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# A STUDY OF DIGITAL COMPETENCE OF B.ED STUDENT-TEACHERS IN RESPECT OF THEIR SELF-MONITORING

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## ABSTRACT

The rapid integration of technology into the field of education has made digital competence a important skill for prospective teachers. In modern classrooms, student-teachers are expected not only to implement digital tools but also to regulate their learning behaviors appropriately. Among the various components of self-monitoring of learning. self-monitoring plays a important role in enabling individuals to evaluate and adapt their actions, which in turn promotes. The meaningful use of technology for teaching and learning. The present study aims to examine the level of digital competence among B.Ed student-teachers and to examine its relationship with their self-monitoring ability. A sample of 200 B.Ed 2nd year student-teachers, consisting of 100 males and 100 females, was selected through stratified random sampling from teacher education institutions. The descriptive survey method was employed for data collection. Standardized scales measuring self-monitoring and digital competence were administered to the participants.

The results showed that B.Ed student-teachers showed an average level of digital competence. Comparisons of both sexes found no significant difference in terms of digital competence and self-monitoring between male and female student-teachers, which implies equal readiness for both genders. There was a significant positive association between digital competence and self-monitoring, suggesting that people with more self-regulation skills are likely to make better use of digital learning environments.

The study suggests the need to include digital pedagogy, self-regulated learning skills and reflective teaching processes in the B.Ed program to enhance teacher readiness and competency in the digital age.

***Keywords*:** *Digital competence, Self-monitoring, B.Ed student-teachers, Teacher education, Meta cognition, ICT Skills*

## THE STUDY'S INTRODUCTIONAND BACKGROUND

The 21st century education system needs tech-savvy teachers who know how to use technology to support teaching, assess students, engage with the classroom and for their own professional development. Teacher education programs, like Bachelor of Education (B.Ed), are crucial in equipping pre-service teachers for the future as technology confident teachers.In this regard, digital competence has become a necessity.

Digital competence refers to the ability to use digital technology effectively, responsibly, critically, and creatively for learning and communication. According to European Commission (2020)[1], it includes information literacy, digital communication, digital content creation, problem-solving, and digital safety. For student-teachers, digital competence is essential not only for instructional practices but also for managing administrative tasks, accessing online resources, and adapting to modern pedagogical models such as flipped

classroom, blended learning, and virtual learning environments. (Siddiq et al., 2016)[20]Self-monitoring is another crucial element influencing learning outcomes. It refers to an individual's ability to evaluate and regulate their behaviour, thoughts, and performance based on goals or standards. In the context of teacher training, self-monitoring helps student-teachers reflect on their digital usage habits, identify gaps, and improve upon them.

It promotes safe and ethical use of technology and enables lifelong learning.(Schraw & Dennison, 1994)[21]. The National Education Policy (NEP) 2020[2]supports the integration of digital technologies in teacher education and suggests pre-service teachers need to be equipped with techno-pedagogical skills and meta cognitive strategies. Therefore it is important to investigate the state of digital competence of the B.Ed student-teachers and its link to self-monitoring is crucial.

## STATEMENT OF THE PROBLEM

In the present digital era, digital competence has become an essential professional requirement for prospective teachers. B.Ed. student-teachers are expected to effectively integrate digital tools into teaching and learning processes. Self-monitoring plays a crucial role in regulating learning behavior, reflection, and adaptive teaching practices. However, limited research has examined the relationship between digital competence and self-monitoring among B.Ed. student-teachers. Understanding this relationship is important for strengthening teacher education programmes. Therefore, the present study focuses on examining the digital competence of B.Ed. student-teachers in relation to their self-monitoring.

## REVIEW OF RELATED LITERATURE:

Research on self-monitoring consistently highlights its multifaceted role in learning, teaching, and behavior regulation across educational contexts. Foundational work by **Snyder (1974)[12]**conceptualized self-monitoring as an individual's capacity to regulate behavior and self-presentation in response to social cues, establishing distinctions between high and low self-monitors that remain influential in educational psychology.

Later empirical research has applied this construct in the classroom environment and showed that self-monitoring is effective in improving time-on-task and decreasing off-task behaviour of students with learning difficulties and behavioural problems(**Amato-Zech, Hoff and Doepke (2006)**[11]; **Crutchfield et al. (2015)**[7]and in improving academic performance when combined with peer tutoring for students with emotional and behavioural disorders (**Hott, Evmenova, and Brigham (2014)[8]**). In higher education and technology-enhanced learning, self-monitoring has been found to be positively related to academic performance and technology use, highlighting its significance as a key metacognitive regulation skill rather than as a product of technology (**Wong et al. (2019)**[10]. But research byGraham et al. (2025)**[3]**shows that, while self-monitoring boosts cognitive involvement and time-on-task, it does not necessarily lead to better performance under different task demands, suggesting the need for guidance to inform self-judgment. In the teaching profession, systematic reviews and empirical studies show overall positive outcomes of self-monitoring on teachers' professional functioning, efficacy and continuous improvement **Layden, Crowson, and Hayden (2023)[4]**; **Suknaisith(2021)[5]**,but with concerns over potential emotional and psychological impacts depending on how teachers perceive job demands (**Huang and Yin (2020)[6]**). Nonetheless, self-monitoring has also been shown to be associated with social motivation and influence, with high self-monitors being more active in opinion leadership and seeking (**Kim (2011)[9]**). In summary, the literature suggests that self-monitoring is a strong predictor of engagement, self-regulatory and professional performance across the education spectrum, but

its efficacy is dependent upon contextual factors, task demands and individual perceptions, highlighting the need for more sophisticated and integrated research methods.

**OBJECTIVES OF THE STUDY**:

1. To assess the digital competence of male and female B.Ed. student-teachers with high self-monitoring levels.
2. To evaluate the digital competence of male and female B.Ed. student-teachers with low self-monitoring levels.
3. To examine the relationship between self-monitoring and digital competence.

**HYPOTHESES OF THE STUDY**

**The present study is based on the following hypotheses:**

1. There is no significant difference in the digital competence of male and female B.Ed. student-teachers who exhibit a high level of self-monitoring.
2. There is no significant difference in the digital competence of male and female B.Ed. student-teachers who exhibit a low level of self-monitoring.
3. There is no significant relationship between self-monitoring and digital competence among B.Ed. student-teachers.

**METHODOLOGY:**

In the present study, the investigator employed the survey method to achieve the research objectives effectively. The study was comparative in nature and involved prospective teachers pursuing the second year of the Bachelor of Education (B.Ed.) programme. The participants were selected from colleges of education affiliated with CCS University, Meerut, Uttar Pradesh. The major purpose of the investigation was to assess the self-monitoring abilities of these prospective teachers and compare their levels to identify possible variations or patterns. By examining differences in self-monitoring skills among the participants, the study aimed to understand their capacity for behavioural regulation. The findings are expected to provide meaningful insights into the self-regulatory practices of future educators in the region and contribute to enhancing teacher preparation.

**POPULATION AND SAMPLE OF THE STUDY**:

The population for the present study consisted of the prospective teachers studying in the B.Ed. programme in Government, Government-Aided and Self Finance Colleges affiliated by CCS University Meerut UP. From the population, the investigator selected 200 student teachers of second year B.Ed. programme by applying stratified random sampling technique

**RESEARCH INSTRUMENTS USED IN THE STUDY**:

| Research Instrument | Instrument /Scale | Type |
|---|---|---|
| Digital Competence Assessment Questionnaire | Shipra Srivastava and Kiran Lata Dangwal | Cluster scoring method |
| Self-Monitoring scale | Amit Abraham and Priyanka Neeta | Standardized |

In the present study, self-monitoring was assessed using the *Samvaidna's Self-Monitoring Scale* standardized by Amit Abraham and Priyanka Neeta (2013). The scale consists of 22 statements aimed at measuring self-monitoring behaviour among individuals. The first 11 statements assess high self-monitoring, reflecting an individual's ability to regulate and adapt behaviour according to social cues, while the remaining 11 statements measure low self-monitoring, indicating a tendency to maintain consistent behaviour regardless of external situations. This standardized tool provides a balanced and comprehensive evaluation of self-monitoring traits and ensures reliable measurement of participants' behavioural regulation ability.

For assessing digital competence, the *Digital Competence Assessment Questionnaire* developed by Shipra Srivastava and Kiran Lata Dangwal was used. The questionnaire follows the cluster scoring method and evaluates multiple dimensions of digital competence, enabling a systematic assessment of the participants' skills and confidence in using digital tools for educational purposes. The use of these two validated instruments ensured accuracy, reliability, and objectivity in data collection for the study.

## RELIABILITY OF THE INSTRUMENT

The reliability of the tools used in the current study were analysed.The Digital Competence Questionnaire was highly reliable, with a coefficient of 0.90 using the test–retest method.The Self-Monitoring Scale was also quite reliable, with a coefficient of 0.84 using the split-half method.

## VALIDITY OF THE INSTRUMENT

The reliability index was used to assess the validity of the tools.The Digital Competence Questionnaire had a validity coefficient of 0.89 and the Self-Monitoring Scale obtained a validity coefficient of 0.92.This suggests that these tools are valid for this study.

## STATISTICAL TECHINIQUE USED IN THE STUDY :

- Mean and Standard Deviation
- t-test
- Pearson Correlation

❖ The t-test was used to examine the differences in digital competence between male and female B.Ed. student-teachers with high and low levels of self-monitoring.

❖ The correlation test was applied to determine the relationship between self-monitoring and digital competence among male and female B.Ed. second-year student-teachers..

## DELIMITATION OF THE STUDY:

To ensure smooth execution of the research within the available time, energy, and resources, the study has been delimited in the following ways:

- The study is restricted to colleges affiliated with Chaudhary Charan Singh University, Meerut.
- Only B.Ed. second-year students have been included as participants.

  The sample size has been limited to 200 participants

## DATA COLLECTIONPROCEDURE

The required data were collected by administering the standardized tools to the selected sample of B.Ed. student-teachers. Clear instructions were given to the respondents, and the collected data were carefully checked for completeness before analysis.

## DATA ANALYSIS PROCEDURE:

After the collection of data, the responses were carefully coded and organized for analysis. Appropriate statistical techniques were selected in accordance with the objectives of the study. The data were analyzed using both descriptive and inferential statistics. The results were systematically interpreted to draw meaningful conclusions related to the research problem.

## HYPOTHESIS 1:

There is no significant difference between the digital competence of male and female B.Ed student- teachers with high self- monitoring level.

**Table 1**

**Showing the high levels of Self- monitoring ofmale andfemaleB.Ed student- teachers**

| DIGITAL COMPETENCE | | | | | | | |
|---|---|---|---|---|---|---|---|
| | GENDER | N | M | SD | T-RATIO | TABLE VALUE | LEVEL OF SIGNIFICANCE ( 0.05 ) |
| HIGH SELF-MONITORING | MALE | 50 | 53.3 | 4.8 | 3.84 | 1.96 | STATISTICALLY SIGNIFICANT. |
| | FEMALE | 50 | 56.5 | 3.4 | | | |

Null hypothesis is rejected

**The graph represents the results related to high levels of Self- monitoring of male and female B.Ed student- teachers**

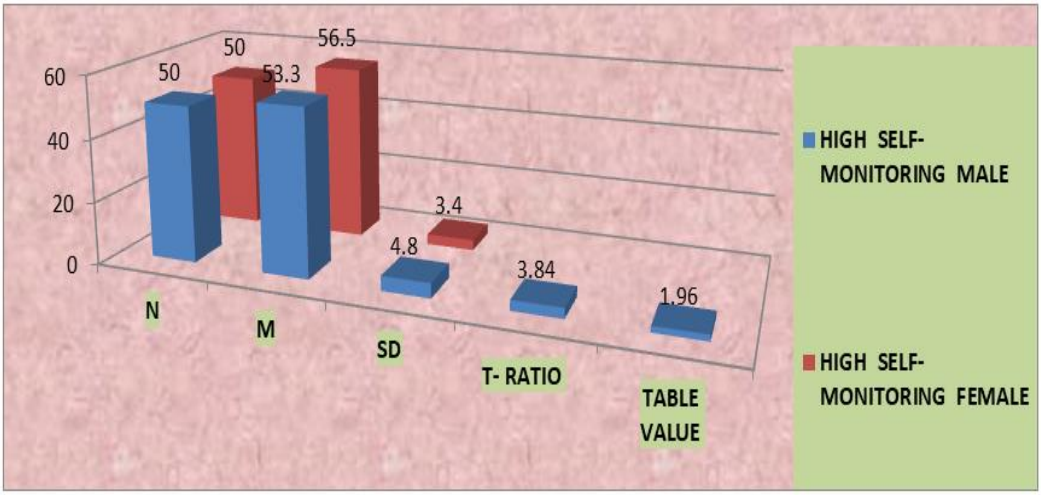


**Figure: 1**

**INTERPRETATION:**

The mean score of digital competence among high self-monitoring male student-teachers is **53.3** with a standard deviation of **4.8**, whereas the mean score for high self-monitoring female student-teachers is **56.5** with a standard deviation of **3.4**. The obtained **t-ratio of 3.84is** greater than the **table value of 1.96** at the **0.05 level of significance**. Therefore, the difference between the digital competence scores of male and female student-teachers with high self-monitoring is **statistically significant**.

This result indicates that **female student-teachers with high self-monitoring possess higher digital competence than their male counterparts**. It suggests that female prospective teachers may be more effective in utilizing digital tools and technologies in learning environments when they demonstrate strong self-regulation skills. The finding highlights the importance of supporting and enhancing digital competence among male student-teachers, particularly those with high self-monitoring traits.

**HYPOTHESIS 2:**

There is no significant difference between the digital competence of male and female B.Ed students with low self- monitoring level.

**Table 2**

**Showing the low level of self- monitoring of male and female B.Ed student- teachers**

| DIGITAL COMPETENCE | | | | | | | |
|---|---|---|---|---|---|---|---|
| | GENDER | N | M | SD | T-RATIO | TABLE VALUE | LEVEL OF SIGNIFICANCE ( 0.05 ) |
| LOW SELF-MONITORING | MALE | 50 | 36 | 3.3 | 1.26 | 1.96 | There is no statistically significant |
| | FEMALE | 50 | 37 | 4.5 | | | |

Null hypothesis is accepted.

**The graph represents the results related to low levels of Self- monitoring of male and female B.Ed student- teachers**

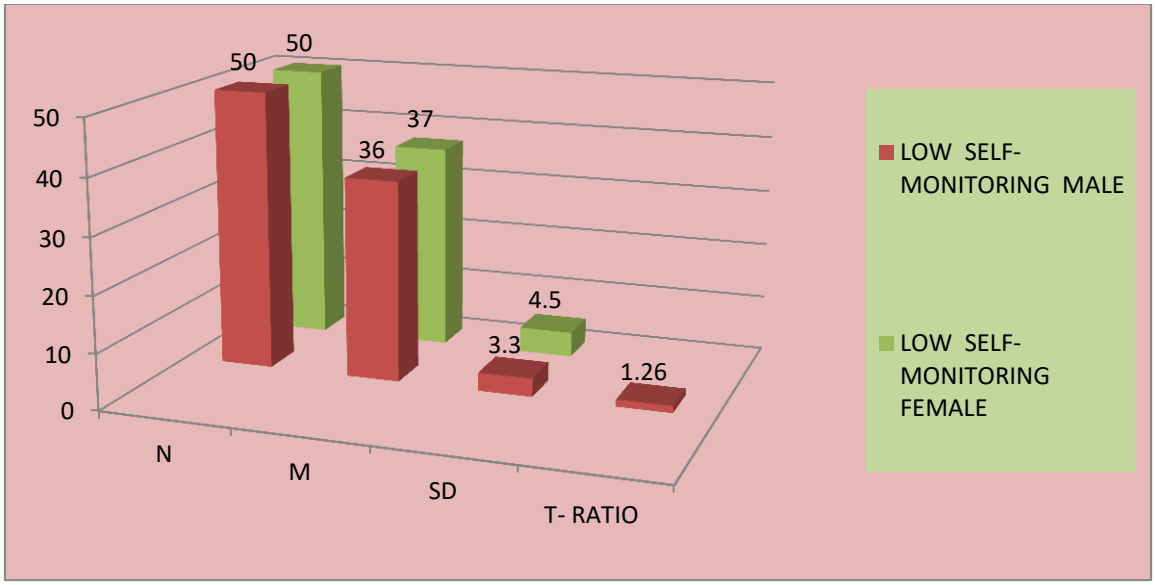


**Figure: 2**

**INTERPRETATION:**

The mean score of digital competence among low self-monitoring male student-teachers is **36** with a standard deviation of **3**.3, while the mean score for low self-monitoring female student-teachers is **37** with a standard deviation of **4.5** The obtained **t-ratio of** 1.26 is lower than the **table value of 1.96** at the **0.05 level of significance**. Therefore, the difference between the digital competence scores of male and female student-teachers with low self-monitoring is **not statistically significant**.

This result indicates that **male and female student-teachers with low self-monitoring have nearly similar levels of digital competence**. In other words, when self-monitoring ability is low, gender does not appear to play a meaningful role in determining digital competence. This finding suggests that irrespective of gender, students with low behavioural regulation tend to demonstrate similar digital competence levels, emphasizing the importance of strengthening self-monitoring skills to enhance digital preparedness among prospective teachers.

**HYPOTHESIS 3 :** There is no significant difference between the self- monitoring and Digital Competence .

**Table 3**

**Showing the relationship between Self- Monitoring and Digital Competence**

| RELATIONSHIP BETWEEN SELF- MONITORING AND DIGITAL COMPETENCE | | | | |
|---|---|---|---|---|
| VARIABLE | N | R | TABLE VALUE | SIGNIFICANCE LEVEL - 0.05 |
| DIGITAL COMPETENCE | 200 | 0.141 | 0.138 | SIGNIFICANT |

| | | | | |
|---|---|---|---|---|
| SELF-MONITORING | | | | |

**Null Hypothesis is rejected**.

**The graph represents the results related to relationship between Self- Monitoring and Digital Competence**

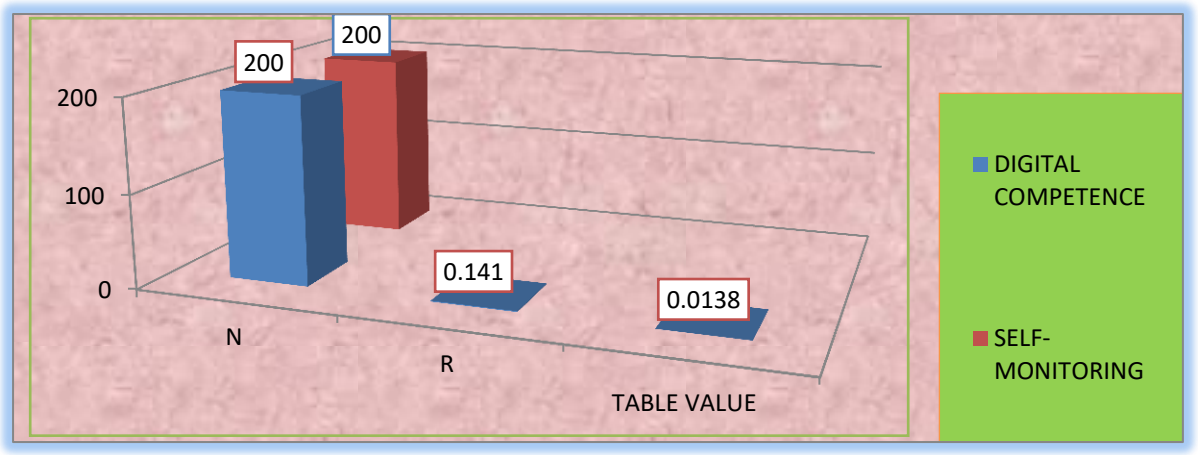


**Figure :3**

**INTERPRETATION:**

The correlation between self-monitoring and digital competence of 200 participants is shown in the table.The correlation coefficient (r = 0.141) suggests a positive relationship between the two variables.This implies that higher levels of self-monitoring are associated with higher levels of digital competence.The correlation value is greater than the table value (0.138) at the 0.05 significance level, which means that the correlation is significant. Therefore, the findings establish that student-teachers with stronger self-monitoring abilities are more likely to demonstrate higher levels of digital competence. This highlights the importance of self-regulatory behaviour in enhancing the effective use of digital tools and technologies.

**MAJOR FINDINGS OF THE STUDY :**

The following major finding of the present investigation:.

- Female with high self-monitoring levels have exhibited **significantly higher digital competence** than Male.
- The study highlights that gender differences existd in digital competence among B.Ed. student-teachers with low self-monitoring levels, with female showing a marginal advantage.
- These findings highlight the need for **targeted interventions** to address gender differences and enhance digital competence, particularly for male, in the context of self-monitoring level.
- These findings underscore the need to address gender disparities in digital competence and to develop strategies to enhance digital literacy among B.Ed. student-teachers, especially for male with low self-monitoring levels.

## DISSCUSSION OF THE RESULT:

### Discussion Related to Hypothesis 1

Hypothesis 1 stated that there is no significant difference between the digital competence of male and female B.Ed. student-teachers with high self-monitoring level.The findings of the present study reveal that female student-teachers with high self-monitoring possess significantly higher digital competence than their male counterparts. Hence, the null hypothesis is rejected.

This result is consistent with the findings of **Hatlevik** and **Christophersen (2013)**[13]who reported that female learners with stronger self-regulatory and self-monitoring skills demonstrated higher digital competence. Similarly, **Krumsvik (2011)**[14]found that teacher trainees with high self-monitoring, particularly females, showed better proficiency and confidence in using digital tools for educational purposes. These research studies highlight that reflective learning, self-assessment and goal-setting self-monitoring play an important role in enhancing digital competence.This study concurs with these perspectives and emphasises the role of self-monitoring in improving digital competence of female student-teachers.

### Discussion Related to Hypothesis 2

Hypothesis 2 proposed that there is no significant difference between the digital competence of male and female B.Ed. student-teachers with low self-monitoring level.The results indicate that male and female student-teachers with low self-monitoring have nearly similar levels of digital competence. Therefore, the null hypothesis is accepted.

This finding is in line with the study conducted by **Ng** (**2012**)[15] who observed that when learners exhibit low self-regulatory and self-monitoring abilities, gender differences in digital competence tend to diminish. Likewise, **Siddiq**, **Gochyyev, and Wilson (2017)**[16]reported that limited metacognitive awareness and low self-monitoring restrict the development of digital skills, resulting in comparable digital competence among male and female learners. The present study confirms that inadequate self-monitoring neutralizes gender-based differences in digital competence.

### Discussion Related to Hypothesis 3

Hypothesis 3 stated that there is no significant relationship between self-monitoring and digital competence.

This is not the case as the results demonstrate that self-monitoring and digital competence is significantly correlated. Therefore, the null hypothesis is rejected.

This finding is well supported by previous research .**Zimmerman (2000)**[17]highlighted that self-monitoring is a key aspect of self-regulation and is important to manage complex learning tasks, such as using digital technologies. Moreover, **Schraw, Crippen, and Hartley (2006)**[18]reported that students who engage in monitoring and evaluating their learning processes have higher digital and technology skills. Also, **Hatlevik et al. (2015)**[19]found a significant positive correlation between self-monitoring and digital competence in students, especially in teacher education programs. Our study is consistent with these reports, and shows that self-monitoring is a significant predictor of digital competence of B.Ed. student-teachers.

## EDUCATIONAL IMPLICATIONS:

There are significant educational implications of self-monitoring by B.Ed. students on their digital competency because digital competency is an essential skill for today's teachers.For B.Ed. students, self-monitoring helps in the development, monitoring and improvement of their digital tool and resource use for teaching.

- Self-monitoring prompts students to assess their proficiency in the use of digital tools, software and platforms, and identify areas to improve.
- Self-monitoring helps to develop a lifelong learning mindset, which is essential to stay up-to-date with educational technologies.
- Motivates them to participate in online courses, webinars, or workshops on digital teaching skills.
- Self-monitoring enables B.Ed. students to assess their digital teaching techniques and optimise them.
- Encourages the integration of technology into lesson plans, enhancing student engagement.

## SUGGESTIONS FOR FURTHER STUDY

The following suggestions are proposed for future research:

- The present study was conducted on students from 16 education colleges affiliated with CCS University, Meerut. Future investigations may include a larger sample from education institutions across various districts of Uttar Pradesh to enhance the generaliz ability of the findings.
- Only second-year student-teachers were considered for the current study. Future studies may include first-year student-teachers as well to understand digital competence and self-monitoring across different stages of teacher education.
- The scope of the study may be extended to students from other academic disciplines such as medical sciences, engineering, law, arts, and pure sciences to determine whether the relationship varies across professional streams.
- Further research may include in-service teachers to examine whether self-monitoring and digital competence progress or vary with classroom experience and professional training.
- A comparative study between rural and urban students or between different socio-economic backgrounds may be conducted to understand how social factors influence digital competence and self-monitoring.
- Longitudinal studies may be undertaken to track changes in digital competence and self-monitoring over time rather than at a single point.
- Future studies may explore the impact of ICT-based training programmes, digital literacy workshops, or self-regulation interventions on improving digital competence among student-teachers.

## CONCLUSION

- Self-monitoring is a powerful andessential skill that plays a significant role in shaping and improving an individual’s behaviour. It encourages individuals to take responsibility for their actions by fostering a sense of personal accountability. As an

effective and versatile strategy, self-monitoring has a positive influence on academic performance, behavioural adjustment, and social development.

- Specifically for student-teachers, self-monitoring is extremely useful in enhancing their self-management skills which are crucial for their personal and professional development.It is a non-invasive and highly effective preventive strategy that allows people to control their behaviour without the need for constant monitoring.
- By teaching student-teachers to critically analyse their behaviour, they become more conscious of their actions and how appropriate they are in different situations.This helps them to make the necessary behaviour adaptations, fostering autonomy and responsibility.By continuously assessing their behaviour against set standards, student-teachers come to align themselves with professional and community norms.
- Additionally, self-monitoring aids in the cultivation of discipline, focus and flexibility - essential qualities for an effective teacher.Through the learning of self-monitoring, student-teachers not only improve their individual and professional effectiveness but also inspire their future students.In turn, this skill helps to develop effective, responsible and reflective teachers, ready to adapt to the ever-changing educational environment.

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