

Course Title: Research Methodology in Computer Science

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Lecturer: Dr. Mohammed Anbar

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Assignment Report:

The Actual Value of Professional Certifications: An Analytical
Comparison of Qualifications, Skills, and Individual Behaviours

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Paper 1: Qualifications and Certificates v Practical Knowledge and Experience: Is There a Winner?

The paper shows the importance of professional certifications in the IT field from the point of view of both employers and employees. Although certificates are used as an effective tool to filter job applicants and enhance their chances of employment, there are questions about the extent to which they actually reflect the skills of their holders. The results show that certificates play a decisive role in the recruitment process, but they are not the only factor on which employers rely, as many prefer to combine certificates with work experience and educational qualifications. The result of paper as below:

First Point: The value of certificates in employment: Employers consider certificates to be a useful indicator of basic skills, but they are sceptical about their ability to accurately measure practical competence. Many employers use certificates as a tool to filter applicants, especially in competitive positions.

Second Point: Challenges: Some certificates do not require work experience, which may lead to individuals obtaining certificates without possessing the necessary practical skills. Rapid changes in technology require constant updating of certificates, which increases the burden on specialists.

Third Point: Recommendations for improvement: Develop certification tests based on practical performance to ensure that the recipients possess the required skills. Encourage educational institutions to integrate certificates into the curriculum with a focus on practical application.

The ways used in paper combined between employer interviews and employee surveys to assess the role of certificates in recruitment and skills measurement. Triangulation methods and statistical tests have enhanced the reliability of the results.

Paper 2: Professional Certification: The Practical Side--To Be or Not to Be

The Paper presents a practical analysis of the importance of professional certificates in the field of philanthropy and grant development, through the experiences of three professionals in different fields. These experiences show that professional certificates enhance credibility and professionalism, open new doors in the Labor market, and also guarantee the quality of services provided to society. In the absence of standard academic certificates in this field, professional certificates become a vital tool for distinguishing professionals and raising their status. The result of paper as below:

First Point: Professional certificates are a sensitive tool to enhance credibility and excellence in areas such as grant development and philanthropy, especially in the absence of standard academic degrees. These certificates give professionals a competitive advantage in the Labor market, and make it easier for them to prove their competence in front of clients and employers.

Second Point: Practical experiments: the professional certificate helped him strengthen his image as a professional consultant, although its direct impact on clients was limited. Professional certifications in sign language translation have transformed the profession from unregulated to a legally binding standard, enhancing the quality of services and the protection of beneficiaries. The ways used in paper Theoretical framework and Case study based on three case studies of professionals with degrees in different fields and Comparative analysis and compares the experiences of the three professionals.

Paper 3: An Empirical Study of Professional License Acquisition: Theory of Planned Behaviour View

The paper aims to analyse the motivation of workers in the manufacturing sector to obtain professional licenses, using the theory of planned behaviour (TPB) as a theoretical framework. The sample included 490 workers in Yunlin County in Taiwan, and the data was analysed using advanced statistical tools such as factor analysis, structural modelling equation (SEM), reliability and validity testing. The result of paper as below:

First Point: Confidence and orientation towards professional certifications: The more confident individuals are in the benefits of certificates, the more they want to get them.

Second Point: Career planning and behavioural control:

Career planning is suitable for individuals who plan their professional future are better able to take practical steps to obtain professional certifications. The ways used in paper Theoretical framework (theory of planned behaviour-TPB) and Research methodology using a field questionnaire and statistical analysis

Paper 4: Credentials, Competencies, and Certification

This paper addresses the issue of Professional Licensing for Youth Service librarians, and highlights challenges and potential solutions to improve current practices. Here are the main points:

- The main problems with the current license: Quality of practitioners: The current licensing process does not produce qualified specialists with the required competencies to perform the roles expected of them. There is an emphasis on academic qualifications (such as a master's degree in library science) without ensuring the necessary practical skills and professional behaviours.
- The causes of these problems: The division between practical environments: Youth Library specialists are separated between schools and public libraries, with different criteria for each environment, which impairs professional integration.
- Career and financial situation: Low salaries and the social status of this profession attract less competent or motivated people.

The result of paper as below:

First Point: Improved standards: Develop clear national standards and free of complex terminology to serve young people in public and school libraries and linking these standards to the licensing process to ensure the quality of practitioners.

Second Point: Enhanced training and accreditation: Review training programs to ensure that they focus on practical competencies (such as communication skills, planning youth programs).

Third Point: Graduated licensing form: Beginner level (university degree with proficiency tests).

Professional level (master + work experience). Expert level (leadership and research abilities). The ways used in paper Critical analysis of reality. Historical approach to understand the roots of the problem.

Applied approach to put forward practical solutions. Foresight to chart a future path.

Paper 5: PROFESSIONAL CERTIFICATIONS VERSUS SKILLS: A STUDY OF PROFESSIONAL CERTIFICATIONS FROM THE PERSPECTIVE OF THE CERTIFIED AND THEIR EMPLOYERS

This paper aims to explore the value and usefulness of professional certificates in the field of information technology (IT) from the point of view of both employers and employees with these certificates. With rapid changes in technology and the economy, certificates have become a popular tool for proving skills, but the extent to which they actually reflect the abilities of their recipients is still unclear. The paper was conducted using a mixed methodology (quantitative and qualitative) that included surveys of employers and IT employees. The data were analysed to determine whether certificates are considered a decisive factor in hiring and retaining jobs, and whether they reflect the actual skills of individuals. The result of paper as below:

First Point: The value of certificates in recruitment: The results showed that certificates play an important role in the recruitment process, as employers use them as a tool to filter candidates. However, not all companies rely on them completely, sometimes they prefer to combine diplomas, work experience and academic qualifications.

Second Point: Reflection of skills: although certificates are considered an indicator of theoretical knowledge, they do not always guarantee practical competence. Some degree holders may lack the applied skills required in the job.

Third Point: Challenges: the study revealed challenges such as the ease of obtaining some certificates without sufficient practical training, in addition to the need to constantly update certificates due to rapid technological developments.

The ways used in paper The Paper combined quantitative approach (questionnaires with closed questions) and qualitative approach (open questions to draw opinions and experiments). Data collection tools: Questionnaires for employers and Questionnaires for employees and Data analysis.

Paper 6: The Role of Professional Certifications in Computer Occupations

This paper aims to explore the role of professional certificates in computing and Information Technology (IT) jobs, focusing on their impact on employment, selection criteria, costs, and value in the US Labor market. With the changes brought about by the covid-19 pandemic in the Labor market and education, professional certificates have become an important tool to enhance skills and improve career opportunities. The result of paper as below:

First Point: Application for certificates in the Labor market: The importance of certificates varies according to different disciplines in the field of computing. For example, information security jobs show a high demand for certificates (such as CISSP and CompTIA Security+), while computer science research jobs show little interest in them.

Second Point: Motivation for obtaining certificates:

For employees: certificates are a way to enhance skills, improve career opportunities, compensate for the lack of experience in new technologies. It is also used as a tool for continuous professional development.

For employers: certificates are used as a benchmark to measure the competence of employees, especially in regulated areas such as cybersecurity, where certificates are required to comply with government regulations.

Thid Point : The value of certificates: The value of the certificate depends on three factors: competence (the skills it represents), suitability (how relevant it is to the job), and recognition (how popular it is in the market).

The ways used in paper Quantitative analysis Using data from The Current Population Survey (CPS) of the US Bureau of Labor Statistics (BLS) to measure the percentage of computing workers with certificates or licenses. Qualitative analysis to discuss the motivation of employees and employers to obtain or request certificates, based on the economic and professional context. Data collection tools such as job listing analysis (EMSI) previous studies and reports

Critical Analysis:

Technology and workforce changes have made us re-evaluate traditional qualifications in favor of more practical skills-based recognition. Professional certifications have become a key tool in this shift, but their value is still debated. This critical analysis looks at 6 research papers that examine the role, perception and effectiveness of professional certifications vs skills and practical experience across IT, education and social services.

Based on the 6 research papers we found that the professional value is to enhance the credibility and professional image of individuals, which doesn't always reflect real practical competence, so it's better to include practical tests within the certificates to ensure skill. It also facilitates the recruitment and hiring process and the initial screening of applicants. Some employers rely too much on certificates and from this point of view employers must be sensitized to the need to combine certificates with experience. Also, professional certificates contribute to professional development, support future career planning and motivate individuals to continuous learning. Some individuals get certificates for formal motivation only without real desire to develop, so it's important to link certificates with training plans and continuous evaluation to ensure real development. The cost is a long-term investment in professional skills and may be expensive and complex in terms of requirements, so it's recommended to diversify the options for professional certificates in the same field and look for the best in terms of financial cost and benefit concerned

Connections:

1. **Methodologies Used:** Using statistical analysis methodologies in addition to questionnaires for employees and employers.
2. **Perspectives:** Most research papers present two points of view, that of employers and that of employees or degree holders.
3. **Practical Skills vs. Certificates:** The research papers discuss the extent to which certificates represent practical skills, compare certificates and work experience, criticize the poor fit between certificates and competencies, and add a behavioural dimension to explaining individuals' decisions.
4. **Practical recommendations:** All papers make practical recommendations, including updating the content of certificates, aligning certificates with market requirements, and integrating certificates into education and professional development programs

Conflicts between the findings:

- 1. Impact of certificates on employability :** Research Paper 2 asserts that professional certificates directly enhance the professional image and open up opportunities in the labour market even in unregulated sectors while research paper 5 suggests that certificates are not sufficient alone for employment, as some employers prefer a combination of certificate, experience and academic degree. The difference here is the different assessment of the importance of certification as a single determinant versus as part of a set of qualifications.
- 2. Individuals' motivations for obtaining certifications:** Paper 3 focuses on the behavioural aspect and personal motivation in obtaining certifications and Paper 6 focuses on professional and economic motivations (improving income, compensating for lack of experience, self-development).The contradiction here is not in the contradiction but in the angle of analysis: The same phenomenon is explained by different theories.
- 3. The extent to which certificates reflect practical skills:** Papers 1 and 5 question the ability of certificates to measure actual practical competence and show that some certificate holders lack practical skills, while papers 2 and 6 provide examples of sectors where certificates have become a recognized standard that guarantees quality of service and professional skill, such as cybersecurity or sign language interpreting. Here, the effectiveness of certificates varies depending on the field, highlighting the need for contextual assessment.

Synthesis Matrix for Literature Review:

Study	Authors	Year	Research Design	Key Findings/Results	Methodology
Qualifications and Certificates v Practical Knowledge and Experience: Is There a Winner?	Eddie Fisher	2020	Experimental	The value of certificates in employment: Employers consider certificates to be a useful indicator of basic skills, but they are sceptical about their ability to accurately measure practical competence. Many employers use certificates as a tool to filter applicants, especially in competitive positions. Some certificates do not require work experience, which may lead to individuals obtaining certificates without possessing the necessary practical skills. Rapid changes in technology require constant updating of certificates, which increases the burden on specialists. Recommendations for improvement: Develop certification tests based on practical performance to ensure that the recipients possess the required skills. Encourage educational institutions to integrate certificates into the curriculum with a focus on practical application	The ways used in paper combined between employer interviews and employee surveys to assess the role of certificates in recruitment and skills measurement. Triangulation methods and statistical tests have enhanced the reliability of the results

Synthesis Matrix for Literature Review:

Study	Authors	Year	Research Design	Key Findings/Results	Methodology
Professional Certification: The Practical Side--To Be or Not to Be	Randal J. Givens	2003	Experimental	Professional certificates are a sensitive tool to enhance credibility and excellence in areas such as grant development and philanthropy, especially in the absence of standard academic degrees. These certificates give professionals a competitive advantage in the Labor market, and make it easier for them to prove their competence in front of clients and employers. Practical experiments: the professional certificate helped him strengthen his image as a professional consultant, although its direct impact on clients was limited. Professional certifications in sign language translation have transformed the profession from unregulated to a legally binding standard, enhancing the quality of services and the protection of beneficiaries.	The ways used in paper Theoretical framework and Case study based on three case studies of professionals with degrees in different fields and Comparative analysis and compares the experiences of the three professionals

Synthesis Matrix for Literature Review:

Study	Authors	Year	Research Design	Key Findings/Results	Methodology
An Empirical Study of Professional License Acquisition: Theory of Planned Behaviour View	I-Jyh Wen, Chien Wei Liang	2021	Experimental	Confidence and orientation towards professional certifications: The more confident individuals are in the benefits of certificates, the more they want to get them. Career planning and behavioural control: Career planning is suitable for individuals who plan their professional future are better able to take practical steps to obtain professional certifications.	The ways used in paper Theoretical framework (theory of planned behaviour-TPB) and Research methodology using a field questionnaire and statistical analysis

Synthesis Matrix for Literature Review:

Study	Authors	Year	Research Design	Key Findings/Results	Methodology
Credentials, Competencies, and Certification	Atkinson, Joan L.	1989	Experimental	Improved standards: Develop clear national standards and free of complex terminology to serve young people in public and school libraries and linking these standards to the licensing process to ensure the quality of practitioners. Enhanced training and accreditation: Review training programs to ensure that they focus on practical competencies (such as communication skills, planning youth programs). Graduated licensing form: Beginner level (university degree with proficiency tests). Professional level (master + work experience). Expert level (leadership and research abilities).	The ways used in paper Critical analysis of reality. Historical approach to understand the roots of the problem. Applied approach to put forward practical solutions. Foresight to chart a future path

Synthesis Matrix for Literature Review:

Study	Authors	Year	Research Design	Key Findings/Results	Methodology
Professional certifications versus skills: A study of professional certifications from the perspective of the certified and their employers	Heise, Joan M	2009	Experimental	The value of certificates in recruitment: The results showed that certificates play an important role in the recruitment process, as employers use them as a tool to filter candidates. However, not all companies rely on them completely, sometimes they prefer to combine diplomas, work experience and academic qualifications. Reflection of skills: although certificates are considered an indicator of theoretical knowledge, they do not always guarantee practical competence. Some degree holders may lack the applied skills required in the job. Challenges: the study revealed challenges such as the ease of obtaining some certificates without sufficient practical training, in addition to the need to constantly update certificates due to rapid technological developments.	The ways used in paper The Paper combined quantitative approach (questionnaires with closed questions) and qualitative approach (open questions to draw opinions and experiments). Data collection tools: Questionnaires for employers and Questionnaires for employees and Data analysis

Synthesis Matrix for Literature Review:

Study	Authors	Year	Research Design	Key Findings/Results	Methodology
The Role of Professional Certifications in Computer Occupations	M Tannian, W Coston	2021	Experimental	Application for certificates in the Labor market: The importance of certificates varies according to different disciplines in the field of computing. For example, information security jobs show a high demand for certificates (such as CISSP and CompTIA Security+), while computer science research jobs show little interest in them. Motivation for obtaining certificates: For employees: certificates are a way to enhance skills, improve career opportunities, compensate for the lack of experience in new technologies. It is also used as a tool for continuous professional development. For employers: certificates are used as a benchmark to measure the competence of employees, especially in regulated areas such as cybersecurity, where certificates are required to comply with government regulations. The value of certificates: The value of the certificate depends on three factors: competence (the skills it represents), suitability (how relevant it is to the job), and recognition (how popular it is in the market).	The ways used in paper Quantitative analysis Using data from The Current Population Survey (CPS) of the US Bureau of Labor Statistics (BLS) to measure the percentage of computing workers with certificates or licenses. Qualitative analysis to discuss the motivation of employees and employers to obtain or request certificates, based on the economic and professional context. Data collection tools such as job listing analysis (EMSI) previous studies and reports

Conflicts between the findings:

1. Fisher, E., & González, Y. S. (2020). Qualifications and Certificates v Practical Knowledge and Experience: Is There a Winner? *Business and Economic Research*, 10(2), 1. <https://doi.org/10.5296/ber.v10i2.16520>
2. Givens, R. J. (2003). Professional Certification: The Practical Side--To Be or Not To Be. *Journal of the American Association of Grant Professionals*, 2(2), 37-43.
3. Wen, I. J., & Liang, C. W. (2021). An Empirical Study of Professional License Acquisition: Theory of Planned Behaviour View.
4. Atkinson, J. L. (1989). Credentials, competencies, and certification. *Allerton Park Institute* (28th: 1986).
5. Heise, J. M. (2009). *Professional certifications versus skills: A study of professional certifications from the perspective of the certified and their employers* (Doctoral dissertation, Capella University).
6. Tannian, M., & Coston, W. (2021). The role of professional certifications in computer occupations. *Communications of the ACM*, 64(10), 56-63.