

大學第一年學習成效量表之建構： 以中部私立技專校院新生為例

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摘要

大學第一年經驗（First-Year Experience, FYE）是學生由中等教育轉銜至高等教育的重要階段。學生須同時面對自主學習、專業課程、時間管理、人際互動及校園適應等挑戰，其能否建立學習投入、學校歸屬感與明確學習方向，將影響後續學業表現、能力發展及持續就學。目前大專校院雖普遍推動新生銜接活動、導師制度、UCAN職能診斷、學習預警、補救教學、同儕輔導及自主學習社群，但相關措施多由不同單位分別執行與評估，指標較為分散，難以比較不同學生群體及支持措施的實際成效。若僅以學業成績、滿意度或留校率衡量，亦可能忽略學生在人文、公民、語文、資訊及跨域整合等能力上的發展。

本研究以成果導向教育（Outcome-Based Education,

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OBE) 及學生投入理論、學生整合理論與學生發展理論為基，主張FYE成效不應被簡化為單一學科成績，而應視為學生經歷課程、校園活動及支持制度後，在認知、技能與情意價值上的整體改變。旨在建構具良好信效度的「大學第一年學習成效量表」，並驗證其信度、效度與實際應用價值，進一步分析不同學院與入學管道學生的學習成效差異，並透過質性訪談探討不同高等教育體系新生的轉銜經驗與支持需求。

研究採量化為主、質性為輔之設計。量表初稿依據國內大專校院常用的學生核心能力指標，涵蓋專業知識、資訊科技、整合創新、關懷服務、溝通協調、人文品德、合作能力、實務應用及國際語文等九個向度，共45題，採李克特五點量尺計分。正式施測前，邀請高等教育、教育評量及實務領域專家進行內容效度審查。預試以中部某私立科技大學日間部新生為對象，共發放356份問卷，回收有效問卷304份，有效回收率為85.39%。經決斷值檢定、題項與總分相關分析、信度分析、探索性因素分析及驗證性因素分析，進行題項篩選並確認量表結構。

為驗證量表的實際應用性，正式施測採分層叢集抽樣，以5個學院、17個學系及36個班級為抽樣架構，共發放540份問卷，取得464份有效樣本，有效回收率為86%，再以單因子變異數分析及事後比較檢驗不同學院與入學管道之差異。此外，訪談私立普通大學與私立科技大學新生各7名，共14名，以補充量化分析結果。

研究結果顯示，原九個理論向度經實證分析後，歸納為人文素養、公民素養、語文素養、專業知能、資訊知能及整合知能六個構面，共26題。整體量表Cronbach's α 為.962，

各構面 α 值介於.749至.878；驗證性因素分析結果顯示，RMSEA為.058、IFI為.925、CFI為.923，顯示六構面模型具良好內部一致性、建構效度與結構穩定性。本量表具有良好的信度、建構效度與結構穩定性，可作為評估大學第一年多面向學習成果的工具。

描述統計結果顯示，新生在專業知能與資訊知能的得分相對較高，語文素養與公民素養則相對較低。資訊學院學生在整合知能與資訊知能方面較具優勢，設計學院與管理學院學生則在語文素養與公民素養方面表現相對突出。不同入學管道之分析顯示，申請入學學生在人文、語文或公民素養方面表現較佳，可能與其入學審查重視學習歷程、多元表現及自主學習經驗有關；技優甄審學生則在專業知能上較具有優勢，反映其先前累積的技術與實作經驗有助於專業學習。然而，各項影響效果量偏小，顯示入學前背景雖會造成初始能力的差異，但大學第一年後課程設計、學習投入與學習環境仍可能是影響未來能力發展的重要因素。

質性結果顯示，私立普通大學新生較常面臨自主學習、時間管理及學習策略不足等問題；私立科技大學新生則較易感受到專業課程、證照要求與密集學習預警帶來的壓力。高接觸追蹤制度雖有助於及早辨識學習困難，但若未同步提供補救教學、同儕輔導及心理支持，可能增加學生焦慮並降低學習動機。因此，FYE支持制度具有情境依賴性，學習預警應由「監測學生」轉向「支持學生」，並依校型與學生需求採取差異化設計。

綜上所述，學生學習成效已成為高等教育品質保證與制度問責的重要依據。本研究將FYE學習成效由單一學業指標擴

展為六構面整合性量表，可作為大專校院評估新生支持制度、推動校務研究及落實教學品質保證之實證工具。建議學校分別於入學初期及第一學年結束時進行施測，以掌握新生學習成效的變化，分析不同學院及學生群體的能力表現與發展需求，據以調整課程設計，並提供差異化學習支持，建立「評量、分析、介入、再評量」的持續改善循環。同時，可結合服務學習、跨域專題、國際交流、教學實踐研究及大學社會責任（USR）課程，強化學生的公民素養、語文素養與整合知能。未來研究可擴及不同地區與校型進行跨校驗證，並結合學業成績、課程作品、留生率與畢業流向等客觀資料進行縱貫追蹤，進而提升量表的外部效度與預測效度。

關鍵詞：大學第一年經驗、私立技專校院、高等教育品質保證、學習成效

Development and Validation of a First-Year Learning Outcomes Scale: Evidence From First-Year Students at a Private University of Science and Technology in Central Taiwan

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Abstract

The first-year experience (FYE) represents a critical transition from secondary to higher education. During this period, students must simultaneously adjust to autonomous learning, disciplinary coursework, time management, interpersonal relationships, and campus life. Their ability to develop academic engagement, a sense of belonging, and clear learning goals may affect their subsequent

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academic performance, competency development, and persistence. Although higher education institutions commonly provide orientation programs, faculty advising, UCAN competency assessments, early alert systems, remedial instruction, peer mentoring, and self-directed learning communities, these initiatives are often administered and evaluated separately by different units. Consequently, fragmented evaluation indicators make it difficult to compare the effectiveness of support measures across student groups. Moreover, evaluations based solely on grades, satisfaction, or retention may overlook students' development in humanistic, civic, linguistic, information, and interdisciplinary competencies.

Drawing on outcome-based education (OBE), student engagement theory, student integration theory, and student development theory, this study argues that FYE outcomes should not be reduced to performance in individual academic subjects. Instead, they should reflect students' overall development in knowledge, skills, and affective values through their participation in courses, campus activities, and institutional support programs. This study therefore developed and validated a First-Year Learning Outcomes Scale, examined its reliability, validity, and practical applicability, and compared learning outcomes across colleges and admission pathways. Qualitative interviews were also conducted to explore the transitional experiences and support needs of first-year students in different higher education sectors.

A quantitatively driven mix-methods design was employed.

The initial scale was developed from student competency indicators commonly adopted by higher education institutions in Taiwan. It comprised 45 items across nine proposed dimensions: professional knowledge, information technology, integration and innovation, care and service, communication and coordination, humanistic values and ethics, collaboration, practical application, and international language competency. All items were measured using a five-point Likert scale. Before pilot testing, experts in higher education, educational assessment, and educational practice reviewed the instrument for content validity.

The pilot survey targeted first-year students enrolled in the daytime division of a private university of science and technology in central Taiwan. Of the 356 questionnaires distributed, 304 valid responses were obtained, yielding a valid response rate of 85.39%. Critical-ratio tests, item-total correlation analysis, reliability analysis, exploratory factor analysis, and confirmatory factor analysis were conducted to select items and verify the factor structure.

To examine the scale's practical applicability, the main survey used stratified cluster sampling across five colleges, 17 departments, and 36 classes. Of the 540 questionnaires distributed, 464 valid responses were obtained, representing a valid response rate of approximately 86%. One-way analysis of variance and post hoc comparisons were conducted to examine differences across colleges and admission pathways. In addition, qualitative interviews were conducted with 14 first-year students, seven from

private comprehensive universities and seven from private universities of science and technology—to supplement and contextualize the quantitative findings.

The results indicated that the original nine theoretical dimensions could be empirically consolidated into a 26-item scale comprising six dimensions: humanistic literacy, civic literacy, language literacy, professional competency, information competency, and integrative competency. Cronbach's α was .962 for the overall scale and ranged from .749 to .878 across the six dimensions. Confirmatory factor analysis indicated an acceptable model fit, with an RMSEA of .058, an IFI of .925, and a CFI of .923. These findings demonstrate that the six-factor model has satisfactory internal consistency, construct validity, and structural stability. Accordingly, the scale provides a psychometrically sound instrument for assessing multidimensional learning outcomes during the first year of university.

Descriptive results showed that first-year students reported relatively higher scores in professional and information competencies but lower scores in language and civic literacy. Students in the college of information-related disciplines demonstrated relative strengths in integrative and information competencies, whereas students in the colleges of design and management performed comparatively well in language and civic literacy. Differences were also found across admission pathways. Students admitted through the application-based pathway showed relatively stronger performance in humanistic, language, or civic

literacy, possibly because this admission process emphasizes learning portfolios, diverse accomplishments, and self-directed learning experiences. Students admitted through skills-based selection demonstrated an advantage in professional competency, suggesting that their prior technical training and practical experience facilitated disciplinary learning at university. Nevertheless, the effect sizes were small. Thus, although pre-entry backgrounds may contribute to initial competency differences, curriculum design, student engagement, and the learning environment during the first year remain important factors in subsequent competency development.

The qualitative findings showed that first-year students at private comprehensive universities commonly experienced difficulties with autonomous learning, time management, and learning strategies. In contrast, students at private universities of science and technology were more likely to report pressure arising from professional coursework, certification requirements, and intensive early-alert monitoring. Although high-contact monitoring systems can help identify learning difficulties at an early stage, they may increase anxiety and reduce learning motivation if they are not accompanied by remedial instruction, peer mentoring, and psychological support. These findings indicate that FYE support is context dependent. Early alert systems should therefore shift from “monitoring students” to “supporting students” and adopt differentiated approaches according to institutional type and student needs.

In conclusion, student learning outcomes have become central to quality assurance and institutional accountability in higher education. By expanding the assessment of FYE outcomes from a single academic indicator to an integrated six-dimensional scale, this study provides an empirical instrument for evaluating first-year support programs, advancing institutional research, and strengthening teaching quality assurance. Institutions are advised to administer the scale at university entry and again at the end of the first academic year to identify changes in students' learning outcomes and assess the developmental needs of different colleges and student groups. The findings can inform curriculum revision and differentiated learning support, thereby establishing a continuous improvement cycle of "assessment, analysis, intervention, and reassessment." Institutions may also incorporate service learning, interdisciplinary projects, international exchange, scholarship of teaching and learning initiatives, and university social responsibility courses to strengthen students' civic literacy, language literacy, and integrative competency. Future research should conduct cross-institutional validation across regions and institutional types and use longitudinal designs that incorporate objective indicators, such as academic performance, course artifacts, retention, and graduate outcomes. Such efforts would further establish the scale's external and predictive validity.

Keywords: first-year experience, learning outcomes, higher education quality assurance, private universities of science and technology

