**Credibility-Building Graduate - Database Schema Mermaid ER Diagram**

**Complete Entity Relationship Diagram**

erDiagram  
 %% Core Graduate Profile & Academic Management  
 graduate\_profiles {  
 uuid profile\_id PK  
 uuid user\_id UK  
 varchar full\_name  
 varchar academic\_email  
 varchar student\_id  
 varchar orcid\_id  
 varchar institution\_name  
 varchar department  
 graduate\_program\_type graduate\_program  
 date program\_start\_date  
 date expected\_completion\_date  
 varchar advisor\_name  
 text committee\_members  
 academic\_objective primary\_objectives  
 research\_domain research\_domains  
 text dissertation\_topic  
 jsonb research\_interests  
 varchar undergraduate\_institution  
 decimal undergraduate\_gpa  
 jsonb previous\_degrees  
 jsonb academic\_awards  
 credibility\_stage current\_credibility\_stage  
 integer h\_index  
 integer citation\_count  
 integer publication\_count  
 integer conference\_presentations  
 research\_methodology research\_methodology\_expertise  
 jsonb technical\_skills  
 integer academic\_writing\_level  
 integer statistical\_analysis\_level  
 integer weekly\_study\_hours  
 integer research\_hours\_per\_week  
 integer coursework\_hours\_per\_week  
 jsonb preferred\_study\_schedule  
 text professional\_memberships  
 jsonb conference\_attendance\_history  
 jsonb academic\_social\_media  
 collaboration\_type collaboration\_preferences  
 varchar post\_graduation\_plans  
 varchar target\_job\_market  
 integer networking\_goals  
 integer publication\_goals  
 integer average\_study\_session\_duration  
 integer deep\_work\_capacity  
 integer procrastination\_tendency  
 integer academic\_confidence  
 varchar thesis\_proposal\_status  
 decimal thesis\_progress\_percentage  
 integer chapters\_completed  
 integer total\_planned\_chapters  
 date defense\_date  
 integer papers\_in\_progress  
 integer manuscripts\_submitted  
 integer papers\_under\_review  
 integer accepted\_publications  
 timestamptz last\_login  
 decimal total\_study\_hours  
 integer courses\_completed  
 integer research\_projects\_active  
 timestamptz created\_at  
 timestamptz updated\_at  
 }  
  
 academic\_skills {  
 uuid skill\_id PK  
 varchar skill\_code UK  
 varchar skill\_name  
 text description  
 research\_domain research\_domain  
 varchar skill\_category  
 academic\_complexity academic\_level  
 text prerequisite\_knowledge  
 integer typical\_mastery\_time\_weeks  
 uuid prerequisite\_skills  
 jsonb advanced\_applications  
 integer academic\_importance  
 integer industry\_relevance  
 integer research\_applicability  
 integer publication\_value  
 boolean requires\_deep\_focus  
 boolean collaborative\_learning\_suitable  
 boolean practical\_application\_heavy  
 boolean theoretical\_foundation\_required  
 jsonb leading\_researchers  
 jsonb essential\_papers  
 jsonb key\_conferences  
 jsonb industry\_applications  
 jsonb certification\_opportunities  
 integer thought\_leadership\_potential  
 integer networking\_value  
 timestamptz created\_at  
 timestamptz updated\_at  
 }  
  
 research\_projects {  
 uuid project\_id PK  
 uuid user\_id  
 varchar project\_title  
 varchar project\_type  
 research\_domain research\_domain  
 research\_methodology methodology  
 text project\_description  
 jsonb research\_questions  
 jsonb objectives  
 jsonb expected\_outcomes  
 date start\_date  
 date expected\_completion\_date  
 date actual\_completion\_date  
 research\_phase current\_phase  
 jsonb phase\_deadlines  
 uuid primary\_advisor\_id  
 uuid committee\_members  
 uuid collaborators  
 jsonb external\_partners  
 uuid required\_skills  
 jsonb datasets\_required  
 jsonb equipment\_needed  
 decimal budget\_requirements  
 date proposal\_approval\_date  
 boolean ethics\_approval\_required  
 date ethics\_approval\_date  
 varchar institutional\_review\_status  
 decimal progress\_percentage  
 decimal literature\_review\_completion  
 decimal methodology\_development\_completion  
 decimal data\_collection\_completion  
 decimal analysis\_completion  
 decimal writing\_completion  
 integer publications\_planned  
 integer publications\_generated  
 integer conference\_presentations\_planned  
 integer conference\_presentations\_given  
 integer potential\_citations  
 integer academic\_significance  
 integer industry\_impact  
 integer social\_impact  
 jsonb challenges\_encountered  
 jsonb support\_needed  
 jsonb resources\_utilized  
 jsonb lessons\_learned  
 jsonb peer\_review\_feedback  
 jsonb advisor\_feedback  
 jsonb self\_assessment  
 timestamptz created\_at  
 timestamptz updated\_at  
 }  
  
 academic\_publications {  
 uuid publication\_id PK  
 uuid user\_id  
 uuid project\_id FK  
 varchar title  
 publication\_type publication\_type  
 text abstract  
 text keywords  
 integer author\_position  
 jsonb co\_authors  
 boolean corresponding\_author  
 boolean student\_first\_author  
 varchar venue\_name  
 varchar venue\_type  
 varchar venue\_ranking  
 decimal venue\_impact\_factor  
 decimal venue\_acceptance\_rate  
 date first\_draft\_date  
 date submission\_date  
 date review\_completion\_date  
 date acceptance\_date  
 date publication\_date  
 integer revision\_rounds  
 integer citation\_count  
 integer download\_count  
 integer altmetric\_score  
 integer media\_mentions  
 decimal peer\_review\_score  
 integer significance\_rating  
 integer methodological\_rigor  
 integer clarity\_and\_writing  
 integer novelty\_score  
 integer practical\_impact  
 integer theoretical\_contribution  
 varchar publication\_status  
 boolean open\_access  
 varchar doi  
 text url  
 text preprint\_url  
 jsonb awards\_received  
 jsonb invited\_presentations  
 jsonb media\_coverage  
 boolean dataset\_available  
 boolean code\_available  
 jsonb reproducibility\_materials  
 timestamptz created\_at  
 timestamptz updated\_at  
 }  
  
 conference\_participation {  
 uuid participation\_id PK  
 uuid user\_id  
 uuid publication\_id FK  
 varchar conference\_name  
 varchar conference\_acronym  
 integer conference\_year  
 varchar location  
 daterange conference\_dates  
 varchar conference\_ranking  
 decimal acceptance\_rate  
 integer attendee\_count  
 boolean international\_scope  
 varchar participation\_type  
 varchar presentation\_type  
 varchar presentation\_title  
 text presentation\_abstract  
 integer networking\_contacts\_made  
 integer follow\_up\_collaborations  
 boolean media\_attention\_received  
 boolean best\_paper\_nomination  
 jsonb feedback\_received  
 jsonb questions\_and\_discussions  
 jsonb future\_collaboration\_opportunities  
 jsonb career\_advancement\_impact  
 integer presentation\_confidence\_rating  
 integer networking\_success\_rating  
 integer learning\_value\_rating  
 boolean invited\_to\_present  
 boolean session\_chair\_role  
 boolean program\_committee\_member  
 boolean keynote\_speaker  
 timestamptz created\_at  
 timestamptz updated\_at  
 }  
  
 %% Graduate Curriculum Structure  
 graduate\_curricula {  
 uuid curriculum\_id PK  
 varchar curriculum\_code UK  
 varchar title  
 text description  
 graduate\_program\_type program\_types  
 research\_domain target\_research\_domains  
 academic\_complexity academic\_level  
 text prerequisites  
 integer total\_duration\_weeks  
 integer credit\_hours  
 integer weekly\_time\_commitment  
 integer deep\_work\_sessions\_per\_week  
 decimal research\_component\_percentage  
 decimal theoretical\_foundation\_emphasis  
 integer practical\_application\_level  
 integer academic\_writing\_intensity  
 boolean peer\_review\_component  
 boolean original\_research\_required  
 boolean publication\_expectation  
 integer expected\_skill\_mastery\_level  
 boolean research\_competency\_development  
 boolean critical\_thinking\_emphasis  
 boolean methodology\_mastery\_required  
 integer conference\_presentation\_opportunities  
 jsonb publication\_pathways  
 integer networking\_events  
 jsonb mentorship\_structure  
 boolean cohort\_based\_learning  
 boolean international\_collaboration  
 boolean industry\_partnership  
 boolean interdisciplinary\_focus  
 boolean formative\_assessment\_emphasis  
 boolean peer\_evaluation\_component  
 boolean self\_reflection\_requirements  
 boolean portfolio\_development  
 decimal completion\_rate  
 decimal average\_gpa  
 decimal publication\_success\_rate  
 decimal career\_placement\_rate  
 varchar version  
 varchar accreditation\_status  
 date last\_curriculum\_review  
 timestamptz created\_at  
 timestamptz updated\_at  
 uuid created\_by  
 }  
  
 graduate\_modules {  
 uuid module\_id PK  
 uuid curriculum\_id FK  
 varchar module\_code  
 varchar title  
 text description  
 integer module\_number  
 integer duration\_weeks  
 integer credit\_hours  
 uuid prerequisite\_modules  
 jsonb learning\_objectives  
 uuid research\_skills\_developed  
 jsonb theoretical\_concepts  
 jsonb practical\_applications  
 jsonb required\_readings  
 jsonb supplementary\_resources  
 jsonb primary\_sources  
 jsonb current\_research  
 integer writing\_assignments  
 integer research\_components  
 jsonb critical\_analysis\_requirements  
 varchar literature\_review\_scope  
 jsonb major\_assessment\_types  
 boolean peer\_review\_requirements  
 integer presentation\_requirements  
 jsonb portfolio\_contributions  
 integer seminar\_discussions  
 integer group\_projects  
 jsonb peer\_collaboration\_opportunities  
 integer expert\_guest\_lectures  
 jsonb industry\_connections  
 jsonb research\_lab\_involvement  
 jsonb conference\_relevance  
 jsonb publication\_opportunities  
 integer difficulty\_rating  
 jsonb support\_resources  
 integer office\_hours\_recommendation  
 integer order\_index  
 boolean is\_core\_module  
 boolean elective\_alternative  
 timestamptz created\_at  
 timestamptz updated\_at  
 }  
  
 graduate\_components {  
 uuid component\_id PK  
 uuid module\_id FK  
 varchar component\_code  
 varchar title  
 text description  
 decimal component\_number  
 integer estimated\_study\_hours  
 academic\_complexity academic\_complexity  
 integer theoretical\_depth\_required  
 integer practical\_application\_level  
 integer research\_methodology\_emphasis  
 integer critical\_thinking\_requirement  
 jsonb key\_concepts  
 jsonb theoretical\_frameworks  
 jsonb research\_methods  
 jsonb case\_studies  
 jsonb essential\_readings  
 jsonb research\_papers  
 jsonb seminal\_works  
 jsonb contemporary\_research  
 jsonb analytical\_skills\_developed  
 jsonb research\_techniques  
 jsonb academic\_writing\_skills  
 jsonb presentation\_skills  
 jsonb formative\_assessments  
 jsonb summative\_assessments  
 boolean peer\_evaluation\_component  
 jsonb self\_assessment\_requirements  
 integer career\_relevance  
 jsonb industry\_connections  
 jsonb academic\_career\_preparation  
 jsonb discussion\_topics  
 jsonb group\_work\_requirements  
 jsonb peer\_learning\_opportunities  
 integer order\_index  
 boolean is\_optional  
 timestamptz created\_at  
 timestamptz updated\_at  
 }  
  
 graduate\_topics {  
 uuid topic\_id PK  
 uuid component\_id FK  
 varchar topic\_code  
 varchar title  
 text description  
 integer estimated\_study\_hours  
 integer academic\_depth\_level  
 integer research\_application\_potential  
 jsonb learning\_outcomes  
 jsonb cognitive\_skills\_developed  
 jsonb research\_applications  
 jsonb theoretical\_foundations  
 jsonb empirical\_evidence  
 jsonb controversies\_and\_debates  
 jsonb future\_research\_directions  
 jsonb required\_preparation  
 jsonb discussion\_questions  
 jsonb critical\_analysis\_prompts  
 jsonb synthesis\_opportunities  
 jsonb applicable\_methods  
 jsonb data\_analysis\_techniques  
 jsonb ethical\_considerations  
 jsonb knowledge\_assessment\_methods  
 jsonb application\_assessments  
 jsonb creative\_synthesis\_tasks  
 integer academic\_career\_relevance  
 jsonb industry\_applications  
 jsonb interdisciplinary\_connections  
 integer order\_index  
 uuid prerequisite\_topics  
 timestamptz created\_at  
 timestamptz updated\_at  
 }  
  
 graduate\_learning\_units {  
 uuid unit\_id PK  
 uuid topic\_id FK  
 varchar unit\_code  
 varchar title  
 text description  
 integer estimated\_study\_hours  
 integer complexity\_rating  
 jsonb prerequisite\_knowledge  
 text learning\_objective  
 jsonb academic\_skills\_developed  
 text research\_relevance  
 integer theoretical\_content\_depth  
 boolean empirical\_evidence\_integration  
 jsonb methodological\_focus  
 boolean critical\_evaluation\_required  
 jsonb primary\_sources  
 jsonb supplementary\_readings  
 jsonb multimedia\_resources  
 jsonb discussion\_preparation  
 jsonb reflection\_prompts  
 jsonb synthesis\_activities  
 jsonb application\_exercises  
 jsonb writing\_skills\_emphasis  
 jsonb research\_skills\_practice  
 jsonb critical\_thinking\_exercises  
 jsonb formative\_assessment\_opportunities  
 jsonb peer\_learning\_components  
 jsonb self\_evaluation\_criteria  
 jsonb career\_applications  
 jsonb academic\_networking\_opportunities  
 jsonb conference\_relevance  
 integer order\_index  
 boolean is\_optional  
 boolean requires\_prerequisite\_completion  
 timestamptz created\_at  
 timestamptz updated\_at  
 }  
  
 %% Graduate Content Management  
 graduate\_content {  
 uuid content\_id PK  
 uuid unit\_id FK  
 varchar external\_id UK  
 varchar title  
 text description  
 varchar content\_type  
 varchar academic\_format  
 text content\_markdown  
 text content\_html  
 jsonb content\_json  
 jsonb academic\_citations  
 jsonb bibliography  
 academic\_complexity academic\_level  
 integer theoretical\_depth  
 integer empirical\_support  
 integer methodological\_rigor  
 research\_domain research\_domain  
 research\_methodology methodology\_focus  
 jsonb key\_researchers  
 jsonb foundational\_works  
 jsonb learning\_objectives  
 jsonb prerequisite\_knowledge  
 integer estimated\_study\_time  
 integer cognitive\_load  
 jsonb critical\_questions  
 jsonb discussion\_prompts  
 jsonb reflection\_exercises  
 jsonb synthesis\_opportunities  
 jsonb research\_applications  
 jsonb methodology\_examples  
 jsonb ethical\_considerations  
 jsonb data\_analysis\_connections  
 jsonb writing\_style\_examples  
 jsonb presentation\_guidelines  
 jsonb citation\_examples  
 jsonb peer\_review\_criteria  
 varchar peer\_review\_status  
 boolean academic\_expert\_validation  
 decimal content\_accuracy\_score  
 decimal scholarly\_rigor\_rating  
 jsonb engagement\_metrics  
 jsonb comprehension\_indicators  
 decimal application\_success\_rate  
 text keywords  
 varchar academic\_tags  
 uuid skill\_tags  
 varchar research\_tags  
 varchar theory\_tags  
 date last\_academic\_review  
 integer research\_currency\_score  
 boolean needs\_updating  
 integer update\_priority  
 timestamptz created\_at  
 timestamptz updated\_at  
 uuid created\_by  
 }  
  
 academic\_case\_studies {  
 uuid case\_study\_id PK  
 uuid content\_id FK  
 varchar case\_title  
 research\_domain research\_domain  
 research\_methodology methodology\_demonstrated  
 academic\_complexity complexity\_level  
 jsonb theoretical\_framework  
 jsonb literature\_context  
 jsonb research\_questions  
 text background\_information  
 text problem\_statement  
 text methodology\_description  
 jsonb data\_collection\_methods  
 jsonb analysis\_approaches  
 jsonb findings  
 jsonb implications  
 jsonb limitations  
 jsonb future\_research  
 jsonb learning\_objectives  
 jsonb critical\_analysis\_questions  
 jsonb discussion\_topics  
 jsonb alternative\_approaches  
 jsonb peer\_review\_comments  
 jsonb methodological\_strengths  
 jsonb areas\_for\_improvement  
 integer career\_relevance  
 jsonb industry\_applications  
 jsonb academic\_career\_preparation  
 jsonb original\_publication  
 jsonb key\_citations  
 jsonb related\_case\_studies  
 timestamptz created\_at  
 timestamptz updated\_at  
 }  
  
 academic\_resources {  
 uuid resource\_id PK  
 uuid content\_id FK  
 varchar resource\_title  
 varchar resource\_type  
 varchar academic\_category  
 research\_domain research\_domain  
 academic\_complexity academic\_level  
 jsonb theoretical\_orientation  
 text resource\_description  
 text abstract  
 jsonb key\_concepts  
 jsonb learning\_value  
 text full\_citation  
 varchar doi  
 varchar isbn  
 integer publication\_year  
 varchar journal\_name  
 varchar conference\_name  
 jsonb authors  
 jsonb institutions  
 jsonb corresponding\_author  
 boolean peer\_reviewed  
 decimal impact\_factor  
 integer citation\_count  
 integer academic\_reputation  
 boolean open\_access  
 boolean institutional\_access  
 text url  
 varchar library\_location  
 integer reading\_difficulty  
 integer estimated\_reading\_time  
 jsonb prerequisite\_knowledge  
 jsonb follow\_up\_resources  
 jsonb course\_applications  
 jsonb research\_applications  
 jsonb methodology\_demonstrations  
 varchar academic\_review\_status  
 boolean faculty\_recommendation  
 decimal student\_rating  
 integer usage\_frequency  
 timestamptz created\_at  
 timestamptz updated\_at  
 }  
  
 %% Graduate AI Avatar System  
 graduate\_ai\_avatars {  
 uuid avatar\_id PK  
 varchar avatar\_name UK  
 varchar display\_name  
 text description  
 graduate\_avatar\_role primary\_role  
 research\_domain research\_domains  
 academic\_complexity academic\_expertise  
 jsonb simulated\_academic\_background  
 integer years\_of\_academic\_experience  
 integer research\_publications  
 integer successful\_students\_mentored  
 boolean can\_guide\_thesis\_writing  
 boolean can\_provide\_methodology\_advice  
 boolean can\_review\_academic\_writing  
 boolean can\_suggest\_research\_directions  
 boolean can\_provide\_career\_guidance  
 boolean can\_facilitate\_peer\_review  
 integer academic\_formality\_level  
 varchar encouragement\_style  
 varchar feedback\_approach  
 text mentorship\_philosophy  
 varchar research\_guidance\_style  
 varchar writing\_feedback\_focus  
 boolean networking\_facilitation  
 boolean conference\_preparation\_support  
 boolean publication\_strategy\_guidance  
 boolean academic\_career\_counseling  
 jsonb theoretical\_frameworks\_expertise  
 jsonb methodology\_expertise  
 jsonb statistical\_analysis\_capabilities  
 jsonb academic\_writing\_specializations  
 boolean is\_active  
 varchar version  
 date last\_knowledge\_update  
 timestamptz created\_at  
 timestamptz updated\_at  
 }  
  
 graduate\_avatar\_content {  
 uuid variation\_id PK  
 uuid content\_id FK  
 uuid avatar\_id FK  
 text theoretical\_perspective  
 jsonb methodology\_emphasis  
 text critical\_analysis\_approach  
 jsonb research\_applications  
 jsonb thesis\_integration\_suggestions  
 jsonb publication\_potential\_assessment  
 text scholarly\_tone\_adaptation  
 jsonb discussion\_facilitation  
 jsonb peer\_review\_guidance  
 jsonb skill\_development\_roadmap  
 jsonb research\_milestone\_guidance  
 jsonb academic\_networking\_advice  
 jsonb thesis\_writing\_support  
 jsonb literature\_review\_strategy  
 jsonb methodology\_selection\_criteria  
 jsonb academic\_job\_market\_preparation  
 jsonb industry\_transition\_advice  
 jsonb conference\_presentation\_tips  
 timestamptz created\_at  
 }  
  
 %% Graduate Assessment System  
 graduate\_assessments {  
 uuid assessment\_id PK  
 uuid unit\_id FK  
 varchar assessment\_code  
 varchar title  
 text description  
 varchar assessment\_type  
 integer academic\_rigor\_level  
 boolean research\_component\_required  
 integer estimated\_completion\_hours  
 integer preparation\_time\_hours  
 boolean deadline\_flexibility  
 integer total\_possible\_points  
 integer minimum\_passing\_score  
 decimal theoretical\_understanding\_weight  
 decimal methodology\_application\_weight  
 decimal critical\_analysis\_weight  
 decimal academic\_writing\_weight  
 boolean original\_thinking\_required  
 boolean peer\_review\_component  
 boolean presentation\_component  
 boolean collaboration\_component  
 jsonb citation\_requirements  
 jsonb writing\_style\_requirements  
 jsonb length\_requirements  
 jsonb formatting\_standards  
 text instructions  
 jsonb grading\_rubric  
 jsonb submission\_guidelines  
 jsonb academic\_integrity\_requirements  
 varchar feedback\_timeline  
 integer revision\_opportunities  
 boolean peer\_feedback\_component  
 boolean self\_evaluation\_component  
 integer career\_relevance  
 jsonb portfolio\_contribution  
 jsonb publication\_potential  
 timestamptz created\_at  
 timestamptz updated\_at  
 }  
  
 graduate\_assessment\_questions {  
 uuid question\_id PK  
 uuid assessment\_id FK  
 text question\_text  
 varchar question\_type  
 integer points\_possible  
 integer cognitive\_complexity  
 jsonb research\_skills\_assessed  
 jsonb theoretical\_knowledge\_required  
 text background\_context  
 text theoretical\_framework  
 text methodology\_considerations  
 jsonb evaluation\_criteria  
 jsonb exemplary\_response\_characteristics  
 jsonb common\_mistakes\_to\_avoid  
 jsonb required\_readings  
 jsonb supplementary\_resources  
 jsonb citation\_expectations  
 jsonb research\_methods\_application  
 jsonb data\_analysis\_requirements  
 jsonb ethical\_considerations  
 jsonb guiding\_questions  
 jsonb conceptual\_framework  
 jsonb suggested\_approach  
 jsonb writing\_style\_requirements  
 jsonb structure\_expectations  
 jsonb evidence\_requirements  
 decimal average\_score  
 decimal completion\_rate  
 integer time\_spent\_average  
 integer order\_index  
 boolean is\_active  
 timestamptz created\_at  
 timestamptz updated\_at  
 }  
  
 graduate\_thesis\_work {  
 uuid thesis\_id PK  
 uuid user\_id  
 uuid project\_id FK  
 varchar thesis\_title  
 graduate\_program\_type thesis\_type  
 research\_domain research\_domain  
 research\_methodology methodology  
 uuid primary\_advisor\_id  
 jsonb committee\_members  
 uuid external\_examiner\_id  
 integer total\_planned\_chapters  
 integer chapters\_completed  
 integer current\_chapter  
 integer word\_count\_current  
 integer word\_count\_target  
 date proposal\_defense\_date  
 date proposal\_approval\_date  
 date comprehensive\_exam\_date  
 date candidacy\_date  
 date thesis\_defense\_date  
 date final\_submission\_date  
 decimal literature\_review\_progress  
 decimal methodology\_section\_progress  
 decimal data\_collection\_progress  
 decimal analysis\_progress  
 decimal writing\_progress  
 decimal revision\_progress  
 integer academic\_writing\_quality  
 integer research\_rigor\_level  
 integer original\_contribution\_significance  
 integer methodology\_appropriateness  
 jsonb research\_questions  
 jsonb theoretical\_framework  
 jsonb key\_contributions  
 jsonb implications\_for\_field  
 jsonb limitations\_and\_constraints  
 jsonb future\_research\_directions  
 varchar advisor\_meetings\_frequency  
 jsonb committee\_feedback  
 jsonb peer\_review\_feedback  
 boolean writing\_center\_support  
 jsonb publication\_plans  
 jsonb conference\_presentation\_plans  
 jsonb potential\_impact\_assessment  
 jsonb media\_and\_outreach\_plans  
 varchar defense\_outcome  
 varchar final\_grade  
 jsonb committee\_recommendations  
 jsonb post\_defense\_revisions\_required  
 timestamptz created\_at  
 timestamptz updated\_at  
 }  
  
 %% Graduate Learning Progress & Analytics  
 graduate\_progress {  
 uuid progress\_id PK  
 uuid user\_id  
 uuid unit\_id FK  
 academic\_progress status  
 decimal completion\_percentage  
 integer academic\_mastery\_level  
 decimal total\_study\_hours  
 integer deep\_work\_sessions  
 decimal average\_session\_duration\_hours  
 integer optimal\_session\_duration  
 decimal reading\_completion\_rate  
 integer note\_taking\_quality  
 integer discussion\_participation\_level  
 integer critical\_thinking\_demonstration  
 integer literature\_review\_skills  
 integer methodology\_understanding  
 integer data\_analysis\_proficiency  
 integer academic\_writing\_improvement  
 integer theoretical\_understanding  
 integer practical\_application\_ability  
 integer synthesis\_and\_integration  
 integer original\_thinking\_development  
 integer peer\_collaboration\_engagement  
 boolean peer\_review\_participation  
 integer academic\_discussions\_contributed  
 integer knowledge\_sharing\_instances  
 boolean research\_project\_application  
 boolean thesis\_work\_integration  
 boolean publication\_potential\_identified  
 boolean conference\_presentation\_opportunity  
 integer subject\_matter\_confidence  
 integer research\_confidence  
 integer academic\_writing\_confidence  
 integer presentation\_confidence  
 integer procrastination\_level  
 integer time\_management\_effectiveness  
 decimal study\_schedule\_adherence  
 integer deadline\_management\_success  
 decimal reading\_goals\_met  
 integer writing\_milestones\_reached  
 integer research\_benchmarks\_achieved  
 integer learning\_objectives\_mastered  
 timestamptz first\_accessed\_at  
 timestamptz last\_accessed\_at  
 timestamptz completed\_at  
 timestamptz research\_applied\_at  
 text learning\_reflections  
 jsonb key\_insights  
 jsonb challenges\_encountered  
 jsonb breakthrough\_moments  
 jsonb follow\_up\_research\_interests  
 jsonb additional\_reading\_identified  
 jsonb skill\_development\_priorities  
 jsonb academic\_networking\_opportunities  
 timestamptz created\_at  
 timestamptz updated\_at  
 }  
  
 graduate\_skill\_development {  
 uuid development\_id PK  
 uuid user\_id  
 uuid skill\_id FK  
 integer current\_proficiency  
 integer target\_proficiency  
 jsonb proficiency\_trajectory  
 date learning\_start\_date  
 date target\_mastery\_date  
 date thesis\_application\_date  
 date research\_application\_date  
 date teaching\_application\_date  
 integer research\_projects\_applied  
 integer academic\_papers\_utilized  
 integer conference\_presentations\_featured  
 integer peer\_teaching\_instances  
 boolean advisor\_recognition  
 boolean peer\_acknowledgment  
 boolean conference\_feedback\_positive  
 boolean publication\_contribution  
 decimal formal\_coursework\_hours  
 decimal independent\_study\_hours  
 decimal research\_application\_hours  
 decimal peer\_collaboration\_hours  
 integer theoretical\_understanding  
 integer practical\_application\_ability  
 integer research\_methodology\_connection  
 integer teaching\_and\_explanation\_ability  
 integer thesis\_contribution\_significance  
 integer publication\_readiness\_level  
 integer academic\_career\_relevance  
 integer industry\_transferability  
 varchar primary\_learning\_context  
 jsonb mentor\_guidance\_received  
 jsonb peer\_learning\_contributions  
 integer conferences\_attended\_for\_skill  
 integer experts\_networked\_with  
 integer study\_groups\_participated  
 integer academic\_communities\_joined  
 jsonb current\_learning\_resources  
 jsonb advanced\_skill\_development\_plan  
 jsonb research\_application\_opportunities  
 jsonb teaching\_and\_mentoring\_plans  
 timestamptz created\_at  
 timestamptz updated\_at  
 }  
  
 graduate\_study\_sessions {  
 uuid session\_id PK  
 uuid user\_id  
 varchar session\_type  
 varchar academic\_focus  
 timestamptz started\_at  
 timestamptz ended\_at  
 integer planned\_duration\_hours  
 decimal actual\_duration\_hours  
 uuid units\_studied  
 jsonb readings\_completed  
 integer notes\_taken\_pages  
 jsonb concepts\_mastered  
 integer focus\_quality  
 integer comprehension\_self\_rating  
 integer productivity\_rating  
 integer academic\_satisfaction  
 boolean critical\_analysis\_performed  
 boolean original\_insights\_developed  
 boolean connections\_to\_research\_made  
 boolean thesis\_work\_advanced  
 varchar study\_location  
 boolean collaboration\_involved  
 integer peer\_discussion\_time\_minutes  
 boolean advisor\_consultation  
 jsonb difficulties\_encountered  
 jsonb support\_resources\_used  
 integer procrastination\_time\_minutes  
 integer interruption\_frequency  
 decimal learning\_objectives\_met  
 boolean breakthrough\_understanding  
 jsonb research\_questions\_generated  
 jsonb follow\_up\_actions\_identified  
 text session\_reflection  
 jsonb key\_takeaways  
 jsonb areas\_needing\_more\_work  
 jsonb next\_session\_planning  
 timestamptz created\_at  
 }  
  
 graduate\_performance\_analytics {  
 uuid analytics\_id PK  
 uuid user\_id  
 date analysis\_date  
 decimal overall\_gpa  
 integer courses\_completed  
 integer courses\_in\_progress  
 integer credit\_hours\_completed  
 decimal thesis\_progress\_percentage  
 integer research\_projects\_active  
 integer research\_milestones\_achieved  
 integer publications\_in\_progress  
 decimal average\_skill\_proficiency  
 integer research\_skills\_mastered  
 integer methodology\_competencies  
 decimal academic\_writing\_improvement  
 decimal weekly\_study\_hours  
 decimal deep\_work\_sessions\_per\_week  
 decimal average\_session\_focus\_quality  
 decimal time\_management\_effectiveness  
 integer peer\_collaboration\_frequency  
 integer academic\_discussion\_participation  
 integer conference\_attendance  
 integer networking\_events\_attended  
 integer papers\_submitted  
 integer presentations\_given  
 integer citations\_received  
 integer academic\_recognition\_events  
 integer professional\_skills\_developed  
 integer industry\_connections\_made  
 decimal job\_market\_preparation\_progress  
 integer career\_readiness\_score  
 decimal academic\_confidence\_average  
 decimal research\_confidence\_level  
 decimal thesis\_confidence\_rating  
 decimal overall\_program\_satisfaction  
 decimal learning\_efficiency\_rate  
 decimal research\_productivity\_score  
 decimal academic\_writing\_productivity  
 decimal career\_goal\_progress  
 jsonb skill\_development\_priorities  
 integer research\_direction\_clarity  
 integer post\_graduation\_preparation\_score  
 integer peer\_performance\_percentile  
 decimal program\_average\_comparison  
 decimal improvement\_rate  
 timestamptz created\_at  
 }  
  
 %% Semantic Search & Academic Intelligence  
 academic\_embedding\_models {  
 uuid model\_id PK  
 varchar model\_name UK  
 varchar provider  
 varchar model\_version  
 integer embedding\_dimensions  
 research\_domain research\_domains\_optimized  
 academic\_complexity academic\_levels\_supported  
 boolean scholarly\_content\_optimized  
 integer context\_window  
 decimal accuracy\_score  
 decimal academic\_precision\_score  
 boolean citation\_understanding  
 decimal theoretical\_content\_performance  
 decimal methodology\_content\_performance  
 decimal interdisciplinary\_capability  
 boolean is\_active  
 boolean is\_primary  
 jsonb computational\_requirements  
 timestamptz created\_at  
 }  
  
 academic\_content\_embeddings {  
 uuid embedding\_id PK  
 uuid content\_id FK  
 uuid model\_id FK  
 vector content\_vector  
 vector theoretical\_vector  
 vector methodological\_vector  
 vector disciplinary\_vector  
 vector citation\_context\_vector  
 vector research\_question\_vector  
 vector academic\_writing\_style\_vector  
 varchar content\_hash  
 integer token\_count  
 jsonb academic\_keywords  
 jsonb theoretical\_frameworks  
 jsonb methodology\_tags  
 decimal embedding\_quality\_score  
 decimal academic\_relevance\_score  
 decimal research\_applicability\_score  
 decimal theoretical\_depth\_score  
 integer search\_frequency  
 decimal academic\_match\_accuracy  
 decimal user\_relevance\_rating  
 decimal citation\_prediction\_accuracy  
 timestamptz created\_at  
 }  
  
 academic\_skill\_content\_mapping {  
 uuid mapping\_id PK  
 uuid content\_id FK  
 uuid skill\_id FK  
 decimal relevance\_score  
 decimal skill\_development\_contribution  
 decimal research\_application\_value  
 decimal theoretical\_foundation\_contribution  
 decimal methodology\_skill\_development  
 decimal critical\_thinking\_enhancement  
 decimal academic\_writing\_improvement  
 decimal thesis\_applicability  
 decimal publication\_preparation\_value  
 decimal conference\_presentation\_relevance  
 boolean introduces\_skill  
 boolean develops\_skill  
 boolean masters\_skill  
 boolean applies\_skill\_to\_research  
 boolean enables\_peer\_teaching  
 boolean requires\_deep\_study  
 decimal collaborative\_learning\_value  
 decimal independent\_research\_applicability  
 decimal academic\_career\_preparation  
 decimal industry\_transition\_value  
 decimal thought\_leadership\_potential  
 timestamptz created\_at  
 }  
  
 %% Graduate Analytics & Academic Performance  
 graduate\_learning\_analytics {  
 uuid analytics\_id PK  
 uuid user\_id  
 date analysis\_date  
 decimal daily\_study\_hours  
 integer deep\_work\_sessions  
 decimal average\_session\_duration  
 decimal academic\_focus\_quality  
 integer skills\_in\_development  
 integer skills\_research\_ready  
 integer skills\_thesis\_applied  
 integer skills\_publication\_ready  
 integer readings\_completed  
 integer academic\_discussions\_participated  
 integer peer\_collaborations  
 integer advisor\_consultations  
 integer research\_milestones\_achieved  
 integer thesis\_chapters\_progressed  
 integer literature\_review\_papers\_added  
 integer methodology\_development\_progress  
 integer academic\_writing\_pages  
 integer research\_notes\_created  
 integer critical\_analyses\_completed  
 integer presentations\_prepared  
 integer conferences\_attended  
 integer networking\_contacts\_made  
 integer publication\_submissions  
 integer peer\_review\_activities  
 decimal comprehension\_rate  
 decimal retention\_rate  
 decimal application\_success\_rate  
 decimal academic\_confidence\_level  
 decimal research\_confidence\_rating  
 decimal thesis\_progress\_satisfaction  
 integer procrastination\_incidents  
 decimal deadline\_adherence\_rate  
 decimal time\_allocation\_effectiveness  
 decimal study\_group\_participation  
 integer peer\_teaching\_instances  
 integer academic\_mentoring\_activities  
 integer department\_event\_attendance  
 integer citation\_potential\_score  
 integer academic\_recognition\_received  
 integer media\_attention\_events  
 integer industry\_collaboration\_contacts  
 timestamptz created\_at  
 }  
  
 academic\_credibility\_tracking {  
 uuid credibility\_id PK  
 uuid user\_id  
 date measurement\_date  
 credibility\_stage current\_credibility\_stage  
 decimal credibility\_score  
 jsonb credibility\_trajectory  
 integer publications\_count  
 integer citations\_received  
 integer h\_index  
 integer research\_projects\_completed  
 integer academic\_awards\_received  
 integer fellowships\_obtained  
 integer grants\_awarded  
 integer best\_paper\_awards  
 integer conferences\_presented\_at  
 integer keynote\_invitations  
 integer program\_committee\_memberships  
 integer peer\_review\_contributions  
 integer journal\_editorial\_roles  
 integer conference\_organizing\_roles  
 integer professional\_society\_memberships  
 integer academic\_collaborations  
 integer invited\_talks\_given  
 integer media\_appearances  
 integer blog\_posts\_published  
 integer social\_media\_academic\_influence  
 integer students\_mentored  
 integer courses\_taught  
 integer curriculum\_development\_contributions  
 integer educational\_innovation\_projects  
 integer industry\_collaborations  
 integer consulting\_projects  
 integer public\_speaking\_engagements  
 integer policy\_contributions  
 integer academic\_website\_quality  
 decimal orcid\_profile\_completeness  
 jsonb google\_scholar\_metrics  
 integer researchgate\_engagement  
 integer academic\_network\_size  
 integer international\_collaborators  
 integer cross\_disciplinary\_connections  
 integer industry\_professional\_contacts  
 integer research\_pipeline\_strength  
 integer collaboration\_opportunities\_identified  
 integer funding\_potential\_score  
 integer career\_advancement\_readiness  
 integer field\_contribution\_significance  
 integer interdisciplinary\_impact\_potential  
 integer societal\_impact\_score  
 integer innovation\_and\_creativity\_rating  
 timestamptz created\_at  
 }  
  
 academic\_development\_roi {  
 uuid roi\_id PK  
 uuid user\_id  
 date measurement\_date  
 decimal total\_study\_hours  
 decimal research\_hours  
 decimal networking\_hours  
 decimal writing\_and\_publication\_hours  
 integer degrees\_completed  
 integer publications\_authored  
 integer conferences\_presented  
 integer academic\_awards\_received  
 integer academic\_job\_offers  
 integer industry\_job\_offers  
 decimal salary\_increase\_percentage  
 integer career\_advancement\_level  
 integer academic\_network\_growth  
 integer industry\_connections\_made  
 integer mentorship\_relationships\_established  
 integer collaboration\_opportunities\_created  
 integer citation\_count\_growth  
 integer h\_index\_improvement  
 integer academic\_reputation\_score  
 integer thought\_leadership\_recognition  
 integer research\_projects\_led  
 integer grants\_obtained  
 integer patents\_filed  
 integer open\_source\_contributions  
 decimal total\_financial\_investment  
 decimal total\_financial\_return  
 decimal net\_financial\_roi  
 integer critical\_thinking\_improvement  
 integer research\_skills\_enhancement  
 integer academic\_writing\_development  
 integer leadership\_skills\_growth  
 integer academic\_career\_readiness  
 integer industry\_transition\_preparedness  
 integer entrepreneurial\_potential  
 integer consulting\_and\_advisory\_readiness  
 integer intellectual\_satisfaction\_rating  
 integer career\_confidence\_improvement  
 integer work\_life\_integration\_success  
 integer academic\_identity\_development  
 integer publication\_pipeline\_strength  
 integer research\_funding\_potential  
 integer academic\_leadership\_trajectory  
 integer field\_influence\_potential  
 timestamptz created\_at  
 }  
  
 %% RELATIONSHIPS %%  
   
 %% Core Profile & Research Management  
 graduate\_profiles ||--o{ research\_projects : "conducts"  
 graduate\_profiles ||--o{ academic\_publications : "authors"  
 graduate\_profiles ||--o{ conference\_participation : "attends"  
 graduate\_profiles ||--o{ graduate\_thesis\_work : "writes"  
 graduate\_profiles ||--o{ graduate\_progress : "tracks"  
 graduate\_profiles ||--o{ graduate\_skill\_development : "develops"  
 graduate\_profiles ||--o{ graduate\_study\_sessions : "conducts"  
 graduate\_profiles ||--o{ graduate\_performance\_analytics : "measures"  
 graduate\_profiles ||--o{ graduate\_learning\_analytics : "analyzes"  
 graduate\_profiles ||--o{ academic\_credibility\_tracking : "builds"  
 graduate\_profiles ||--o{ academic\_development\_roi : "evaluates"  
  
 research\_projects ||--o{ academic\_publications : "produces"  
 research\_projects ||--o{ graduate\_thesis\_work : "supports"  
 academic\_publications ||--o{ conference\_participation : "presents"  
  
 %% Graduate Curriculum Structure  
 graduate\_curricula ||--o{ graduate\_modules : "contains"  
 graduate\_modules ||--o{ graduate\_components : "includes"  
 graduate\_components ||--o{ graduate\_topics : "covers"  
 graduate\_topics ||--o{ graduate\_learning\_units : "comprises"  
 graduate\_learning\_units ||--o{ graduate\_content : "delivers"  
 graduate\_learning\_units ||--o{ graduate\_assessments : "evaluates"  
 graduate\_learning\_units ||--o{ graduate\_progress : "measures"  
  
 %% Academic Content Management  
 graduate\_content ||--o{ academic\_case\_studies : "includes"  
 graduate\_content ||--o{ academic\_resources : "references"  
 graduate\_content ||--o{ graduate\_avatar\_content : "adapts"  
 graduate\_content ||--o{ academic\_content\_embeddings : "embeds"  
 graduate\_content ||--o{ academic\_skill\_content\_mapping : "maps"  
  
 %% AI Avatar System  
 graduate\_ai\_avatars ||--o{ graduate\_avatar\_content : "customizes"  
  
 %% Assessment System  
 graduate\_assessments ||--o{ graduate\_assessment\_questions : "contains"  
  
 %% Academic Skills Development  
 academic\_skills ||--o{ graduate\_skill\_development : "develops"  
 academic\_skills ||--o{ academic\_skill\_content\_mapping : "connects"  
  
 %% Vector Search & Embeddings  
 academic\_embedding\_models ||--o{ academic\_content\_embeddings : "generates"

**Simplified Graduate Academic Excellence Flow**

erDiagram  
 %% Core Academic Excellence Flow  
 GRADUATE\_PROFILES ||--o{ RESEARCH\_PROJECTS : conducts  
 GRADUATE\_PROFILES ||--o{ ACADEMIC\_PUBLICATIONS : authors  
 GRADUATE\_PROFILES ||--o{ CONFERENCE\_PARTICIPATION : presents  
 GRADUATE\_PROFILES ||--o{ GRADUATE\_THESIS\_WORK : completes  
 GRADUATE\_PROFILES ||--o{ ACADEMIC\_CREDIBILITY\_TRACKING : builds  
   
 RESEARCH\_PROJECTS ||--o{ ACADEMIC\_PUBLICATIONS : produces  
 ACADEMIC\_PUBLICATIONS ||--o{ CONFERENCE\_PARTICIPATION : enables  
   
 GRADUATE\_CURRICULA ||--o{ GRADUATE\_MODULES : structures  
 GRADUATE\_MODULES ||--o{ GRADUATE\_LEARNING\_UNITS : delivers  
 GRADUATE\_LEARNING\_UNITS ||--o{ GRADUATE\_CONTENT : provides  
   
 ACADEMIC\_SKILLS ||--o{ GRADUATE\_SKILL\_DEVELOPMENT : develops  
 GRADUATE\_AI\_AVATARS ||--o{ GRADUATE\_AVATAR\_CONTENT : mentors  
   
 GRADUATE\_PROGRESS ||--|| GRADUATE\_LEARNING\_ANALYTICS : analyzes

**Credibility-Building Graduate Architecture Overview**

graph TB  
 subgraph "Graduate Profile & Research Management Layer"  
 A[graduate\_profiles] --> B[Research Identity]  
 C[research\_projects] --> D[Project Lifecycle]  
 E[academic\_publications] --> F[Publication Pipeline]  
 G[graduate\_thesis\_work] --> H[Thesis Management]  
 end  
   
 subgraph "Academic Credibility Building Layer"  
 I[academic\_credibility\_tracking] --> J[H-index & Citations]  
 K[conference\_participation] --> L[Academic Networking]  
 M[academic\_development\_roi] --> N[Career ROI Analysis]  
 end  
   
 subgraph "Graduate Curriculum & Learning Layer"  
 O[graduate\_curricula] --> P[Academic Structure]  
 Q[graduate\_modules] --> R[Course Organization]  
 S[graduate\_learning\_units] --> T[Learning Content]  
 U[graduate\_content] --> V[Scholarly Materials]  
 end  
   
 subgraph "Academic Skills & Development Layer"  
 W[academic\_skills] --> X[Skill Taxonomy]  
 Y[graduate\_skill\_development] --> Z[Mastery Tracking]  
 AA[graduate\_progress] --> BB[Academic Progress]  
 end  
   
 subgraph "Research Assessment & Evaluation Layer"  
 CC[graduate\_assessments] --> DD[Academic Rigor]  
 EE[graduate\_assessment\_questions] --> FF[Critical Analysis]  
 GG[graduate\_performance\_analytics] --> HH[Academic Analytics]  
 end  
   
 subgraph "Academic AI Mentorship Layer"  
 II[graduate\_ai\_avatars] --> JJ[Research Advisors]  
 KK[graduate\_avatar\_content] --> LL[Personalized Guidance]  
 end  
   
 subgraph "Academic Intelligence & Search Layer"  
 MM[academic\_embedding\_models] --> NN[Scholarly Search]  
 OO[academic\_content\_embeddings] --> PP[Research Discovery]  
 QQ[academic\_skill\_content\_mapping] --> RR[Learning Pathways]  
 end  
   
 subgraph "Research Analytics & Insights Layer"  
 SS[graduate\_learning\_analytics] --> TT[Learning Insights]  
 UU[graduate\_study\_sessions] --> VV[Study Analytics]  
 WW[academic\_case\_studies] --> XX[Research Examples]  
 end  
   
 %% Cross-layer connections  
 B --> J  
 D --> F  
 F --> L  
 P --> T  
 T --> V  
 X --> Z  
 Z --> BB  
 DD --> HH  
 JJ --> LL  
 NN --> PP  
 PP --> RR  
 TT --> VV  
   
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 style W fill:#f3e5f5  
 style CC fill:#e8f5e8  
 style II fill:#fce4ec  
 style MM fill:#f1f8e9  
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**Credibility-Building Graduate Key Features**

mindmap  
 root((Credibility-Building Graduate Platform))  
 Research Project Management  
 Multi-phase Lifecycle Tracking  
 Research Methodology Guidance  
 Publication Pipeline Management  
 Thesis Progress Monitoring  
 Academic Credibility Building  
 H-index Calculation  
 Citation Impact Tracking  
 Conference Participation  
 Academic Recognition  
 Publication Excellence  
 Manuscript Development  
 Journal Targeting  
 Peer Review Process  
 Citation Optimization  
 Graduate AI Mentorship  
 Research Advisors  
 Thesis Supervisors  
 Methodology Experts  
 Career Counselors  
 Academic Skill Development  
 Research Methods Mastery  
 Academic Writing Excellence  
 Statistical Analysis  
 Critical Thinking  
 Scholarly Analytics  
 Research Productivity  
 Academic ROI Analysis  
 Credibility Progression  
 Career Readiness  
 Academic Networking  
 Conference Connections  
 Research Collaboration  
 Professional Development  
 Industry Transition

**Graduate Academic Excellence Workflow**

flowchart TD  
 A[Graduate Profile Creation] --> B{Research Focus Selection}  
   
 B -->|Academic Track| C[Research Project Initiation]  
 B -->|Industry Track| D[Applied Research Planning]  
   
 C --> E[Literature Review Phase]  
 D --> E  
   
 E --> F[Methodology Development]  
 F --> G[Data Collection & Analysis]  
 G --> H[Manuscript Writing]  
   
 H --> I[Publication Submission]  
 H --> J[Thesis Development]  
   
 I --> K[Peer Review Process]  
 J --> L[Defense Preparation]  
   
 K --> M[Publication Success]  
 L --> N[Thesis Defense]  
   
 M --> O[Citation Impact Tracking]  
 N --> P[Graduate Completion]  
   
 O --> Q[Academic Credibility Building]  
 P --> Q  
   
 Q --> R{Career Path Decision}  
   
 R -->|Academic Career| S[Academic Job Market]  
 R -->|Industry Career| T[Industry Transition]  
 R -->|Entrepreneurship| U[Startup Launch]  
   
 S --> V[Academic Position Success]  
 T --> W[Industry Leadership Role]  
 U --> X[Innovation Success]  
   
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 style B fill:#fff3e0  
 style M fill:#e8f5e8  
 style N fill:#f3e5f5  
 style Q fill:#fce4ec  
 style V fill:#f1f8e9  
 style W fill:#fff8e1  
 style X fill:#e0f2f1

**Academic AI Avatar Specializations**

graph TB  
 subgraph "Graduate AI Avatar Ecosystem"  
 A[Dr. Elena Rodriguez - Research Advisor] --> A1[Research Methodology Design]  
 A --> A2[Project Management & Timeline]  
 A --> A3[Publication Strategy Development]  
   
 B[Prof. Michael Chen - Thesis Supervisor] --> B1[Thesis Structure & Writing]  
 B --> B2[Academic Argumentation]  
 B --> B3[Defense Preparation]  
   
 C[Dr. Sarah Thompson - Methodology Expert] --> C1[Research Design Validation]  
 C --> C2[Statistical Analysis Guidance]  
 C --> C3[Mixed Methods Expertise]  
   
 D[Prof. David Kim - Career Advisor] --> D1[Academic Job Market Prep]  
 D --> D2[Industry Transition Strategy]  
 D --> D3[Professional Network Building]  
 end  
   
 E[Graduate Student Needs] --> F[Personalized Mentorship]  
 F --> A  
 F --> B  
 F --> C  
 F --> D  
   
 G[Research Context] --> H[Adaptive Guidance]  
 H --> A  
 H --> B  
 H --> C  
 H --> D  
   
 style A fill:#e1f5fe  
 style B fill:#fff3e0  
 style C fill:#f3e5f5  
 style D fill:#e8f5e8

**Academic Research Success Pipeline**

gantt  
 title Graduate Academic Excellence Timeline  
 dateFormat YYYY-MM-DD  
 section Research Development  
 Literature Review :lit, 2024-01-01, 90d  
 Methodology Design :method, after lit, 60d  
 Data Collection :data, after method, 120d  
 Analysis Phase :analysis, after data, 90d  
   
 section Publication Pipeline  
 Manuscript Writing :manuscript, after analysis, 60d  
 Peer Review Process :review, after manuscript, 90d  
 Revision & Resubmission :revision, after review, 30d  
 Publication Success :publish, after revision, 30d  
   
 section Thesis Development  
 Thesis Writing :thesis, 2024-01-01, 365d  
 Committee Review :committee, after thesis, 30d  
 Defense Preparation :defense, after committee, 30d  
 Final Defense :final, after defense, 1d  
   
 section Career Preparation  
 Academic Job Market :jobmarket, 2024-09-01, 180d  
 Industry Networking :industry, 2024-06-01, 270d  
 Professional Development :professional, 2024-01-01, 365d