.

2.3.3. *Literature review related to adoption of OER*

Venkaiah (2008) showed that OERs are widely utilized by distance educators. The distance education community and institutions make use of OERs, and the latter also contribute moderately towards their development. The study, however, concludes that when compared to developed nations, India lags far behind in terms of both OER creation and adoption. Panda and Santosh (2017) indicated that textual materials were the predominant form of learning resources that were created, along with videos, images, and tutorials. Padhi (2018) discovered that the teachers have not utilized OER in their teaching but are willing to share their courses with others in the form of OER. Jain (2019) confirmed that OERs are used as supplementary resources in their classrooms. Munisamy and Sivaraman (2017) discovered that faculty used OER for teaching and learning in general, and they supported the idea that OER improves the teaching and learning abilities of the faculties. OERs were utilized mostly for academic and research-related objectives by the faculty. Kumar and Singh's (2019) results showed that most of the participants are familiar with OER and are making use of it in their respective fields of study. Singla, Singh, and Sharma (2022) conducted a study to investigate the usage of OER among faculty members at Kurukshetra University (KU). The results of the study indicated that faculty members at KU possess knowledge regarding online resources and are familiar with OER. The majority of faculty members utilized online resources in the process of writing research papers. Midha and Kumar (2022) found that the predominant user behaviour for OERs is to utilise them in their original form and just when necessary. E-PG PathShala is widely recognised as the most popular and extensively used OER, with NPTEL and YouTube being the subsequent platforms of choice. Many faculty members use OERs as a means to acquire novel ideas and inspiration, hence enhancing their professional competence. Gangathulasi, Shanmuganeethi Velu, Malliga, and Dinesh Kumar (2023) conducted a study to evaluate the utilisation of OER both during and after the pandemic. The study's findings indicate that there was an increase in

awareness and adoption of OER following the pandemic. However, even after the pandemic, the senior faculty members remained unaware of and did not embrace the use of OER. The majority of the faculty were already aware of OER before the pandemic, but they had not effectively utilised it. National OER was preferred over international OER due to its relevance and adaptability. The international OER is used to upgrade content and see it holistically.

2.3.4. *Literature review related to factors facilitating OER adoption*

Social and altruistic factors, improved learning, collaboration, cost and time savings, increased access to resources, personal benefits, increased self-confidence, and technological expertise and knowledge about licenses were found to be the most influential factors in educators' decisions to use and share OER (Mishra and Singh, 2017). The findings of Panda and Santosh (2017) highlighted the importance of proper training, specifically focused on copyright, IPR, and OER, to effectively create and use OER. According to the study of Gangathulasi, Shanmuganeethi Velu, Malliga, and Dinesh Kumar (2023), OER quality can be assessed based on author reputation, region-specific relevance, content structure, learning content, assessment, and reviewers' profiles. Menon and Bhandigadi (2018) sought to investigate and analyze the procedures and factors involved in incorporating OER into the creation of new instructional materials. The research showed that reusing OER is a complex process since several competencies affect it adversely. Researchers found that OER integration was most successful when course designers had a firm grasp on subject matter and pedagogy, as well as an understanding of the learning environment, along with awareness of OER concepts, capacity for reusing OERs, language and writing skills in addition to IT skills. Furthermore, course designers have found that reusing OER for course development takes time; but, with proper training and experience, the OER integration process has the potential to be more quality, cost, and time-efficient.

2.3.5. *Literature review related to demographic variables affecting OER adoption*

Behera, Kanth, Chowdary, and Kakarwada (2021) investigated the attitudes of secondary school teachers towards OER, taking into consideration their gender and stream of study. The survey revealed that there was no statistically significant difference in the attitude of OER among secondary school teachers

based on gender and stream of study. Karalmarx and Lakshmi (2021) sought to analyze the relationship between the knowledge of OER and the experience of engineering faculty members. It has been discovered there is a substantial relationship between the years of teaching experience of faculty members and the level of their knowledge regarding OER.

2.3.6. *Literature review related to benefits of OER in teaching-learning process and professional development*

Panda and Santosh (2017) aimed to investigate the perception of openness in education, as well as the attitudes and willingness of faculty members at the National Open University in India towards sharing knowledge and learning resources. The findings highlight the importance of proper training, specifically focused on copyright, IPR, and OER, to effectively create and use OER. Merely half of the participants demonstrated knowledge regarding the various licencing alternatives that facilitate the use of preexisting resources. The findings revealed that a significant proportion of faculty members acknowledged the benefits of knowledge sharing and the use of learning resources in their research and teaching activities. Santosh (2017) addressed the belief in the sharing and reusing of educational materials; OER beneficial to students' academic growth, a willingness to participate in online communities and better opportunities for collaboration with peers and teachers; an interest in using the latest technology for knowledge expansion, and a self-driven interest in OER motivated teachers to adopt OER. Pande (2018) carried out a case study at Uttarakhand Open University to investigate the opportunities and problems related to the adoption of OER for course development. This research found that using OERs to develop course material is more efficient in terms of time, cost, and effort. The study also revealed that the adoption of OER practices in the development of the self-learning material of the course has a positive impact on the quality too. When compared to traditional course development, the OER approach results in a cost savings of 91.69% and a time reduction of 87.27%. It was concluded that OERs can play a potential role in teaching students with individual differences and facilitate personalized learning. Joshith (2020) carried out a study with the goals of developing OER and designing MOOCs to enhance the professional development of secondary teachers; designing and analyzing the effectiveness of e-learning courseware

developed with OER and MOOCs for professional development of secondary teachers; and finally, conducting training programmes for the professional development of secondary teachers through the developed e-Learning Courseware. According to the findings of the research study, secondary school teachers' professional growth can be aided by appropriate engagement with OER. It was pointed out by Kumar, Baishya, and Deka (2021) that teachers have the notion that the most significant benefit of this practice is the enhancement of both their personal and institutional reputations through the publication of OER. Dutta (2013) tried to emphasise the significance of OERs as a notable medium that has the potential to improve the efficiency and responsiveness of teacher education to meet the requirements of teachers (both pre-service and in-service). The use of OER makes it possible for a wide variety of high-quality instructional materials to be made accessible to everyone at a cost that is comparatively low. OER also facilitates the sharing of problems and experiences between student-teachers and practitioners, which, in turn, assists teachers in evolving into reflective practitioners. Mushtaq, Ali, and Bhat (2017) in their review paper claimed that OER has made a significant contribution to the diverse supply of learning resources that are available to the worldwide community of students. The OER initiative has the goal of making a wide variety of educational resources available on the Internet at no cost to users. In India, where a number of national institutions have developed OER portals to offer access to their educational resources on a statewide scale, there has been a recent trend of incremental expansion. It is essential to keep in mind that providing equal access to technology is required to guarantee that individuals will have the same opportunities to utilize open resources. Ashalatha and Joshith (2019) in their literature review argued that the development and distribution of OER can facilitate the expansion of networking opportunities between students, professors, and subject matter experts. It ultimately contributes to the growth and development of educators as professionals. This method of OER, which is both cost-effective and time-saving, improves the quality of education and the environment in which students learn as a result of its open licenses, open sharing of knowledge, saving time and effort to collect resources, and the development of competency in the production of resources that meet quality parameters. Mahendraprabu, Kumar, Mani and Kumar (2021) stressed in their article the significance of OER in the twenty-first century. At the moment, OER is used extensively in the context of making resources

available at any time, in any place, and to any individual. OER supports and advocates the idea that education should be free. Students gain self-assurance and the freedom to learn at their own pace because of the wide availability of OERs.

2.3.7. *Literature review related to challenges towards OER adoption*

In the research conducted by Mishra and Singh (2017), some educators were found to be a little bit concerned about the credibility of OERs. Challenges identified were a lack of understanding of intellectual property, copyright and open licensing; pedagogical issues; lack of time, lack of funding and technological support. The study conducted by Kiran (2017) revealed that teachers' use of OER is limited because of a lack of clarity regarding OER, a lack of awareness regarding various OER search engines, and a lack of understanding regarding open licenses and Creative Commons licenses, a lack of an institutional repository and no incentives to acknowledge faculty members' contribution to OER. It was revealed by Padhi (2018) that teachers faced a number of obstacles, some of which included a lack of a conducive environment, positive social influence, and the absence of appropriate policy recommendations. According to the findings of Jain (2019), even while teachers indicated their support for OERs in higher education, they still faced challenges regarding the quality and licensing difficulties associated with the development of OERs. Bansal and Joshi (2016) concluded in the study that lacks of knowledge about finding and using OER, lack of time and poor technical infrastructure were some of the barriers to the success of OER. As per the result of Santosh (2017), teachers responded lack of training on OER use, poor internet and connectivity, lack of OER in the native language, absence of institutional policies to support OER creation and use, and difficulties in finding relevant OER to the study area as obstacles in OER adoption. Further, Munisamy and Sivaraman (2017) declared that the use of OER was plagued with several significant challenges, the most significant of which included the internet's slow speed, the absence of user manuals, the absence of up-to-date information, the lack of subject coverage, and the apparent lack of user-friendliness. Kumar, Baishya & Deka (2021) carried out a study on the issues and problems experienced by OER by social scientists of selected higher educational institutions in India. The result showed inadequate knowledge, unfamiliarity with the university's OER repository and other repositories, and a dearth of user feedback as the main obstacles to OER publication.

2.4. Research Gap

The above literature review discussed the adoption of OER in the higher education sector. Over the course of the past few decades, OER has emerged as a new field of research all around the world, paving the way for promising new avenues of inquiry. Although there are a great number of studies on the subject of OER adoption in developed countries, each of which focuses on a different facet of the phenomenon.

OER has the possibility of improving teaching and learning in many ways within the realm of conventional higher education, including an improvement in students' academic performance; more equitable access to educational resources; financial benefits for students; and enrichment of individual and institutional reputation across the globe (Rolfe, 2012; Kugamoorthy and Rajini, 2017; Henderson and Ostashewski, 2018; Pina and Moran, 2018; Sandanayake, 2019; Pulkar, 2019; Dragicevic, Pavlidou, and Tsui, 2020; Craig, 2020; Lantrip and Ray, 2020; Demsey, 2021). Past research has also acknowledged that OER promised to have a positive impact on the pedagogical practices as well as the critical reflection of teachers (Karunanayaka and Naidu, 2017; Nascimbeni, Burgos, Spina and Simonette, 2020; Shemy and Habsi, 2021). These earlier research investigations demonstrated that OER will give rise to the possibility of international collaboration leading to the production of high-quality resources. In the opinion of McGreal (2017), OER tends to make a significant contribution towards the achievement of Goal 4 of the Sustainable Development Goals, which is to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all".

Teachers in higher education have a positive outlook on the adoption of OER and are eager to contribute to the OER movement, as shown by the reviewed studies of Percy and Belle (2012); Rolfe (2012); Hussain, Chandio and Khan Sindher (2013); Kursun, Cagiltay and Can (2014); Ganapathy, Chee Pei Wei, Vighnarajah and Jong (2015); Sambo, Utin and Udo (2016); Pande, Singh, Intaratat and Mythili (2019); Nkwenti and Abeywardena (2019); Alkasawneh (2020) and Karipi (2020).

Earlier works of literature have shed light on the current state of OER in higher education and disclosed that the rate of adoption varies greatly between developed and developing countries. However, very recently, Peneder and Walcher (2020) claimed

that the implementation and adoption of OER are still in the early adoption stage, particularly in developing countries. The thorough view of the relevant literature reveals that the majority of the research has been carried out in countries other than India. It is discovered that studies on OER adoption are still relatively new to the field of study in the context of India (Venkaiah, 2008; Bansal, Chabra, and Joshi, 2013; Padhi, 2018). According to the review of the relevant literature, only a small number of empirical studies have been carried out in India on the subject of the adoption of OER, and more specifically, there has been no research carried out that focuses specifically on the Central Universities of North-East India.

Previous studies have been carried out in a variety of educational settings, including distance education institutions (Venkaiah, 2008; Santosh, 2017), universities (Bansal and Joshi, 2016; Kiran, 2017; Padhi, 2018; Jain, 2019; Kumar and Singh, 2019; Kumar, Baishya and Deka, 2021), open universities (Mukhopadhyay, Chander and Kumar, 2018; Pande, 2018), with college teachers (Munisamy and Sivaraman, 2017) and with secondary level school teachers (Joshith, 2020).

Yet, it is also discovered that previous research in India has mostly concentrated its attention on educators from the fields of engineering education, arts and science, and in general. (Munisamy and Sivaraman, 2017; Karalmarx and Lakshmi, 2021). Until now, there have been very few studies that concentrate on teachers from social science backgrounds (Kumar, Baishya and Deka, 2021). Concerning the faculty of Humanities and Social Sciences, there is a paucity of research available. In addition, the literature research revealed that the influence of demographic variables including gender, years of teaching experience and designation on faculty members' attitudes toward OER adoption has not been thoroughly explored.

One more significant gap in the OER research study is the lack of an OER adoption pyramid. The factors that influence OER adoption in India have been the focus of a smaller number of studies than in other countries. This study employed the OER adoption paradigm proposed by Cox and Trotter (2017b) so that it could investigate the factors that influence the adoption of OER in higher education institutions.

The literature analysis also revealed the paucity of standardized instruments available to gauge teachers' attitudes toward the adoption of OER. Mishra's (2017b)

standardized ATOER (Attitude Towards Open Educational Resources) scale is the only one that has been acknowledged so far in India. This scale has 17 items that fall under two different dimensions: sharing and adaptation. As a result, one of the goals that we want to accomplish with this study is to create a valid and reliable scale that can be used in future studies to measure the attitudes that teachers have about the adoption of OER.

The above-mentioned empirical literature also demonstrated the understanding, attitude and practices of the CC licenses. Fitzgerald (2007) and Kapitzke, Dezuanni, and Iyer (2011) found that creative commons is the right approach to sharing and reusing dormant copyright works. The culture of OER in the academic community has been profoundly impacted due to Creative Commons. Furthermore, prior research also discovered a dearth of extensive international studies into CC licenses. Moreover, prior academics in India have not emphasized this facet of OER in their studies. Hence, it is still unknown whether or not the faculty members were familiar with the CC license, and if so, how they view and make use of such a license. This present research is conducted to fill this void in the argument. In addition, a limited number of empirical survey results have been obtained so far in the context of the 5R's of OER.

How OER is perceived by teachers is the foundation that underpins the success of OER. It is crucial that their perspective, awareness, usage of OER, perceived effectiveness as well as the obstacles faced with OER adoption, be taken into consideration. Nevertheless, none of the current research is all-encompassing enough to incorporate the viewpoints of both OER users and OER creators. Therefore, this study made an effort to narrow that gap by considering OER creators' and users' perspectives. Hence, to optimize the effectiveness of OER adoption in higher education institutions, it is essential to carry out comprehensive research on OER adoption.

In light of all of these gaps, the adoption of OER in higher education institutions in India is not yet fully understood. If this is the case, the limitations that have been found need to be addressed; otherwise, successful adoption and long-term sustainability of OER will not be achievable. The literature study serves as the foundation of this thesis, which attempts to answer the problems that were raised earlier but were not resolved.

The following inferences can be drawn based on the limited review of the relevant literature and the identified research gaps:

1. A significant number of the studies were carried out in other countries, with only a few being carried out in an Indian context, and no research being discovered in North-East India.

2. In India, research has been carried out with teachers from the Open University, the state university, institutions of distance education and training, and colleges and schools. Because there is a gap in the research, the researcher decided to focus on studying the adoption of OER among faculty members at central universities.

3. Only a small number of empirical investigations have been conducted in the academic fields of humanities and social sciences.

4. Previous research did not take into account the influence that demographic variables can have on a person's attitude toward the adoption of OER. So, the purpose of the present study is to investigate the influence of certain variables (gender, years of teaching experience, and designation) on teachers' attitudes towards the adoption of OER.

5. The available evidence suggests that just a few studies on these two aspects, namely the CC License and the 5Rs of OER, have been conducted in India, and more specifically in the region of North-East India.

6. By using the OER pyramid developed by Cox and Trotter (2017b), this study attempted to investigate the factors that contribute to the successful adoption of OER in higher educational institutions.

7. After conducting a survey of the relevant literature, it became clear that there are not many standardized tools available for evaluating teachers' attitudes towards the adoption of OER.

8. This study attempts to provide an answer to another crucial topic by investigating the perception, effectiveness, and challenges associated with the adoption of OER from the perspectives of OER users as well as OER creators. Previous research has failed to address this facet of the problem.
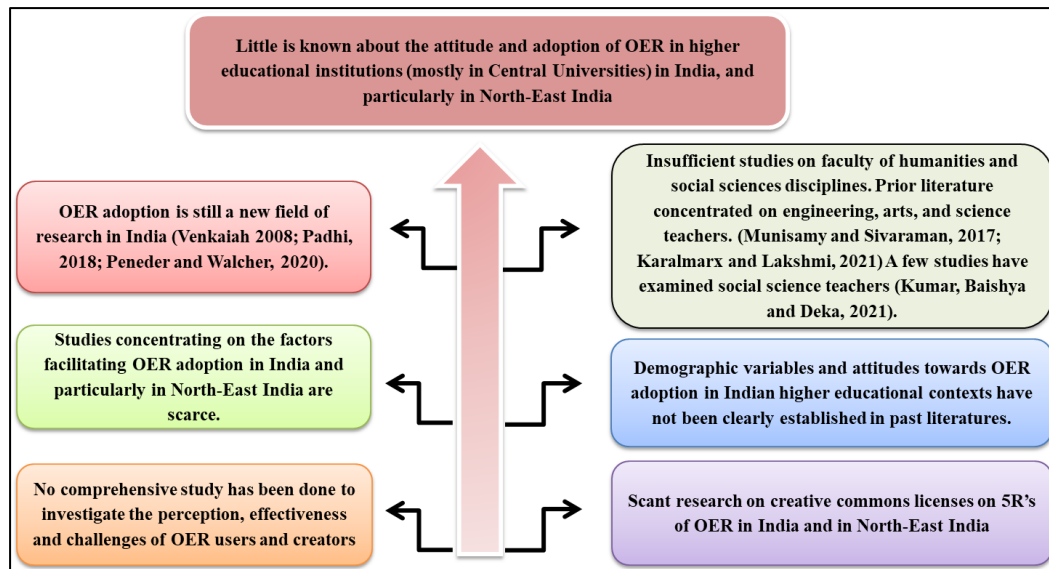
Fig 2.1: Synthesis of the research gap.

A synthesis of the overall research gap and the reasons that the present research tried to address is given in Figure 2.1.