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Appendix Table: Details of the reviewed studies and extracted variable categories

Reference	Research Design	Form and duration of work placement, including full-time/part-time	Sample characteristics; including country data was collected in, discipline, institutional, organizational context; overall N	Variable categories extracted	Summary of results
Cross sectional studies					
Ahmad et al. (2014)	Cross-sectional comparing placement with non-placement group	No information provided	Malaysia, UG; Accounting; N = 631	Career attitudes: career decidedness, professional commitment intention, unconditional commitment, non-commitment	Students who had undergone internship showed sig lower commitment intention (M=4.56) compared to those who had not (M= 4.69), t= 2.260, p= 0.024. Other differences were not significant: self-efficacy, intrinsic interest, extrinsic interest, subjective norms, anticipated conflict, unconditional commitment, non-commitment. Further analysis through multiple regression analyses showed that commitment intention was not predicted by internship.
Brooks & Youngson, (2016)	Cross-sectional, comparing placement with non-placement group	One-year placement as part of sandwich degree	UK, various disciplines including Art and Design, Business studies, Mathematics, Engineering, Physical Sciences, Biological Sciences, N = 1475	Objective career outcomes; academic achievement, employment outcome, salary	Placement students improved mean grades, non-placement students did not (difference statistically significant). Placement students 50% more likely to obtain graduate level job and more likely to be in fulltime employment; salaries higher for placement students.
Callanan & Benzing (2004)	Cross-sectional, comparing placement with non-placement	Part time placement	US; final year UG; N = 88	Objective and subjective career outcomes:	Internship students were 4.43 times more likely to have secured a job than non-internship students (also when controlling for number of job

	group			Employment outcome and perceived fit	interviews). Internship students were not more likely to have interviews, or have more confidence in fit with the job.
Green (2011)	Cross-sectional, comparing placement with non-placement group	One -ear FT	UK; UG; Business Studies; N = 32	Academic achievement	Placement students had significantly higher final degree marks (but didn't have higher tariff points on entry); for placement students improvements in average grads also translated into likelihood of higher degree classification; regression analysis (note small N) showed that performance in placement year added explanatory power
Hauck et al. (2000)	Cross-sectional, comparing placement with non-placement group	Structured Internship; 12 weeks	US; UG; Construction Management; N = 60	Knowledge, skills and competencies; academic achievement, subject specific knowledge	No significant difference in overall GPA for placement students (pre and post internship, changes in GPA), so no support for placements improving academic performance
Hayward & Horvath (2000)	Cross-sectional, comparing placement with non-placement group	Cooperative education, 3-4 FT placements as part of study for about four months each	Canada, UG; mainly Computer Science; N = 79	Career attitudes (here beliefs), academic achievement	Focuses on work beliefs while students are on the programme, comparing those in early stages of the programme to those in later stages of the program; significant main effect for by programme comparison on work beliefs. Mean CGPA scores of the coop group were slightly higher; sig
Lucas et al. (2009)	Cross-sectional, comparing placement, work experience and no-work experience students	Sandwich placement, summer placement, part time work, work in parental business (comparison)	UK, UG, Engineering; N = 400	(subject specific) self-efficacy, self-esteem, confidence	Both sandwich and summer placements were not significantly associated with venturing and technology self-efficacy. Further results show that aspects of the placement (e.g. job rotation, difficulty of work) linked self-efficacy. Overall, results show that work experience per se not linked to higher self-efficacy as contingent on the features of the placement.
Mansfield (2011)	Cross-sectional using archival data comparing placement with non-placement group	Sandwich degree with placement year	UK, UK, Property related degree program, N = 336	Academic achievement	Participation in placements was linked to higher academic achievement in year 3, controlling for marks in year 2. Study points to extreme variability in academic performance in year 3, suggesting that not every student improves performance as a result of a placement (comparison by gender based on small ns)
McCormick (2013)	Cross-sectional comparing placement	Internship and cooperative	US, range of programs including Engineering	(subject specific) self-efficacy, self-esteem,	Internship/ coop experience appeared related to higher self-efficacy (but no correlations reported)

	and non-placement group	education	and Architecture; N = 194	confidence; attitudes towards work/ placement/ subject	
Smith-Eggeman & Scott (1994)	Cross-sectional comparing placement with non-placement group	Cooperative Education	US (?), UG, N = 124, age range 18-24	Knowledge, skills and competencies: tolerance of others and relationship skills	Coops and non coops differed significantly in their Tolerance skills (but not significantly in their reported Quality of Relationships)
Yung, Lam & Yu (2015)	Cross-sectional archival study, comparing placement with non-placement group	One-year FT placement during Sandwich Degree	UK, UG, Quantity Surveying and Construction Management, N = 64	Academic achievement	Doing a placement significantly predicted Level 3 results, students with placement had better GPA
Longitudinal					
Arnold et al. (1995)	Longitudinal comparing two cohorts across three measurement times	Sandwich placement (1 year FT as part of degree program)	UK; UG; Psychology Mean age 19 years; N = 65	Career attitudes (here decidedness); self-efficacy, self-esteem, confidence; knowledge, skills and competencies; work experience and job design work	There were no effects of placements on self-esteem and career-decidedness (compared to control group) but the quality of placements mattered: more autonomy equaled more self-esteem and self-rated abilities at time 3; overall small effects
Auburn et al. Arnold (1993)	Longitudinal comparing placement and non-placement students	Sandwich placement (One-year FT as part of degree program)	UK; UG; N = 187 (at time 1) mean age 22 years	Knowledge, skills and competencies (work experience, perceived importance of abilities to perform task); career attitudes (decidedness)	No benefits for academic study from participation in placements (students found they could not use their skills); career decidedness develops over time so control group crucial. Placements rate different skills as important and they had positive after effects for employment – the students went on to like their employment more.
Basow & Byrne (1993)	Longitudinal pre and post placement	No information available, other than ‘internship’ appears short term, of 14 days or less, or 15 days or more	Journalism, N = 63,	self-efficacy, self-esteem, confidence; career attitudes; subjective career outcomes	There were decreased attitudes for self-esteem, educational preparedness and career insight after placements. Decrease in attitudes over internship duration stresses need to set accurate expectations about what placement can and can’t deliver; might act as realistic job preview; internship supervision seems vital component
Bates et al. (2013)	Longitudinal pre and post placement	Elective work-integrated learning, 1 one semester-long	Australia, UG; Criminology; N = 22; mean age 23 years	self-efficacy (general and specific), self-esteem, confidence	Post placement changes observed in self-efficacy related to work-focused problem solving, politics, working under pressure and role expectations.

		placement			
Craig & Oja (2013)	Longitudinal pre and post placement	One semester (14 weeks) FT	USA, UG recreation management; N = 33	Knowledge, skills and competencies: moral judgment and reasoning	There were significant effects of internship on moral reasoning; decrease in personal interest schema, increase in post conventional schema.
Crawford & Wang (2015)	Longitudinal using archival records from four cohorts of students	Fulltime as part of sandwich degree	Business, Accounting and Finance, N = 134	Academic achievement	UK sandwich degree students performed significantly better than FT students in final year controlling for prior academic achievement; results for Chinese students inconclusive (but small numbers); self-selection effect as placement students outperform FT students academically prior to placement
Feldman & Weitz (1990)	Longitudinal pre and post placement	10 – 12 week summer internship organized for field of study (for study credit)	US, Business studies; N = 72	Attitudes towards work/ placement/ subject; generic work attitudes and values; career attitudes (commitment, career beliefs)	Student interns with realistic and positive job expectations had more positive internship attitudes and attitudes towards retailing (“anticipatory socialization”); intrinsic motivation also had a positive effect
Gardner et al. (1992)	Longitudinal study, observing changes in salary over time	Cooperative education, 10 weeks each	USA, UG, N = 1037, Junior year of University	Objective career outcomes (salary); academic achievement	There was a significant effect of coop placement on starting salary, especially for those who signed up with their coop employer (but only 35% do). There seems to exist an optimum number of coops - the more often an student does a coop with a certain organisation, the more they are viewed as a regular employee and evaluated differently (which does not always result in positive effects on their starting salary)
Gilbert et al. (2014)	Longitudinal, following interns in a year across three times of measurement	Internship, 10 hours per week	US, UG, Life or Health sciences, N = 44	Knowledge, skills and competencies: research skills and abilities	Internship students showed significant improvements in application of classroom knowledge, use of methodology, proficiency of practice; communication; notable that mentor ratings were consistently higher than self-evaluations
Green & Farazmand (2012)	Longitudinal for applied project perceptions and experiences	Internships for set number of hours (15); PT, completed	US, UG, marketing; N = 55	Knowledge, skills and competencies: also personal development	Students with internship experience had better (perceived) learning outcomes (applied learning skills and benefits for career goals) compared to

		during junior year or first semester senior year			students with no internship experience in the live-case project. Although mean grades of internship students were higher, this difference was not significant.
Iqbal (2007)	Longitudinal: comparison before and after placement in placement and non-placement students	Cooperative Education; 16 months, FT; alternating between work and study terms	Canada, UG, Pharmacology; N = 56	Academic achievement	Placement students improved their grades, while non-placement students did slightly worse (opposite to the expectation that placement students would do worse having been out of education). These (within-group) differences are not statistically significant however
Kilgo et al. (2015)	Longitudinal large scale survey across several years including placement and non-placement students	Internship	US, UG, appr. N = 1,400 (not explicitly stated)	Knowledge, skills and competencies (leadership, moral); academic achievement	Varied results, as internship participation had positive effects on need for cognition, intercultural effectiveness and leadership responsibility, no effect on critical thinking, moral reasoning, positive attitude towards literacy and other aspects of intercultural effectiveness
Moore & Reddy (2012)	Cross-sectional comparing placement with non-placement group	Potentially Sandwich Degree (not explicit); FT	UK, UG, psychology and other subjects; varied N across 3 times points; last point N = 122	Objective and subjective career outcomes: Employment outcome, type of employment, salary, career success, career satisfaction, career schedule, fit, change in career goals	Varied results; non-psychology placement students had more work activity following graduates, and more appropriate jobs, placement students earned more. For psychology students, also significant association between placement undertaken and graduate job level; placement students were more satisfied with their career and perceived career schedule.
Murphy et al. (1999)	Cross-sectional comparing placement with non-placement group	Cooperative Education, FT during work experience components	Canada, UG, Business administration and Tourism/ hospitality management, N = 120	Knowledge, skills and competencies (cognitive style); academic achievement	Coop students were significantly more analytical than non-Coop students; no gender differences or differences between number of work terms completed.
Nunley et al. (2015)	Experimental study	Three months	US; various degree subjects including accounting, history, management, psychology; N = 2335	Objective career outcomes: Invitation to job interview	Applicants with internship experience were more likely to be asked to employment interview, the effect is greater for non-business degrees.
Park (2015)	Cross-sectional comparing placement with non-placement	Not stated	Korea, UG, Engineering; N = 4176	Objective career outcomes: Type of employment	Internship experience had a positive outcome on employment, preferred job employment, and employment at the top 500 companies by

	group				increasing the probability that the employment outcomes occur
Rathbun-Gubb (2016)	Analysis of large scale survey data comparing placement with non-placement group	Internship	US, Canada; Masers; Library and Information Systems; n = 2581	Objective career outcomes: Length of time to secure employment after graduation, management or leadership, professional activities	Internship completers were significantly more likely to secure employment within three months of graduation or first application, be a member of a professional association, mentor students, actively participate in an online professional discussion group, win a grant, collaborate with other professionals, and attend, organize, and present at conferences. They also had higher than average rates of participation in professional and leadership activities.
Rowe (1992)	Cross-sectional cohort study (two cohorts) comparing placement with non-placement group	Cooperative education	Canada, UG, Arts, N = 92	Objective & subjective career outcomes; attitudes towards work/ placement/ subject: Job satisfaction, salary, job involvement, organizational commitment, attitudes towards aspects of the work	Significant differences where non-coop students more likely to aim to pursue further education; coop student salaries were higher, and they had higher attitudes towards program (more likely to think it satisfied learner needs); no differences for satisfaction with pay, job satisfaction, organizational commitment, work involvement.
Santer (2010)	Cross-sectional using archival data across several cohorts, comparing placement with non-placement group	Fulltime, appears to be sandwich program (professional training year = PTY), as 9-12 months in duration	UK, UG, Neuroscience, N = 217	Academic achievement	PTY had significantly higher final degree marks, were more likely to have 1st class degrees and also for certain modules PTY had significantly higher core module marks and were more likely to progress to doctoral level study
Scholz et al. (2004)	Longitudinal pre and post survey, two sources of evaluation	Professional Internship, 1 semester	Switzerland, Environmental Natural Sciences, n = 478	Self-efficacy, self-esteem, confidence: Change in perceived qualification	Students rated the value of their qualification especially with regard to general abilities and key qualifications lower after their placement. But nevertheless they reported that the internship will enhance these qualifications and judge that it does.
Siedenberg (1990)	Longitudinal study [but comparing post-test scores between groups]	Cooperative Education,	US, Public & Liberal Arts, N = 403	Objective career outcomes: salary	No difference between graduate wage rates of coop/non coop students. There were significant differences on college wage rates (favouring non coops). Significant (but very small) differences on

					wage gain after graduation (favouring coops slightly)
Simons et al. (2012)	Longitudinal pre and post placement	Practicum, 100 or 200 hours	US, UG, mean age 22	Knowledge, skills and competencies: Civic attitudes, leadership skills, attitudes towards ethnic groups and racism	There was an increase in multicultural skills; Differences in reactions and racism attitudes between practicum and non-practicum students, vary by length and type of placement
Tanaka & Carlson (2012)	Longitudinal panel study with two different samples	Work-integrated learning; average number of placements 2.1	Japan, China; UG; N varied from 1216 to 1705	Academic achievement	For Japanese cohort, effect of doing work-integrated learning on final year GPA for two out of three cohorts; no overall effect for Chinese students on overall learning context, but positive effect on overall GPA.
Taylor and Hooley (2014)	used longitudinal data from existing survey	1 year fulltime	UK, UG, business degrees	Objective career outcomes: employment outcomes	Taking a preparation module made a difference to employment outcomes, add on value of placement only 9% for employment in general; however the differences were larger for level of employment.
Van Gyn, Cutt, Loken, and Ricks (1997)	Longitudinal study, comparing post-test scores between groups	Cooperative Education	Canada, n = 117 UG students across Arts, Engineering, Science	Knowledge, skills and competencies: Subject specific knowledge	Post the co-op experience this group exhibited better problem solving and functioning in institutions.
Walo (2001)	Longitudinal pre and post placement	Internship, six months	Australia, UG, 19-23 years; N = 84 (across two waves)	Knowledge, skills and competencies: leadership	Six of 24 managerial competencies were higher post internship than pre internship: organising, controlling, reducing information overload, presenting information: writing effectively, managing change and presenting ideas. Three out of eight managerial roles were higher: coordinator, monitor, broker roles
Wessels & Pumphrey (1995)	Cross-sectional comparing placement with non-placement group	Cooperative Education	US, overall N = 1408	Objective career outcomes: Employment outcomes, commitment, job advancement	Coop students were more likely to find an appropriate job where their skills are used appropriately, and likely to get first job with coop employer. Being at a college offering a co-op programme (regardless of whether actually being registered or that programme) benefited time spent finding a job (potentially because these colleges have a big network of prospective employers)
Wessels & Pumphrey (1996)	Cross-sectional comparing placement	Cooperative Education,	US, Technical programs, overall N =	Objective career outcomes: Salary	Hourly wage 5 years after graduation depended on other factors than co-op status. Taking gender and

	with non-placement group		1408		labour force experience into account alters results: females with less labour force experience benefited from taking a co-op programme . Results indicate a small institutional effect: Graduates from colleges offering co-op appeared to earn higher wages (regardless of taking the co-op programme or not)
Williams et al. (1993)	Cross-sectional comparing placement with non-placement group	Cooperative Education, placements ranged from 3.9 months to 5.5, FT	US, engineering, N = 68, average age 23	Knowledge, skills and competencies: tacit knowledge	There were no significant differences if both placement groups are combined and compared to controls; only in tacit knowledge action (related to knowlegde of business environments, challenge orientation and personal effectiveness in context). Non placement students were more motivated. If placements are regarded separately, then differences between controls and placements are found, indicates the nature of the placement matters which differed on pay, hrs worked, frequency and helpfulness of feedback, as well as how many coops a manager had to supervise.