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Article

Grading for success: Career and technical education educators' practices for evaluating employability skills

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Abstract: Employers consistently highlight a gap in essential employability skills among new hires, citing deficiencies in communication, critical thinking, professionalism, leadership, and problem-solving—all foundational to Ohio's Career and Technical Education (CTE) curriculum. CTE educators are crucial in evaluating students' proficiency in these key competencies, ensuring they are prepared for workforce demands. This study examines CTE teachers' grading and assessment practices, exploring potential relationships between these methods and various demographic factors. A survey of 99 CTE educators across diverse career fields revealed that CTE teachers primarily assess employability skills through behavioral observations, work habits, and professionalism. Notably, 93% of respondents utilize authentic assessments, emphasizing real-world skill applications. However, significant inconsistencies in grading approaches emerged, particularly across career fields. These findings highlight the need for professional development initiatives to promote research-based grading practices. Standardizing assessment measures can enhance the reliability and effectiveness of evaluations, ensuring students are adequately prepared for the workforce.

Keywords: assessment; career and technical education; CTE; employability skills; grading practices

1. Introduction

Humans begin learning from birth, continuously acquiring knowledge and skills that shape their educational and professional journeys. Throughout elementary and secondary education, students build foundational knowledge that prepares them for future academic and career pursuits. High school is a critical juncture in the United States where students choose between pathways leading to higher education or direct entry into the workforce. Career and Technical Education (CTE) programs are pivotal in preparing students for successful careers by equipping them with technical expertise and essential employability skills.

Unlike traditional academic courses, CTE programs offer hands-on learning experiences that simulate real-world work environments, helping students develop industry-specific competencies alongside soft skills such as communication, teamwork, and adaptability. These programs bridge the gap between classroom learning and workforce expectations, ensuring students graduate with the skills necessary to thrive in their chosen careers. The importance of CTE extends beyond individual student success, contributing to a well-trained workforce that meets industry demands and drives economic growth.

1.1. Human capital theory and employability skills

Human capital theory posits that individuals invest in education and skill development to increase productivity, expand career opportunities, and enhance their overall economic value. Education is a critical investment in workforce development, equipping students with technical expertise and essential employability skills [1,2]. CTE programs integrate these skills, preparing students for career success by blending academic learning with hands-on training [3]. Employers increasingly value problem-solving, teamwork, and adaptability, making employability skills a key component of educational curricula [4,5].

Career and technical education (CTE) is vital in addressing the nation's workforce needs [6]. These programs provide students with specialized expertise, advanced technical skills, and hands-on experience essential for success in competitive, in-demand industries. By fostering both academic diligence and practical expertise, CTE ensures that students graduate prepared for both college and the workforce. As industries continue to evolve, CTE remains crucial in developing a skilled workforce capable of meeting the demands of an ever-changing job market [7].

1.2. Career and technical education in Ohio

Ohio's CTE framework structures courses into career clusters, pathways, and programs to align with workforce demands. The Ohio Department of Education (ODE) defines content standards for each career field, ensuring students acquire essential skills [8,9]. A critical component, Strand 1: Business Operations/21st Century Skills, embeds employability skills across all career pathways [10]. Students are assessed through WebXam, a standardized tool developed by The Ohio State University's CETE, which categorizes performance as nonproficient, proficient, or advanced [11,12].

1.3. Grading practices and assessment methods

Grading serves as both a communication tool and a measure of student achievement. Traditionally, grades have incorporated factors such as academic performance, effort, and behavior [13]. However, inconsistencies in grading practices can obscure an accurate representation of student learning. Research suggests that teachers' grading decisions are influenced by personal beliefs, professional training, and institutional policies [14–19].

The assessment of employability skills remains complex, as teachers often blend content mastery with behavioral indicators. Studies indicate that teachers utilize both formative and summative assessments, but inconsistencies in grading approaches persist, especially in CTE courses [16,20–22]. Including nonachievement factors—such as effort, participation, and punctuality—further complicates the assessment of employability skills [23–25]. Standardized grading measures could improve consistency and ensure that evaluations accurately reflect student competencies [26].

2. Methods

The current investigation will address the following research questions.

1) Are there grading practices that CTE teachers use more than others with respect to employability skills?
2) Are there assessment practices that CTE teachers use more than others with respect to employability skills?
3) Is there a relationship between teachers' employability skills grading and assessment practices and their related career field, educational attainment level, gender, number of years spent in education, number of years spent in industry before starting their career in education, related career field, or age?

2.1. Participants

The study surveyed Ohio CTE educators instructing grades 9–12 across Ohio's career fields. CTE programs operate within Career-Technical Planning Districts (CTPDs) and include Joint Vocational School Districts (JVSDs). Participants were selected using purposive convenience sampling, ensuring respondents held the necessary educator licenses and had experience assessing employability skills.

2.2. Instrumentation

The Secondary Career and Technical Educators Grading and Assessment of Employability Skills Survey was adapted from McMillan's Survey of Assessment and Grading Practices—Secondary Form [23]. This 41-item survey employed a six-point Likert scale to measure grading factors, assessment methods, and cognitive levels of assessments. Additionally, three open-ended questions provided qualitative insights into teachers' grading rationales. This survey is provided: https://docs.google.com/document/d/17Hp_lb5RwtbFGdF4lW71NS8eAFDgLnrL/edit?usp=drive_link&ouid=113672863274724676883&rtpof=true&sd=true.

2.3. Data collection and analysis

Data were collected via an online survey distributed through professional networks and snowball sampling. The data was exported from the Google Form to an Excel spreadsheet and then imported into the SPSS Statistics Grad Pack 29.0 Standard for analysis. Responses were analyzed, employing multivariate analysis to examine correlations between teachers' demographic variables and grading practices. Ethical considerations were maintained through Institutional Review Board (IRB) approval, and participation was voluntary.

3. Results

3.1. Demographics

This study examines the evaluation practices of educators at Career and Technical Education (CTE) schools in Ohio concerning employability skills. Among the 99 survey respondents, 56.6% identified as male, and 43.4% as female. These figures contrast with national data, where female CTE teachers comprise 55% of the workforce. Institutional affiliation data indicate that the majority (89.9%) of respondents teach in a Joint Vocational School District (JVSD) Career-Technical

Planning District (CTPD), while smaller proportions are affiliated with compact (4.0%) or comprehensive (6.1%) CTPDs.

Ethnic representation among respondents was predominantly White (97.0%), with less than 1% representation from Hispanic or Latino, Black or African American, and Multiracial or Biracial educators. This distribution differs significantly from national CTE teacher demographics, where 7.9% identify as Black and 6.8% as Hispanic. Age distribution data indicate that Ohio's CTE teachers are a seasoned workforce, with 52.5% aged 51 years or older and 29.3% aged 56 or above. Additionally, most transitioned from industry careers, with 65.7% spending 20 years or less in their fields before entering education, highlighting substantial industry expertise.

Teaching experience also reflects a well-established group, as over 65% of respondents have more than ten years of teaching experience. A significant portion (39.4%) hold master's degrees, and 25.3% possess bachelor's degrees, though this falls below the national average, where 89% of CTE teachers have at least a bachelor's degree. Respondents represent diverse career fields, with the largest groups from health science (14.1%), information technology (10.1%), construction technologies (9.1%), manufacturing (10.1%), and transportation systems (9.1%). These findings underscore the depth of industry expertise among Ohio's CTE teachers and highlight an aging workforce that may impact future recruitment and retention efforts.

3.2. Grading practices for employability skills

To address the first research question, which examines the grading practices used by CTE teachers for assessing employability skills, survey results reveal a strong emphasis on professionalism, work habits, and behavior. **Table 1** presents the grading factors considered in assessing student mastery of employability skills.

Findings indicate that 76% of educators integrate student conduct into employability skill grading to a considerable extent. Work habits are similarly emphasized, with 88.9% of teachers factoring them into grading and 58.6% using them extensively or completely. Professionalism and employability points are heavily weighted, with 83.8% of respondents incorporating them significantly and 61.6% doing so extensively or completely. To quantify grading reliance, responses to ten grading factors were aggregated into a grading factor score, yielding a mean of 40.92 (SD = 8.44), with normal skewness (−0.97) and kurtosis (1.91).

Table 1. Percentages of teachers' responses of items that teachers use as factors in determining grades for students' mastery of employability skills.

	Frequency of Factors					
	1	**2**	**3**	**4**	**5**	**6**
	Not At All	**Very Little**	**Some**	**Quite A Bit**	**Extensively**	**Completely**
Performance compared to a set scale of percentage correct	5.1	10.1	26.3	35.4	19.2	4.0
Specific competencies or outcomes mastered	4.0	4.0	13.1	29.3	36.4	13.1

Table 1. (*Continued*).

	Frequency of Factors					
	1	**2**	**3**	**4**	**5**	**6**
	Not At All	**Very Little**	**Some**	**Quite A Bit**	**Extensively**	**Completely**
Student effort how much the student tried to learn	2.0	7.1	25.3	34.3	24.2	7.1
Degree to which student pays attention and or participates	4.0	8.1	25.3	28.3	27.3	7.1
Effort	4.0	5.1	16.2	28.3	39.4	7.1
Improvement	5.1	8.1	10.1	32.3	35.4	9.1
Behavior	4.0	5.1	15.2	29.3	34.3	12.1
Work habits	3.0	2.0	6.1	30.3	40.4	18.2
Disruptive student performance	9.1	14.1	24.2	24.2	22.2	6.1
Professionalism/ employability points	4.0	4.0	8.1	22.2	39.4	22.2

3.3. Teacher perspectives on employability skill evaluation

CTE teachers' perspectives on current evaluation methods for employability skills were surveyed. Among the 99 respondents, 43.4% agreed with existing practices, 40.4% disagreed, and 16.2% were uncertain. Common criticisms included the overreliance on knowledge-based assessments rather than performance evaluations. Eight respondents highlighted the inefficacy of Webxams in assessing practical employability skills, emphasizing the need for performance-based measures.

A recurring theme in teacher responses was the need for accountability. Eleven teachers explicitly mentioned student accountability, and nine expressed concerns over a lack of consequences for poor performance. Some suggested adopting a "hire/fire" system, where students failing to meet expectations could be sent back to their associate schools. These findings reinforce the prioritization of attempts, improvement, conduct, work habits, and professionalism in employability grading.

3.4. Assessment practices for employability skills

To address the second research question concerning assessment practices, survey responses indicate a strong preference for authentic assessments, with 93% of respondents using them frequently and 72.8% employing them extensively or completely. Individual student projects are also widely used, with 77.8% incorporating them significantly. Teacher-created assessments are utilized by 69.7% of respondents, though only 38.4% use them extensively or completely. Responses across 11 assessment factors were aggregated into an assessment score, yielding a mean of 41.19 (SD = 8.75), with normal skewness (−0.38) and kurtosis (1.19).

Teachers who favored current evaluation practices cited the flexibility to use their own assessment methods. Observational assessments of student performance were particularly valued. Teachers advocating for changes emphasized the need to align assessments with real-world job expectations, suggesting internships, apprenticeships, clinical experiences, and work-based learning as optimal methods.

3.5. Cognitive level of assessments

Survey findings indicate that CTE teachers primarily use assessments to evaluate how well students apply their employability skills. Notably, 93% of respondents reported using assessments measuring the application of knowledge quite a bit or more, with 72.8% employing them extensively or completely. Conversely, assessments focusing on knowledge recall were used extensively or completely by only 15.2% of respondents. A cognitive level of assessment score was computed, with a mean of 16.91 (SD = 3.94), demonstrating normal distribution properties (skewness = −0.98, kurtosis = 2.09).

3.6. Relationship between demographics and grading/assessment practices

The third research question explored how various educator characteristics—including career field, level of educational attainment, gender, teaching experience, industry experience, and age—relate to grading and assessment practices in Career and Technical Education (CTE). A Pearson's zero-order correlation analysis found no statistically significant relationships between grading or assessment methods and demographic factors such as age, gender, years in education, or highest degree earned.

However, the analysis identified two key factors—career field and duration of industry experience—as significantly correlated with grading and assessment practices. These findings suggest that while broad demographic characteristics do not appear to influence how CTE teachers assess students, professional background and industry tenure may shape grading decisions, potentially reflecting industry-specific standards, skill expectations, or pedagogical perspectives shaped by real-world workforce demands.

Further analysis identified a significant positive correlation between time in an associated career field and grading factors (r = 0.206, p < 0.05). Similarly, career field was significantly correlated with assessment types (r = 0.248, p < 0.05) and cognitive level of assessments (r = 0.228, p < 0.05). Reliability analysis confirmed the internal consistency of each factor, with Cronbach's alpha values ranging from 0.835 to 0.890, indicating acceptable reliability.

A multivariate analysis of variance (MANOVA) was conducted to examine the effects of time in an associated career field and career field on grading and assessment practices. Results indicate a significant main effect of time in an associated career field (p = 0.014) and career field (p < 0.001) on the multivariate factors. However, no significant interactions were found with career field and career field.

Subsequent tests of between-subject effects showed that career field significantly influenced grading factors (p = 0.032), whereas no significant effects were found for the other assessment-related factors. A secondary MANOVA, conducted without time in an associated career field to mitigate multicollinearity, confirmed a statistically significant interaction between the career field and grading factors. The detailed methods, results, and analysis of this study are available: https://docs.google.com/document/d/1nazcsap9FIBbrr-

IW3Ilgy59DcZ1l9Fk/edit?usp=drive_link&ouid=113672863274724676883&rtpof=true&sd=true

4. Discussion

This investigation examined Career and Technical Education (CTE) teachers' methods for determining student mastery of skills needed to increase their likely employment. Teachers frequently used each scholar's work, conduct, work tendencies, skills, and points regarding being professional and employable to assign grades. Common assessments included authentic tasks, individual projects, and teacher-created assessments, emphasizing the application of knowledge rather than the recall of facts. Additionally, the study explored relationships between teachers' grading practices and variables such as career field, education level, experience, and age. Results indicated a modest relationship between career field and assessment type or cognitive level. The career field significantly influenced grading factors, while time spent in the field showed limited impact.

4.1. Grading factors and employability skills assessment

Findings for Research Question One revealed that CTE teachers most frequently used the class points regarding being professional or demonstrating skills aligned with employability, work habits, mastery of specific capabilities, and student conduct as grading aspects. Approximately 61.6% of respondents reported using professionalism/employability points extensively or completely. However, some teachers expressed frustration with school policies that prohibited using these points in grades, arguing that such restrictions reduced student accountability. One teacher stated, "We are now not allowed to grade on employability in our own classes… this takes away from the accountability that is necessary for students". Open-ended survey responses underscored teachers' belief that employability skills assessments should mirror real-world accountability. Eleven teachers specifically highlighted the need for student accountability, citing concerns such as absenteeism and lack of professionalism. One teacher remarked, "Employability skills should be treated just like in the workforce. You show up and work; you get paid. Absenteeism would be based on reasoning". Another stated, "We aren't allowed to deduct points for student absences. That isn't how the real world works".

Teachers linked employability skills assessment to preparing students for workforce expectations, including punctuality, professionalism, and passing background checks. Some teachers proposed a "hire and fire" model within classrooms, where students could be dismissed from the program if they failed to meet expectations. One suggested, "Turn the classroom into a real-world job site. Hire and fire students; give promotions". Despite these perspectives, existing research cautions against using grades as punitive measures. Brookhart et al. [14] and Reeves [9] found that using grades to enforce compliance can compromise assessment accuracy and reduce student motivation. Students may perform poorly on assessments they perceive as lacking personal significance [27].

Teachers frequently assessed specific competencies and mastered outcomes, aligning with standards-based grading principles. This approach allows educators to

identify student strengths and areas needing improvement. Tracking employability skills through specific outcomes provides clearer insights into student progress and enables targeted instruction. Feldman [28] argues that separating academic performance from non-academic factors yields more accurate grades. Ultimately, CTE teachers value assessing employability skills but face policy restrictions limiting how these assessments impact grades. While professionalism points and behavior are commonly used, reliance on specific competencies offers a more accurate depiction of student mastery. Integrating standards-based grading could enhance grading accuracy. This has the potential of helping to enhance students' employment prospects.

4.2. Assessment practices and authentic evaluations

Findings related to Research Question Two indicate that Career and Technical Education (CTE) teachers overwhelmingly favor authentic assessments, student-driven projects, and customized teacher-created evaluations as primary assessment methods. Notably, 73% of respondents reported using authentic assessments either extensively or entirely, increasing to more than ninety-three percent when including those who incorporate them "quite a bit". Authentic assessments immerse students in real-world scenarios, requiring them to apply acquired knowledge and technical skills in meaningful, practical contexts. These assessments emphasize problem-solving, critical thinking, and industry-relevant competencies, aligning closely with workforce demands. By prioritizing these approaches, CTE educators reinforce experiential learning, fostering deeper student engagement and readiness for professional environments.

Despite the high reported use of authentic assessments, only 37.4% of teachers used performance quizzes or assessments extensively, highlighting a potential inconsistency in understanding these assessment types. Teachers' comments further emphasized a preference for task-based evaluations over traditional multiple-choice tests. Many criticized standardized assessments like the WebXam for failing to gauge students' practical application of skills. One teacher explained, "The WebXam tests if students know the best choice among options but doesn't measure if they can apply that choice in real-life scenarios". Another respondent added, "Employability skills are best evaluated through real-world conversations, lab projects, and worksite observations—not multiple-choice tests".

Work-based learning emerged as a critical component of employability skill development. CTE teachers recognized its potential for providing authentic, real-world experiences through apprenticeships, internships, and job shadowing. However, they stressed the need for robust assessment frameworks involving regular employer feedback, structured student reflection, and clear performance benchmarks. Teachers suggested that merely participating in work-based learning isn't sufficient; assessment systems must ensure meaningful engagement. When asked to describe their ideal assessment method, CTE teachers overwhelmingly favored real-world performance tasks. Many proposed job-site observations, student-run enterprises, and employer-supervised evaluations. One teacher suggested, "Students should be assessed through real job situations rather than classroom simulations". Another

advocated for "on-the-job observations with input from both employers and instructors". Teachers also expressed interest in using video footage to review students' workplace performance, reflecting a desire for accountability but also hinting at potential trust issues.

Interestingly, while teachers frequently reported using authentic assessments, their descriptions of ideal assessments sometimes contradicted their stated practices. Some appeared to conflate employability points or professionalism grades with authentic assessments, indicating a need for clearer conceptual understanding. Authentic assessments involve demonstrating learning through complex tasks, not merely compliance with classroom rules. Teachers also acknowledged the challenge of translating assessment data into actionable insights. While many agreed that students can pass tests without demonstrating workplace-ready behaviors, few described systematic approaches for using assessment results to guide instruction and remediation. Teachers suggested that deeper data analysis and targeted feedback could help close the employability skills gap.

4.3. Career fields, grading practices, and human capital theory

The findings for Research Question Three indicate that no significant relationship exists between specific career fields and the grading criteria employed by Career and Technical Education (CTE) teachers. While career fields do not appear to directly shape grading practices for employability skills, the relationship between industry characteristics and assessment methods is likely more complex. Factors such as educational prerequisites for entry into a profession, variations in workplace expectations, and CTE educators' perspectives on skill acquisition may indirectly influence how grading is applied across different career pathways. These nuances suggest that grading practices in CTE are shaped by a broader set of influences beyond just career-specific demands.

Human capital theory conceptualizes individuals' learning capacities as resources akin to those utilized in the production of goods and services [1]. This framework emphasizes the significance of investing in human resources—such as skills, knowledge, and health—to generate both personal and societal benefits [1,29–31]. CTE educators play a pivotal role in this developmental process by monitoring student progress in acquiring industry-relevant competencies. Additionally, authentic work-based learning opportunities enhance students' technical proficiency and employability skills, reinforcing the connection between education and workforce readiness [32].

5. Future research

This study contributes to an underexplored area of research by examining how CTE teachers assess student mastery of employability skills. The results highlight inconsistencies in grading approaches, reflecting patterns observed among general education teachers. While career fields do not explicitly dictate grading methodologies, the professional background of educators influences their assessment choices. Given the crucial role of CTE in workforce development, these findings underscore the need for standardized, research-driven grading reforms. Future

studies should further investigate how grading practices align with industry expectations and explore strategies for enhancing the validity and consistency of CTE assessments.

Future research should explore how CTE teachers define and implement professionalism/employability points, as definitions and grading criteria vary widely. Research could also examine how teachers create and use rubrics for assigning these points and their alignment with career field technical content standards. Additionally, expanding research to include both CTE and non-CTE educators could provide a broader perspective on how employability skills instruction influences student readiness for the workforce. Finally, future research could explore employer perspectives on the skills and deficiencies of employed students, providing valuable insights into workforce readiness and training adequacy. Understanding these requirements would enable ongoing adjustments to high school curricula, ensuring alignment with technological advancements, emerging trends, and the evolving demands of the job market.

6. Conclusion

This study highlights the pressing need for reform in CTE grading and assessment practices to ensure alignment with workforce expectations. The findings underscore inconsistencies in grading approaches and the tension between school policies and real-world accountability standards. By implementing evidence-based grading reforms, educators can provide students with more accurate assessments of their employability skills, better preparing them for the workforce. Additionally, increased professional development for CTE teachers in authentic assessment design and data-driven instruction is essential. Future research should further investigate the impact of assessment practices on student workforce readiness and explore best practices for integrating industry standards into CTE curricula. By strengthening grading and assessment systems, CTE programs can play a pivotal role in developing a well-equipped, future-ready workforce.

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